# STATES OF EMERGENCY

## Technological Failures and Social Destabilization

Patrick Lagadec

# Contents

# Introduction

In recent years, a whole series of technological breakdowns has considerably heightened the concern felt in our societies about major safety issues. From governments, public administrations and industrial groups to press organs, elected officials, unions, associations, and in the general public, we are all increasingly aware of the problem of major technological hazards - "three words", we wrote in 1980, "that raise innumerable technical questions, social issues, and particularly formidable challenges for political awareness and action in our time" (1).

## *After the warnings of the 1970s, the big shocks of the 1980s*

In writing *The Risk Civilization* (2), we focused on the simple warnings given during the 1970s by events like Seveso and Three Mile Island. Today, we know that the concept of major technological risk is more than just an intellectual framework:

- Mexico City, November 1984: explosions and a general fire producing a domino effect in a gas storage site located within a densely populated area. For hours, the firefighters couldn't get within a kilometer of the inferno. Gas reservoirs weighing several tons were transformed into missiles flying as much as 400 meters before crashing into the downtown area. Huge chunks of metal were projected more than two kilometers away. The toll: more than 800 immediate deaths (1000 - 2000 according to the press), more than 7000 severely wounded; 200,000 shock victims fled the area. A shadow was suddenly cast on the country's entire urban and industrial planning system, and Mexico was far from being the only country concerned by the problem

- Bhopal, December 1984: a cloud of toxic gas hits the capital of the Madhya Pradesh region. More than 2300 die, more than 60,000 are injured. America's third largest chemical group must fight for its survival. A hasty discussion develops over the utility of transferring industrial technology from North to South. The world's chemical industry is doubt-shaken, as its image

has been tarnished by fears similar to those plaguing the nuclear industry. Insurance companies make major strategic cutbacks (5) (6).

- Cape Canaveral, January 1986: Challenger, the space shuttle, explodes in flight and the team, its projects and symbols (including a teacher who was to give a lesson from space) die in a live broadcast watched by tens of millions of viewers. NASA falters under the shock, then is torn apart by the official investigation. The United States finds itself knocked out of space.

-Chernobyl, April 1986: a terrible nuclear incident occurs 130 miles outside Kiev and is revealed by Sweden. Few immediate deaths: a cloud drifts across all of Europe, reaching Greece and Turkey to the south, and crosses over the North Pole to touch Japan and the west coast of the United States. (Despite the barrage of declarations and the wall of silence erected, France is also affected.) This cloud unsettles numerous organizations lying in its path. A worldwide "shockwave" not only shakes the public's perception of this technology down to its roots, but also damages the image of public authority and experts as a whole.

-Basel, November 1986: in the aftermath of a chemical products warehouse fire, toxic chemicals flow into the Rhine. A chain reaction runs through all the countries touching the banks of this river, down to its mouth. This is the third major public emotion of the year. Confidence in technology and the credibility accorded to industry is further eroded, especially because of the company's delays in providing information.

## *Beyond the accident, the crisis*

In *The Risk Civilization* we laid out the many facets of this problem, ranging from accident prevention to dealing with catastrophe. Now we would like to look more closely at one of the moments in this vast ensemble: the shock itself, when the breakdown takes place, engendering extensive and deep disturbances. This examination is urgently necessary today, because two things have become clear: first, no matter what efforts are made in the area of prevention, the possibility of grave events persists; second, the processes that are unfailingly set in motion immediately after an acute breakdown are generally very poorly handled. From a breakdown, we regularly find ourselves slipping rapidly out of control and into crisis - which means, roughly speaking, a situation in which any corrective efforts made are hampered by a sense of confusion, helplessness, and aggravation.

Who has not been surprised to observe this annoying tendency our systems have of becoming gummed up as soon as an accident occurs - unless the incident is a most classic one, easily handled by the emergency services? Our tactical weapons are insufficient, our organizational structures too narrow, our business cultures fundamentally unadapted to dealing with the unforeseen, our fears camouflaged by rationalizations that crumble under the slightest pressure. We are poorly equipped to nip a crisis in the bud.

And what goes for major events like those mentioned above is equally true for simple alerts or accidents whose degree of gravity is incomparably smaller:

- October 1982 - June 1983: The case of the waste drums from Seveso, Italy, lost somewhere in Europe, made newspaper headlines for two months and destabilized Hoffmann-La Roche (and many other organizations) even more than the original accident that took place in 1976 (8).

-January-June 1985: The explosion of an Electricité de France (EDF) askarel transformer in Rheims, France revealed just how deeply ill-adapted large institutions are to handling exceptionally touchy situations. As an aside, it also indicated how financially costly such a major crisis management failure could be both in the short and long term (9) (10).

-August 1985: A small toxic gas leak from Union Carbide's Institute, Virginia plant (a sister of the Bhopal plant) led to brief hospital stays for approximately one hundred persons and, because the company had been slow to make public the information, unleashed a reaction that was (according to company spokesmen) more difficult to bring under control than the disturbance caused by Bhopal itself (11).

- July-August 1987: Mini-crises in Venezuela. Six months earlier, this country had imported some 6000 tons of meat from Europe. On June 30, in a completely distinct decision-making circuit, the standards for radioactivity levels were lowered from 1000 to 300 becquerels per kilo. On July 27, samples tested revealed levels of 710 becquerels. Once again officials became mired in the issue of standards, and the debate focused on the ignominy of wealthy nations. Just at the same time, a huge problem arose concerning 2500 tons of chemical waste imported from Italy. The products were far more toxic than foreseen in the contract, the drums were in a sorry state, health problems were mentioned in the press, and the authorities stepped into the fray. Once again, the situation became like quicksand - no one new how to prevent the crisis from worsening, let alone how to resolve it. The classic solution of putting the drums away on a military base, far from prying eyes, was adopted. But this didn't content the critics: water tables cannot be protected with barbed wire on the ground (13).

In short, whether the events are disasters destroying everything in their paths or simply somewhat unusual incidents, those involved respond predominantly by becoming paralyzed, incapable, or incoherent. No one knows what to do. Situations that were merely delicate are made unmanageable. Already latent negative images become graven in stone. And we sow dreaded seeds for the future.

## *Meeting the operational challenge, understanding the fundamental difficulties*

This framework is a standard source of discomfort for some and indignation for others. But why are we astonished that we stumble with such

remarkable regularity? When has anyone admitted a problem existed? When has anyone realized just how seriously our complex and sizable systems could be destabilized by post-accident crisis, and seen that we have to develop new approaches to managing them? This is not something we can turn over to the fire department or the paramedics. Have any training programs been offered to future leaders? And what lessons have been drawn from the past - especially from cases that were well handled by highly gifted and innovative officials?

Until recently, these questions were hardly even recognized, let alone studied. As Gerald C. Meyers, former chairman of American Motors notes, even thinking about the very possibility of failure is foreign to the manager's classic culture. "Most organizations are reluctant to prepare for adversity," he writes. "Leaders in my field find failure distasteful. (...) Every aggressive, successful person is conditioned to: think success; plan for success; allow no negative thinking; associate with positive people; emphasize accomplishment; and cast off losers." Citing the example of Harold Geneen, the legendary boss of ITT, Meyers writes, "Once you have set a business objective, you must achieve it. Those who fail to do so (...) are not simply poor managers; they are not managers at all" (14). In other words, in this view of management, taking an interest in crisis is tantamount to opting for a form of anti-management, or of drifting into a no man's land that should have no attraction for the responsible manager. Clearly some breaches have been carved in this attitude in the aftermath of the events mentioned above. But the organizations involved continue to be deeply imbibed with these beliefs.

Given this state of affairs, the precarity of the situation is hardly surprising, as was observed by the participants in the first international conference on industrial crisis management, organized in New York in September 1986 by the brand new Industrial Crisis Institute, which brings together scholars, consultants, industry leaders, and public officials.

- "Most corporations and government agencies, while acknowledging the inevitability of major crises, are ill-prepared to cope with them;
- There is an acute shortage of good case studies highlighting successful crisis management practices;
-There is little rigorous research or theoretical work addressing this critical area;
- There is a severe shortage of managerial tools and techniques for improving organizations' ability to prevent and cope with crises;
- There is no publication that provides managers, government agencies, and communities focused and comprehensive coverage of information on industrial crises and crisis management." (15).

Our purpose here is to take a closer look at the post-catastrophe or post-incident period, during which there is a strong tendency to overlay additional disturbances on top of the immediate problems. These new problems soon become autonomous and gel together to create crisis dynamics.

It is not hard to measure the need for technical, organizational, and socio-political reflection, if we are to avoid letting any breakdown cause a rout and drag us down inevitably. On one hand lie the major hazards, on the other, an enormous echo chamber for their repercussions: closely interdependent, vulnerable technical systems, management capacity that is often in its infancy, a lack of training for decision-makers, an often outdated organizational culture (especially as far as public communication is concerned), an essentially media-driven environment, and a public that both demands harsh truths and craves simplification - all this on top of a past history stained with resounding failures, especially in the field of communication. The basic diagnosis is clear: given the present state of habits and know-how, a serious incident has every chance of producing a chain of dreadful effects. By the same token, any limited accident that is somewhat out of the ordinary, or even a non-event (as we so often qualify an occurrence whose impact is purely symbolic) can engender severe disturbance and send us skidding out of control.

Knowing how much is at stake - in human terms (since these are situations that must be handled with exceptional competency) as well as in technological, economic, social, and cultural terms - we can't ignore the issue any longer. The whole question needs to be explored, operational recommendations must be outlined, and in-depth efforts undertaken.

How can we leave those in charge alone and practically unarmed on the front? The most pressing emergency is to provide decision-makers with the references and tools that are so cruelly lacking. Of course everyone wants to see these systems better managed, and to prevent them from slipping into confusion at the first sign of an unusual difficulty. But beyond that, in order to make sure these operational advances are achieved, we need to lay the groundwork for a better understanding of the fundamental problems. In particular, we have to recognize that conflicts and contrasting points of view also make crucial contributions to the crisis. This situation doesn't simply emerge as a result of little tactical errors - it plunges its roots into complex social settings that cannot be easily described.

The present work tries to respond to the expectations outlined above. It presents a set of experiences and landmarks for everyone, from the operations manager to the citizen, via all the different organizations involved. It does so by taking into consideration each of the actors, their problems, their visions of the world, their concerns, and how they operate. This is fundamental if we are to understand the multi-facetted dynamics that make the process of turbulence development a real and powerful one. This approach also places each of the actors within the more vast framework to which he or she belongs. As advocated by Graham Allison (16), the international crisis analyst acclaimed for his work on the Cuban missile crisis, it examines system organization and the forces that constitute the general terrain for crisis dynamics.

More generally, we will use the same backdrop as that developed in *The Risk Civilization:* a concern for operational issues; a certain audacity, without

which any real questioning is stifled before it can be heard; a scientific and technical integrity, necessitated by the complexity and the impact of the subject to be discussed; and an in-depth consideration of our major organizations, rarely equipped to meet these new and complex challenges - of how they work and what their very cultural basis is. We will also begin to look at questions and issues that are much harder to define: consistently swept under the rug, they reassert themselves forcefully when a major technical breakdown presents an occasion.

## *Can crises be "managed"?*

Any project has inherent limits and dangers, and this one is no exception to the rule. It was of course greeted enthusiastically, especially by thoses figures who one day had to face the storm alone.

But it is important to acknowledge the objections that are raised regularly about this kind of work :

1. It is useless: every situation is unique, so one person's experience is of no use to another.

2. The approach could be harmful to organizational development: because the systems will be better equipped, they may muffle crises that should be allowed to explode, since some situations can only be resolved through convulsion.

3. The effort is vain: anyone who knows how organizations work knows they couldn't care less about profound transformation. Don't expect anything beyond a short-term effort to get over the difficult moments and avoid making any substantial changes.

4. The project itself is unacceptable: it takes a typically conservative approach. True innovation comes through profound crisis and radical upheaval, which supply the levers necessary to change.

In reply, we should specify the following points:

1. Though every case is specific, they all nevertheless present constants that can be very effectively examined.

2. Our purpose is not to propose an emergency repair manual or a technique for circumventing the real issues. The temptation there is already too great, as Henry Kissinger reminds us: "In high office competing pressures tempt one to believe that an issue deferred is a problem avoided; more often it is a crisis invited" (17). And of course we can paraphrase Montesquieu's hypothesis in order to unveil the illusions of those who would confuse tackling crisis with performing magic tricks: if a social organization finds itself severely destabilized by an event, it is because the overall conditions existed to give that event a supreme destabilizing power. There can be no question here of attempting a merely superficial treatment.

3. There are many ways to justify the pessimism about the actual will and capacity to make changes. However, we think it possible to reply that at the very least, there are specific points for which improvements can be made.

Look for example at the magnificent account given by the specialists who have succeeded in inventing catastrophe medicine (18) and who have shown how pertinent persistently developed skills can be in handling situations like the terrorist attacks on Paris-Orly Airport in 1983 or on department stores in France and England in 1986, or numerous other catastrophes. Look how France's second PCB "scandal", striking the suburbs of Lyons in 1986, avoided so many of the pitfalls encountered in the first case, in Rheims (19) (20). Consider the successful response given by Johnson & Johnson in the United States (21), where thoughtful preparation saved the company from being overwhelmed by the Tylenol cyanide capsule menaces in 1982 (which nevertheless left seven dead, required the recall of 31 million bottles, and cost $100 million) and again in 1986 (with a death toll of one and the recall of millions more bottles at a cost of $150 million).

4. Finally, to strategic and philosophical objections, we would oppose our conviction that every-man-for-himself policies rarely stimulate progress for anyone whatsoever, and least of all for those who cherished the illusion that they would reap the primary benefits.

We have therefore chosen to pursue our goal of working for a better understanding and control of crisis phenomena - but we remain prudent, and we keep the above list of objections posted at Mission Control. Above all, the discussion must always remain open. After all, the purpose of seeking better control over crisis situations should not to encourage such madness to continue. Take the example of a megalopolis like Mexico City: five million inhabitants live without a sewer system, threatened with formidable public health problems; the levels of lead pollution in the air are so high that brain damage in children is a clear and present danger. As this extreme case shows, the priority should not be to pile up the safety systems, but rather to undertake fundamental structural transformations. The point is not to acquire magnificent resources that blockade us in dead ends. Crisis management can furnish a safety net against breakdowns. It must not become an alibi for untenable situations.

## *The first step: collecting and analyzing experience*

This book is first and foremost an investigation of experience: how did the people placed in charge of technological crisis situations react, and what did they learn?

This was the approach suggested by Richard Thornburgh, governor of Pennsylvania during the Three Mile Island crisis. At the New York conference mentioned earlier, the governor presented a day-by-day account of his own experience. Explaining why he had bothered to write this report, he was adamant: simply because he found himself alone, with no references, at a time when he had to confront the world's first significant failure in a nuclear power plant. His key phrase was, "... if one of my colleagues already had experienced a nuclear emergency like Three Mile Island, and had

recounted it in published form, such a publication would not long have lingered on my shelf" (22).

This book seeks to respond to that appeal. It is built around testimony we collected from high ranking officials who had been directly in charge of managing a crisis. But in order to broaden the terms of the discussion, we also spoke with other crisis actors, who have contributed their very concrete experiences as victims, journalists, scientific experts, consultants, union leaders, political leaders, or scholars. And to add an unorthodox voice to the mix, we include a militant social critic and fervent partisan of alternative lifestyles, at least insofar as the countries of the southern hemisphere are concerned.

The first voices ensure that we will not lose sight of operational and strategic necessities. The second group, that the urgency of taking action will not too hastily drown out the social complexity of any technological crisis situation.

With each interview, we pushed beyond the automatic responses and the facile remarks that characterize the discourse in any crisis situation. These interviews contain neither triumphant fanfare nor mediocre self-satisfaction, and even less of the false optimism which often seems to be de rigueur. (Though of course, the moment when the crisis hits is hardly a time for humble meditation.) Instead, we will see actors who respect crisis, who were its adversaries, and who applied all their intelligence and mental, social, and human capacities to fight it. Their tone seems rather to say, "What a powerful enemy that was! How resourceful! So much remains for us to do!" Only a frank approach, only interviewees of the highest quality could hope to attain such a profound level of analysis.

The main body of this work is preceded by an examination offering greater synthesis and highlighting some of the essential landmarks on the route along which crisis dynamics build their momentum. Such a framework of reference provides a wider context to the interviews presented in part two and makes them easier to understand. Finally, in part three, without pretending to develop an artificial synthesis of all these accounts, we will offer a few guidelines for action and for thought. These will emerge out of our expedition into the land of technologically-based crisis.

PART ONE

# *Technical Breakdown, Crisis and Destabilization*

## *Framework of Reference*

# 1. The weapons of crisis

It is brutal, insidious, tenacious, recurrent, and unyielding. Its onset may be terrifying or, to the contrary, like a wolf in sheep's clothing, it may disguise itself in an air of normalcy and slip through our lines of defense. Constantly opening up new fronts, it makes a mockery of meticulous order, wrenches apart smooth-running operations, and turns mercilessly on the heart of the system under attack. It has the means to knock its victims out quickly, but seems to prefer driving them to slow exhaustion. Breathing terror into the leadership, it triggers the sort of paralyzed reactions on which it feeds and grows. Some actors seem to welcome it with open arms and give it their full support: does it have allies within the ramparts ? Others claim they want to fight it, but everything they do amplifies its power - whom can we trust ? It overwhelms us and creates chaos before we have time to recognize and understand it. Already when it takes the stage, its victory seems assured, and it only withdraws once it has sowed the seeds of future disorder.

This is Crisis, the most widely feared complication of a technological accident. But what to do ? Crisis seems to withstand all our efforts and outstrip all our analyses. To attempt to find strategies for riposte, we must turn with humility to past experience. But these lessons cannot be extracted so easily. This is why it is important to begin by setting some guidelines for mapping what resembles an unruly battlefield. On this basis, it will then be possible to hear what experience has to say. We will look here at a summary of the essentials, as illustrated by a few brief examples.

## 1. An unusual event in a metastable context

Everyday experience offers a poor preparation for meeting the challenge of crisis. It accustoms us to breakdowns of little consequence, occurring in relatively stable and isolated environments. If these two conditions are fulfilled, no crisis will develop. The existing technical means are enough to absorb the incident without creating repercussions.

This is no longer the case with an unusual event that stands out from ordinary experience. Major accidents (or those perceived as such) are the very archetype of highly disturbing, extraordinary events. Serious turmoil may also be created if the event takes place in a metastable context, which is increasingly the case today: to extrapolate on the physical metaphor, a context appears stable, but the predominant conditions do not support this stability: it takes only the slightest external pressure to unsettle the whole system and let the instability spread.

### *The event*

Clearly the primary factor in a crisis is shock. It goes to work undermining the solid framework built on customary experience. Reference to habit makes it easy to imagine a scenario along the following lines:

- the scale and duration of the event are limited,
- the type of breakdown is familiar,
- codified emergency procedures exist,
- a limited number of parties are involved,
- the problem can be rapidly brought under control,
- in-house information is automatic,
- press releases can be drafted without difficulty,
- insurance coverage is guaranteed,
- economic impact is limited.

The major accident suddenly thrusts all the groups and organizations concerned into another world, throwing everyone off balance:

- large-scale risks appear,
- long-term problems develop,
- emergency procedures prove to be off-target,
- scientific technological uncertainty is severe and paralyzing,
- the number of actors to be dealt with grows exponentially and inexplicably,
- the critical phase is long, leading to exhaustion of people, systems and organizations,

- critical communications problems emerge:
  • within organizations
  • among different organizations
  • between organizations and the public, via the media.
- providing compensation threatens to be difficult,
- harsh conflicts develop among groups within a given society, among countries, or between influence zones (e.g. East-West or North-South divisions),
- economic, technological, and cultural stakes are extremely high.

Whether all these difficulties are present or only some of them, whether they strike immediately or remain threateningly dormant, they are terribly disruptive. Shaken by the event, the very foundations of social and economic organizations begin to tremble. To understand why, we need only list the main characteristics of major-accident situations (whether they are truly serious or simply perceived as such).

*The scale of the accident*

Contemporary hazards are now capable of producing catastrophes of a scale previously unimagined. It took just two events - San Juanico, Mexico and Bhopal - to pulverize earlier records for the number of victims caused by chemical accidents since World War IL A massive and explosive release of energy, a cloud of toxic gas, the pollution of a river (or any other distribution network) can strike out over great distances and with awesome force. Neither factory walls nor national borders preserve any significance. As we attempt to put such distances into perspective, Chernobyl has shown how large the scale can be.

*Duration of the phenomenon*

In this respect, two factors further sway our conventional frame of reference. On the one hand, the accident process - and it is no longer a simple equipment failure, but indeed a process - can last a long time (nine and a half months for the rupture of the Ixtoc 1 drilling rig that spilled 500,000 tons of crude oil into the Gulf of Mexico between June 3, 1979 and March 22, 1980). On the other hand, the effects of the breakdown may be felt over a period that can even surpass a generation. The first factor wears down available forces. The second introduces chronic difficulties such as long-term surveillance and gives rise to discussions about carcinogenic, mutagenic and teratogenic dangers. This was the cause of the most heated debates around the Seveso crisis. It also left its mark on Bhopal, and of course on Chernobyl. Consider, in the last case, the extreme disproportion between the number of immediate casualties (2 deaths) and short-term ones (less than 30) and the long-term potential (cancers in the region and all across Europe).

*Uncertainty: grasping for facts*

Data is generated at top speed, but it is hard to collect and interpret. An overwhelming snowball effect dominates the situation: even as more and more information floods in, growing doubts appear as the accident unfolds. The scenario typically takes this shape: we don't know exactly what products have been released; we don't know in what quantities; we cannot say how many people have been exposed to the substance; the effects on human beings are unknown; we have thresholds for long-term situations, but don't know what is acutely tolerated. With that, what basis is there for making immediate decisions? How can people be expected to wait days and weeks for laboratory analyses to be done? How much trust can we have in the results? What about apparently aberrant results? What do we make of the last-minute hypothesis that brutally alters all the accepted criteria? How do we single out the competent expert among the flock of specialists who inevitably appear on the doorstep? Chance, the exception, and calculated risk seem to replace of averages, rationales, and optimization.

Everyone remembers the problems that emerged at Seveso and Three Mile Island. And Bhopal was no exception: the effects on humans of the gas released into the atmosphere were poorly understood; no one knew, at least at the time, exactly what chemicals were involved; some even wondered whether the substance was modified by the leakage process or after inhalation by the victims. The result was a murky debate on the presence of cyanide-based compounds. We can sense how destabilizing such questions can be when the issue of water table contamination in a major urban agglomeration arises, as it did when a French electric utility transformer burned near Lyons on June 29 and 30, 1986, releasing 300 liters of PCB-loaded askarel into the ground.

The same issue of scientific uncertainty made press headlines when the *Mont Louis* sank on August 25, 1985, taking with it its cargo of uranium hexafluoride. The event was to arouse vigorous controversy: just what were the risks? Much time was needed before a clear and coherent view of the situation could be constructed.

> *The Mont Louis sinking and risks from drums of uranium hexafluoride:* in a dispatch dated August 26 (7:43 pm), Agence France Press (AFP) stated, "Uranium hexafluoride (UF6) is a highly toxic and extremely corrosive compound used to produce enriched uranium, the raw material of the nuclear power industry. UF6 is made highly corrosive by the presence of fluoride, the most aggressive element of this salt compound, and it therefore reacts strongly with most materials, especially in presence of hydrogen-based products, including water. When this substance is handled in nuclear power plants, the greatest care is used, and all humidity is avoided." Meanwhile the CEA (commission for atomic energy) spoke in terms of a gas (AFP dispatch at 6:48 pm the same day). Clearly the circumstances of the incident - non-nuclear, with primary responsibility falling on a shipper unaccustomed to crisis management, taking place outside the ship's home country on a Saturday - all contributed to internal communication problems in the official network. In particular, it was impossible at first to find the expert chemical specialists who could have explained that (1):
> - the steel containers, tested at 15 bars, were actually underpressured (0.1 bar),

- the hexafluoride was in solid and not gas form,
- though hydrolysis of UF6 is theoretically rapid, it is slow in practice, because the oxyfluoride prevents reception of the necessary water molecules,
- fluorohydrous acid is therefore released much more slowly than might be feared. Furthermore, being highly soluble, it dissolves in water, and is neutralized by seawater, which is alkaline.

On any one of these points, even a highly competent scientist who was not specifically versed in the question would have every chance of making a mistake, without realizing for a moment that the classic theoretical references were wrong. When this evaluation finally became available, several weeks after the shipwreck, it was too late to correct the general perception of the case by the public and the media (described in the following chapter).

### *Exponential growth of the number of actors*

We were used to seeing the head of the plant, the rescue teams, and local government representatives. Now such an event summons forth dozens of officials, agencies, organizations, laboratories, specialists, elected officials, and associations. Local issues become enmeshed in national and international ones. The world suddenly seems too big, and no one knows the rules of the game. The conventional networks and frameworks explode under the pressure.

At Bhopal, Union Carbide suddenly found itself having to deal simultaneously with the central Indian government, the Madhya Pradesh authorities, its Indian subsidiary, the world press, its other subsidiaries, its 100,000 employees, the governments of countries in which its group had plants, its stockholders, consumer associations, experts of all stripes, its clients, and armies of lawyers. Péter-J. Hargitay's experience (presented here in part two) illustrates the nature of the difficulties. As he noted, "There are some twenty languages in Europe, and I only speak seven."

With Chernobyl, the issue was no longer a reactor and its neighbors, but Chernobyl, Kiev, Moscow, Sweden, Italy, Germany, France, California, and on around the globe.

Similar reactions come into play in cases of infinitely less gravity. In the case of the forty-one waste drums from Seveso, all it took was an article in the popular French magazine *Science et Vie* to throw some forty organizations and six countries into the spotlight. Here again, the splash was impressive.

### *Riding a media tidal wave*

Even in the best cases, emergency plans provide procedures for prudently announcing delicate information. But here, the top blows off the kettle. The press may know about an event before the official spokesperson does, while the news reaches company headquarters in a radio flash. Everything combines to make the media primary players in an exceptional situation: CB scanner radios that give them fast, first-hand information; their flair for unusual events (which can send them off on a trail while officials are still wondering

whether they should be getting worried); their astounding capacity for unearthing information; and their sometimes fantastic technical resources (including undercover cars, helicopters, and satellites). Just as the situation's unsteadiness becomes general, hordes of journalists begin pouring in and demanding fast, precise, and vital information - and the more serious, slippery, and explosive the situation is, the more they want.

The case of Three Mile Island remains a subject of meditation for those who might doubt the media's power. Bhopal and the Challenger accident highlight how incisive the pressure is from a press organized on a global scale and fully aware of what the notion of an exceptional event means. In the former case, the world's thirty-seventh largest company had to admit that it could in no way rival information networks stretching around the world. In the latter, NASA, the best equipped organization in the world for facing media pressure, was totally overcome by the waves of journalists.

> *Three Mile Island (TMI):* As early as 8 am in the morning, a journalist following police and fire department CB radio broadcasts picked up a high level of activity relating to the plant. As soon as his boss got wind of it, he called TMI and by error was connected with the control room, where he was told, "I can't talk now, we've got a problem." A Harrisburg music station broke the story on its 8:25 am newscast At 9:06 am, Associated Press filed its first story (2). The media continued to show their prowess by gathering license plate numbers of cars parked at the plant. Journalists then hunted down employees and tried to glean information from them (3 a). Better yet, one patient reporter managed to find the radio frequency being used by officials: "Parked directly across the Susquehanna from the plant, Nordland tooled with his fancy scanner radio searching for TMI transmissions. Nothing on the utility band, nor the police band. He switched to a frequency the instruction booklet said was reserved for 'federal interagency cooperation during nuclear war.' And they were there" (3 b).
> *Bhopal:* The telephone rings at Union Carbide Headquarters in Danbury, Connecticut at 4:30 am. CBS News is on the phone wanting to talk to somebody about an accident in Bhopal. The media relations manager is suddenly plunged into the media event: "They had a wire service report out of India that said there was a gas leak and a few people had been killed," he recalled. "At the time the guy said 30 to 35. He started giving me all of the details, including the cows that were lying dead in the streets. As I talked to him, he kept getting more reports. By the time I got off the phone the death count he had was up to 200 to 300 people" (4 a).
> *Challenger:* As NASA's director of public affairs recalls, "I don't know how that many people could have appeared from almost nowhere in so short a time (...)• We had 400 to 500 newspeople credentialed for the launch, and most of those were photographers. By nightfall 800 more had come. By the next day we had 1400 to 1500 members of the press. It was wall-to-wall people" (4 b).

### *Playing for huge stakes*

The breakdown casts a shadow of doubt on technological developments, far-reaching interests, and huge, carefully balanced systems. Be it nuclear energy, chemicals, technology transfer, the world insurance market, urban planning policies, or lifestyles, everyone very quickly begins to feel the threat of seeing their situations re-evaluated too hastily in the midst of chaos. Bhopal

created this kind of setting: Union Carbide was fighting to survive; the chemical industry worldwide suffered a deep blow to its public image in the light of the terrifying catastrophe; multinationals in general saw a resurgence of the typical attacks launched against them; and a particularly stressful North-South dialogue opened up.

## *The context*

As we have seen, it doesn't require a veritable major catastrophe to set this scenario in motion. The crux of the issue lies in the relationship between the intrinsic force of the event and the potential instability of the context in which it takes place. This is why it is worth looking at the many footholds a crisis finds in the accident environment. These can be defined at several analytical levels.

### *The immediate framework of the accident*

Numerous crisis factors fall into this category. The breakdown need only:

- elicit, for one reason or another, descriptions connected with keywords or expressions like nuclear, dioxin, chemical warfare, epidemic, water table, toxic waste, or potable water supply,
- not lend itself to being completely circumscribed in a given space or time period,
- threaten vulnerable groups such as children or pregnant women,
- be the latest accident in a series, even if it isn't the most serious,
- or prove the blatant falsehood of prior official assurances (or seem to do so).

By the same token, if:

- no one "guilty party" can be pinpointed,
- no official service seems to be in charge of this type of problem,
- those placed in charge are unable to speak with a minimum of authority about the situation, or seem unwilling to communicate,
- Science cannot provide an on-the-spot, simple, unequivocal, and reassuring explanation of the situation,
- conflicts develop between the major actors in the event,
- specific local issues add to the complexity of the event,
- various coincidences lead to unfavorable circumstances, then the crisis is off and running.

The case of the sinking of the *Tanio,* in and of itself a minor accident, reveals very well how the intrinsic gravity of a failure is only one element among many in the development of a post-accident crisis.

> *The Tanio:* After the first shock of the *Torrey Canyon* in 1967 and the monumental *Amoco Cadiz* spill in 1978, the Britanny region of France was hit by another oil slick in 1980. This case reached the brink of crisis. The event in and of itself, involving

8000 tons of oil versus 220,000 was nowhere as brutal as the 1978 spill. But all the ingredients were there to trigger a crisis:
- the Tanio was the sixth oil tanker to pollute the Breton coast,
- the indemnity claims filed in the Amaco Cadiz case had not yet been settled,
-local officials had to ask Paris to push the government's local representative to action,
- high-ranking state officials were in no hurry to visit one more oil slick, and the national *paper Le Monde* titled, "Let's not get worked up" on a front page story listing the dozen government figures who were implicated but were inexplicably unavailable,
- part of the wreck lay 87 meters deep, and the thousands of tons of oil still contained there posed a serious threat,
- the type of oil spilled was especially difficult to clean up on land,
- cracks in the hull were found that had been patched with cement,
- it was impossible to locate those responsible: "Just who owns the *Tanio?"* titled *Le Monde* on its revelation of the tortuous search for the ship's owners.

All that was missing was the spark to light the fuse on this powder keg. It came during a demonstration in Paris of elected officials and inhabitants of the region, which soured when the President of the Republic refused to meet personally with their delegation. The leitmotiv running through the local press after the bitter trainride home was, "We went there as French, we return home Bretons". And the situation began to fester as a split developed between the region and the government. Communal administrations went on strike, Bretons refused to cooperate any longer in the clean-up work, restaurants feeding soldiers participating in the clean-up closed their doors. In the background hovered the ever-present issue of regional separatism (5).

This case and the last of its characteristics - a regional issue that threatened to become a sounding board for the accident - are worth examining in greater detail.

*A wider context ready to explode*

Beyond the immediate consequences of each type of breakdown, we should wonder about its particular structural context. Several points need to be considered:

- How is the field involved in the accident generally perceived?
- How great is the stock of legitimacy and credibility of the actors involved?
- What tone and what communications practices have been used in handling prior incidents?

There is no denying that the room for manœuvre in managing any post-accidental situation today is tight. The legacy of the past weighs heavily. The public now knows that major hazards are a reality. It knows science offers no absolute certitudes, but rather is socially conditioned. Consequently, every result (or lack thereof - sometimes actors seek to avoid undertaking tests) must be examined closely. The public also knows that until recently, the first reflex in a breakdown was dissimulation, even for accidents of limited impact. This means citizens are often suspicious from the outset, and their suspicion deepens at the slightest sign of incoherency and is confirmed by the least hint of a cover-up. One false step in communicating can quickly lead to

wholesale condemnation, thus ensuring the rapid disintegration of any post-accidental situation.

All this creates a context that is ready to explode. The case of the electric transformer fire in Villeurbanne, France near Lyons was a fine example. This case is full of very interesting lessons and will be examined later in greater detail. The actors involved in it were exceptionally qualified, able to exercise self-criticism and adjust rapidly (even if after the fact, the issue of their potential over-reaction was raised).

> *Cusset-Villeurbanne:* Just after the accident, the tone adopted was reassuring: the 300 liters of PCB-laden askarel had been captured by the built-in retention basin. But when the basin leaked, these assurances proved to be ill-founded. The operator had the honesty and the courage to admit very quickly that he had been wrong - a first - but the context was even more eloquent. The riposte came immediately, and its intensity had much to say about the general atmosphere created by a technological failure. The ingrained defiance that would have to be dealt with in the future radiated from the conclusion this July 4, 1986 *Liberation* editorial:
> "Of course, as they always do in this type of business, EDF and other officials, as well as the ministries in charge of such issues, have been overwhelmed by events. Why? Because they were happy to look the other way when operators took the liberty of installing PCB transformers without retention systems that could be counted on to prevent any leakage of the substance into the ground. Because they underestimated the chances of an accident. Because they lied when they said the floor of the transformer was leak-proof. Because they fooled themselves and everyone else into believing the danger was past as soon as the fire was out. Because they still don't know today the exact magnitude of the leaks, or their long-term consequences. And simply because askarel and PCBs are being tested, not in the laboratory, but *in vivo* in the suburbs of Lyons, on guinea pigs who would have said no if they could."

Such a context can be corrected, but that takes serious efforts. For one thing, habits are hard to break. For another, once they are broken, it is difficult to spread the word that a change has occurred. Hoffmann-La Roche learned this the hard way through its experience with the Seveso waste drums. The firm, which was built around a tradition of secrecy, had certainly striven to develop a more open corporate culture. But when the crisis hit, these efforts were trampled. The general reaction was, "That's Hoffmann-La Roche for you!" One official cited an Austrian expression to this author, saying, "Our past has caught up with us".

And the past can be a heavy burden. What statements or intimations have been made about the absence of any risk? Openness is very recent in corporate policy. As a result, serious reticences remain, doubtless rooted in turn in deeper apprehensions. After Three Mile Island, an EDF-Louis Harris poll indicated that 80% of French citizens living near a nuclear power plant believed that "if an accident happens in France, the public won't be told the truth," and 61% felt "such an accident may already have taken place, but pains were taken to keep it a secret" (6).

The public communications problems encountered in France during Chernobyl could only reinforce these fears (Translator's note: The early official line suggested that the radioactive cloud had stopped at the Franco-German border). In the light of revelations made on a May 10, 1986 televised debate between Monique Séné, president of the association of scientists for nuclear energy information, and Dr. Pellerin. director of the central service for protection against ionizing radiation, the press headlines were unanimous, ranging from "Radioactive Lies" to "The Truth on Radioactive Contamination in France" to "What the Experts Aren't Telling You".

In short, the backdrop was hyper-allergenic. Post-Chernobyl polls on the subject are telling. Consider simply the results Gallup published in the weekly magazine *L'Express* on October 24, 1986: "Have you been told the truth?" Answer: 79% "no". "Are the technicians telling the truth?" Answer: 64% "no". The press feels it need look no further for its headers. The public expects things to be hushed up, covered up and circumscribed. And what goes for nuclear energy goes for the chemical industry as well, after the Sandoz experience in Basel - when an international chorus of voices was raised, scandalized by the delays in providing information.[1]

To complicate an already loaded picture, we should note that the press is capable of creating problems of its own. The announcement by an American press agency of 2000 deaths following the Chernobyl catastrophe was just one example. Such announcements can have a devastating impact. Of course, as with the other components of context, we mustn't oversimplify. The system does have some internal regulation, and the media do not enjoy de facto credibility, as the same post-Chernobyl poll indicated: "Are the journalists telling the truth?" Answer: 61% "no". But the overall picture is troubling, all the more so because other, equally hard to manage developments have now biased society's perceptions of technology, safety, and authority.

### *Ponderous social trends*

Citizens no longer have blind faith in Science. They no longer find Progress a self-sufficient argument. They no longer grant unlimited credibility to their officials. And they look twice before recognizing anyone as a legitimate authority, even for a short period and on a specific point.

Events like Chernobyl have proven that the borders which used to protect authority are in fact flimsy lines of defense. A government is no longer master of its own house - foreign officials have become potential competitors. Even the most prestigious scientific laboratory no longer automatically commands public respect. Its results are promptly compared to other sources. If no comparison is available, then suspicion sets in. Information, diagnosis, and decision-making have become markets, and the citizen is the consumer. Major private corporations concerned with external

1. Sandoz has since proven its ability to correct this situation. By taking exceptional initiatives, it has rebuilt its public image. This makes this case all the more interesting for other large industrial groups.

appearances are capable of requesting second opinions from foreign labs, of publishing their own results, and of making decisions that run counter to those of public authorities - and this means they create a serious potential for destabilization (consider the problem of stopping or destroying production of an item as soon as contamination is rumored, even if the applicable thresholds are being respected). Large media groups can also undertake destabilizing initiatives.

In short, the old scenario that functioned according to a pyramidal hierarchy, in which legitimacy was derived from and reinforced by institutional status, and credibility came on the tails of prestige, no longer applies. Those who try to make it work simply precipitate their own fall. We now live in societies where legitimacy and credibility are limited resources for which there is serious competition. They are not accorded outright, but are allocated on the basis of previous performance, subject to renewal after consideration of comparable results. This social contract is immediately revoked if the slightest official incompetence can be suspected (and a breakdown is evidence for conviction), if powers have been abused (and adopting technical options that include elements of major risk would certainly be considered by some as an abuse of power), or if communication has been blocked (which is the basic assumption). Clearly, it is very difficult to navigate in a post-accidental situation through such a minefield.

## 2. Crisis Dynamics

By necessity, we have examined individually the difficulties that can be raised by a technological breakdown. But in reality, a crisis is dynamic, combining all these factors. However, it does seem to move along three major axes:

- Difficulties come in waves: no one can resist the avalanche of problems to be solved or information to be distributed.
- Organizational procedures and systems become disordered: the mechanisms stop working or, worse yet, begin to backfire.
- The purpose, goals, and fundamental structures of the system and its subsystems are called into doubt: the life of the organization in question is suddenly riven by divisions.

Waves of difficulties and disorder make players fragile and impotent. The fundamental questioning is destabilizing, and it is made all the more acute and powerful because the other two aspects have already shaken the system. Crisis dynamics are the summation of these three processes.

The difficulties pile up. The battle must be fought over the long run, but at top speed as well. All sorts of protections suddenly prove to be cruel illusions. Sources of support fall away, and the system or systems begin to resonate dangerously. Actions taken to stabilize the situation are counteracted

by paradoxical or perverse effects. As the systems are coming under attack from an external event, they begin to crumble from within: response mechanisms seize up, deviations seem to increase instead of triggering the self-adjusting phenomena that would normally come into play, latent antagonism comes out into the open, and manifestly complementary forces are dissociated. A game of shifting alliances sets in, conflicts deepen, and an increasing number of contradictory demands must all be met at once. And the procession of miracles (or wishful thinking about them) begins: wonder techniques, heaven-sent leaders, and scapegoats all march through people's minds and across the stage. Nor can we avoid looking for the plot or the secret ringleader. (This tendency becomes inevitable if the slightest fact justifies the possibility of such machinations, and a crisis is never fully exempt from dubious manœuvres, even if only on its secondary fronts and from the most marginal actors.)

The combination of all these phenomena releases destabilizing dynamics that are very difficult to control, especially when an organization is neither psychologically nor practically prepared to anticipate and confront this type of strong perturbation. "All these things overlap, criss-cross, conflict, and combine with each other", writes Edgar Morin, who emphasizes, "The development and the outcome of a crisis are uncertain not only because disorder progresses, but also because all these extremely rich forces, processes and phenomena influence and destroy each other within the disorder" (7). Reason seems powerless in the face of these burgeoning elements and their apparently random combination. In order to cope, a comprehensive response must be developed that mobilizes a network of organizations, under the firm direction of closely collaborating leadership staffs that are especially attentive to issues involving public communications. This takes technicians and specialists who are prepared to play a tough role in this information area. Such capacities must have been developed long before the crisis strikes.

Because such is generally not the case, the scenarios we usually can see unfolding only serve to aggravate the situation further. As if it were in quicksand, the organization (and more broadly all the systems involved) slip in deeper and deeper, and every movement (which is not part of a more comprehensive response) thrusts it further and faster into increasing difficulties.

Here again, we can pursue this analysis and fill out the frame of reference by taking the point of view, not of the crisis, but of those who see it rushing over them.

# 2. Organizations with their backs to the wall

Most commonly, the crisis comes as a surprise. It is there before anyone, including the most directly implicated officials, notice it. Too late and too brutally, each organization realizes it has been plunged into a situation that is delicate, to say the least:

- The organization faces very serious problems that it finds overwhelming,
- It is under heavy pressure from the outside,
- It is torn by violent internal strife,
- There is no respite to deal with these problems one by one - to the contrary, the organization finds itself planted squarely and durably in the spotlight and summoned to communicate perfectly during what is the most trying moment in its history,
- It also finds itself set up against other organizations, which are in the same state of disarray.

The technicians can offer no immediate answers. Managers no longer know what orders to give, public relations officials watch their plans crumble, and headquarters don't know exactly when or where they should intervene - meanwhile, unrelenting pressure on the organization, and on the system of organizations implicated, is building.

When under siege, organizations often tend to stumble into a briar patch, and they proceed to become more and more deeply entangled, until their situation becomes untenable.

## 1. Classic destabilization scenarios

### *The cost of not being prepared*

Even before a crisis appears, a system is already vulnerable if it is unsufficiently prepared. Important breaches in the defense network may exist which accentuate this vulnerability and, even more seriously, which may sap morale as the actors discover how profoundly unadapted their defenses were[1].

Weaknesses like these suddenly come to light:

- There is no emergency plan, or more generally, the available plans have not been re-evaluated, tested (they only work on paper), or discussed with the outside agencies involved (this is the most frequent failing),
- At a deeper level, no past initiative has been taken to think seriously about the problem of potential crises. Often, whenever the question does manage to be posed in an undeniable way, it is placed in the hands of a sub-committee, without being listed among the organization's strategic preoccupations. With that, it becomes perfectly clear to everyone just how little importance top management accords to the issue, and the corresponding conclusions about individual priorities follow accordingly,
- With these givens, no one has developed a specific capacity for thinking about crisis scenarios and dealing with uncertainty. No one has developed a policy for continuous communication - which greatly jeopardizes attempts at informing and dialoguing when the crisis arrives and innovation becomes particularly unlikely.

In short, the crisis runs into a rigid system poorly adapted to coping with severe disruptions. This system has a normal tendency to freeze up even further, which only serves to intensify the force of the crisis.

Furthermore, this absence of preparedness can eventually be publicly revealed, setting off serious Shockwaves even when there is no breakdown. This is what happened with the Union Carbide plant at Institute, Virginia, which of course attracted especially intense media attention after the Bhopal accident.

> *Newsweek and the Institute plant:*
>
> Throughout the American media, the question was, "Can it happen here?" When Newsweek investigated the emergency information given to neighbors of Bhopal's sister plant, it found: "... many residents said they had no idea what to do in case of an

1. To draw an illustration from another field, we can consider a tragic episode dating from 1940. On the body of an officer who had just committed suicide was found a postcard addressed to the president of the French cabinet. It said, "I am killing myself to let you know, Mr President, that all my men were brave, but that you don" t send people to fight assault tanks with rifles!" (J. Benoist-Méchin, *Soixante jours qui ébranlèrent l'Occident*, May 10-July 10, 1940, Laffont, Paris, 1981, p. 156).

accident - nor had many seen a letter that plant spokesmen claimed was sent to residents every year since 1975 outlining the plant's emergency programs." To top things off, the magazine added, "If they had, they might still be confused. According to the letter, two three-second blasts of the plant's whistle means a fire or medical emergency; three three-second blasts means a gas release; two-second blasts every three seconds for two minutes means a major disaster, with two-second blasts every 30 seconds until the danger has passed... Instructions for what to do next are equally confusing: if the wind is blowing favorably, stay put. If the wind is blowing toward you from the plant, evacuate 'by going crosswind'. 'In some cases, you can see the fumes as a white cloud', the letter added. 'However, this is not always the case so don't depend on your eyes'." (1)

### *The sudden event and the state of shock*

A major incident can veer sharply into unimaginable and supposedly impossible scenarios. Mexico City went into shock on November 19, 1984, because of an eery light over northern barrios, a tremor felt in a radius of more than 20 kilometers, a blaze so hot it rendered the area inaccessible, fears that all the gas storage tanks would blow, and an anguished vision of a domino effect rushing through all the installations in the area and widening the catastrophe. Meanwhile, terrible news spread of the cost in human lives and the chaos reigning in the area. Who wouldn't be thrown by the sheer scale of the disaster? Bhopal's 2000 dead also inevitably plunged Union Carbide into a state of shock, especially in the light of the cascade of problems that rained down on the company: it was impossible to get information (Indian authorities blocked all contact between the company's headquarters and the Indian subsidiary); the company's president was arrested upon arriving in India; there were fears of corporate collapse. In the Challenger accident, the shock took an even more destabilizing form in the media world, where noise is the norm: suddenly, the loud-speakers went off. Silence was the response to incomprehension.

This state of shock may even be felt during simulation drills (which suggests the force of the phenomenon when the disaster is real). This was observed in an exercise organized in Lyons, France on April 2, 1982, by highly aware and responsible authorities. The theme of this drill for decision-markers was a toxicological accident in an urban area. The danger level was perceived to be too high, and the actors were "in consternation" over the gravity of the event.

*Lyons exercise, April 2, 1982:* According to the scenario, the event was a transportation accident causing the release of 26 tons of a toxic substance within 30 minutes. Half an hour after the accident, several zones could be observed: a mortal zone 3 kilometers long and 300 meters wide; a debilitating zone 5 kilometers long and 500 meters wide; an irritation zone, more than 10 kilometers long and between 800 meters and 2 kilometers wide. These respective areas contained 6200, 11,900, and more than 30,000 persons. The central lesson of the drill was, "Faced with a situation of this amplitude, seeing the disaster spreading rapidly, the actors were disconcerted.

> The existing operational plans... seemed ridiculous. The readily available organic resources and reinforcements (i.e. the Army) also appeared completely out of scale with the measures that needed to be taken. No satisfactory strategy could be designed to control the consequences of a toxicological accident of this degree. The most important lesson dealt with fighting a situation so serious that it could only be handled with crisis measures" (2).

## *The Crisis with a slow fuse: Rampant inattention*

In this area, one factor is constant: a long delay in detecting the problem and recognizing its (effective or perceived) magnitude. Abnormal situations go unnoticed, or are viewed through the filter of habit and considered to have been seen before, and are not considered worthy of special precautions or steps. This is what Wanner and Nicolet (3) refer to as a representational error, and its prevalence increases as the facts become more troubling. Questions are pushed aside until they become blindingly and cripplingly evident and can no longer be ignored. This process sharply reinforces incomprehension between the agency in charge and outside observers, especially those like the press, whose very job is to identify exceptional events.

This line of reaction, typified by a time warp between facts occurring and their being dealt with, may persist long after the initial phase of the crisis and provoke systematic strategic errors, badly timed actions, and highly counter-productive or even "suicidal" official stances.

A medical analogy fits well into this scenario. The reactions of an organization encoutering a difficult event are like those of a patient learning he or she is gravely ill. For the organization, the outline seems to go through four phases: shock, defensive retreat, recognition, and adaptation and change (4). This is a troubling progression, because it is during the initial phases that the organization has the greatest room for manœuvre and can intervene most effectively. Consider the case of the PCB transformer fire in Rheims, France (examined in detail later in the interview with Karine Robak): the first protective measures were taken only after the officials had lost all credibility and there were not dozens but hundreds of people requiring medical surveillance (many persons had visited the building during the three months when the case was an official non-issue). This was a public health problem of a totally different scale.

## *A series of negative reactions*

### *Internal information on a slow track*

One primary mechanism does not help information move rapidly up through the hierarchy. First, the agents directly in charge of the problem hesitate and dillydally, because it is actually not easy to get a clear

appreciation of the phenomena in progress. Typical questions raised at this stage (especially at night or during the weekend) are: "Should we bother the safety manager?", "Should we warn the executive office?". Along the same lines, traditional organizational lethargy must be taken into account. If it weren't complex, a large-scale system could not function; but because it is so, information takes time to reach its destination. Otherwise the system must be short-circuited, which cannot be a general operating procedure, because of the risk of creating bottlenecks and disorder. Of course the discerning organization member can work around this barrier. But other mechanisms, of a psychological nature, then come into play.

When confronted with ambiguous or blatantly frightening realities, systems seize up. The slowest, most molasses-like movement is to be found just where snappy reactions are called for. As a rule, the more troubling the data is, the farther it is from established norms, the slower and foggier its transmission will be. If it is passed on pro forma, it will not be done so efficiently. The classic example is signaling an alert or a key piece of information to a subordinate figure when it should be sent directly to a top manager. The most deeply ingrained habit giving rise to problems of this sort is the tendency to stimulate each organizational level to "reassure" the levels above it. In 1976, as a result of such behavior, the chairman of Hoffmann-La Roche was only called home from a business trip in the United States after the Seveso accident had already made the headlines in all the European media. It was too late.

### *Isolation from the outside world*

An exceptional situation cries out for establishing very broad networks, but the opposite is what happens. The organization pulls in on itself, cutting itself off from the outside world and even its most regularly used networks. The Taft chemical explosion is a fine example of this.

> *Taft (Louisiana):* around 11:00 pm on Friday, December 10, 1982, plant officials had become sufficiently concerned to evacuate employees from a portion of the plant... There was an overheating problem with one of their tanks containing acrolein (a highly volatile chemical). Local emergency organizations in this chemical producing region were well-equipped to handle such emergencies, but were not contacted by plant officials. The sheriffs office started to receive calls from individual citizens asking about evacuation routes. What evacuation? Phone calls to the plant produced little further information. "Nobody was telling us anything," as one official put it. Plant officials continued to say that the situation was of "no danger to the public," until a message arrived from the plant manager recommending the evacuation of all persons within a five mile radius. The overheating tank exploded (it was near five other tanks
>
> i
> containing acrolein). Quickly the situation escalated: some 17.000 persons were evacuated, and traffic on the Mississippi River was stopped along a 12-mile safety zone, while public officials were kept almost totally ignorant of the explosion situation and how it could evolve.
> Sophisticated physical means existed for early warnings (such as a hotline system between emergency centers and the dangerous plants in the zone). Public emergency

personnel were sent to the plan: upon arriving, they were isolated with the public relations man and were not included in any technical meetings. The emergency system could have been undercut by a single factor: isolation, which rapidly led to general mistrust. Only the exceptional context prevented this potential crisis from becoming a full-fledged one. The police forces were able to close off the area within a few minutes, and the population was well-informed about chemical hazards in the area (5).

*Internal Divisions*

Internal cohesion begins to crumble, giving way to conflict. This causes the organization to lose the potential inherent in a system, *i.e.* the presence of coordinated forces each working toward specific goals.

Such situations bring to light struggles for influence, reopen conflicts when the setting seems to offer an advantage to some group or individual who felt harmed by the conclusion of a previous conflict or arbitration, set officials looking for safety hatches to save their careers, and so forth. The tendency may become overwhelming if the organization gradually becomes penetrated with the feeling that the crisis is a live grenade which must be passed on to someone else as quickly as possible if it has the poor taste to land in your hands. This type of problem surfaces regularly when we examine how members are prepared for speaking to the media: "My boss was systematically unavailable," or "The only briefing I got from my director was between two phone calls, saying 'So you're the one who's going to talk on the evening news. Be careful, it could turn into a trap'. "

*Disappearance of top management*

If ever solid top management is necessary, it is during a crisis. Leaders have key responsibilities to perform: building relations with the environment, ensuring internal coherence, and reaffirming or redesigning the system's goals[1].

But reticence is strong, especially for the very psychological reasons that feed the crisis, such as our inability to tolerate ambiguity and doubt. Anyone who is unsettled by the fact that it is impossible to make clear, visible, and far-reaching decisions right away will be hard pressed to resist simply fading away in a disruptive situation. In contrast, "the rare executives who are best at dealing with crises are those who have a high tolerance for the unstructured and can hold several conflicting views simultaneously until a resolution is found", writes American Motor's Gerald C. Meyers (7).

People are also afraid to take risks and leave themselves exposed. The underlying idea is that a crisis situation is too blurry and too unsure for headquarters leadership to move in quickly. Everyone prefers to wait for the difficulties to blow over, until the usual rules can be applied in a cool-headed manner, before they will run the risk of stepping in. Obviously, this attitude

1. On this subject, Henry Kissinger took note of Richard Nixon's preoccupation when selecting his cabinet members, with advice from Nelson Rockefeller: "Nixon had asked him (Rockefeller) many questions about me, and especially about my performance under pressure" (6).

only leaves the crisis all the room it needs to flourish. Such a lack of direction serves to accentuate considerably two further weaknesses.

### *A lack of initiative*

The event hits. The first reaction of the person at the helm is fear - fear of choosing the wrong decision and making the situation worse, fear of straying from the framework of standard orders and norms. Beyond the agent in command, other organizations, either directly implicated or only indirectly concerned, must be taken into account. It has often been noted that the further you go from the problem's epicenter, the weaker people's capacity for taking initiative becomes - yet those with some distance on the issue are precisely the ones who have some latitude to act. Because organizations are cumbersome, with a low capacity for working in close, positive collaboration with other organizations (they are much better versed in defending their respective territories), they are often ill-prepared to take initiatives in the face of events.

Just when new types of behavior are necessary to come to grips with an exceptional event, everyone settles into a waiting posture, readily remarking that they are not specifically concerned by the problem - which is always a valid argument, since a crisis never singles out a particular target.

This lack of initiative simply clears a path before the crisis. Yet only a system that has been prepared, tested, and trained can summon the creativity necessary for such an unusual challenge. A capacity for tactical riposte and an ability to ask non-routine questions are vital to be able to adapt quickly and meet the challenge. Without these elements, there are hundreds of good reasons for doing nothing, and there are no laws specifying just what constitutes an abuse of power or, on the contrary, a failure to come to the assistance of persons or organizations at risk. So everyone waits - and the field is left open to crisis, which quickly entrenches itself.

### *A failure to anticipate*

We cannot wrestle effectively with a crisis if we do not anticipate its trajectory and how it may develop. Fighting against its present symptoms actually means simply running after the shadow it has left behind, whereas the key is to stop its progression. But how can anyone anticipate, without knowing exactly what is happening? To anticipate, we need to understand, which would mean we were already in control.

Nonetheless, the need for certain forms of anticipation is fairly clear. When an accident takes place near an international border, for instance, it doesn't take a visionary to begin thinking immediately about informing neighboring countries. But here again, forces come into play that delay the taking of appropriate measures, even when they are most evident. Here again, fear is lurking nearby, and its presence hampers our realization that we are in a crisis. The most basic questions - What if ? What next ? - go unasked.

The behavior observed is often characterized by an acquired short-sightedness. Any action (once it has been proposed, discussed, and amended through the dense filter of organizational fears) is taken too late. Even the right step proves useless or dangerous, because it is badly timed. And simply not arriving late is not enough: to wrestle down a crisis, it has to be possible to take steps that will alter the dynamics of the event far ahead of time. In short, it isn't enough to deal - as is too often the case - with the problem discovered yesterday.

### *Massive problems in communicating with the public*

The difficulties discussed above are all dramatically intensified by the equally characteristic ineptitude that colors attempts to communicate with the public. And yet this area of information is capital today. As soon as a major hazard threatens, populations become directly concerned by the breakdown. Handling information, and especially working with the media, is actually one of the primary aspects of active crisis management. As a result, it is troubling to observe that, too often, organizations almost instinctively follow a sort of anti-handbook, which has the peculiarity of guiding them rapidly and unerringly toward fiasco, not only in the short term but in the long term as well. The sources of this dolorous process are many (e.g. logistical difficulties, only to be expected in such circumstances; hard-to-establish diagnoses) and they run deep (first among them, the fear of communicating reigning in many headquarters staffs). In any case, the following forms of behavior tend to take over:

- Keeping silent, which stimulates the development of all sorts of rumors, thereby endowing the event with a formidable destructive potential.
- Making statements tinted by an obsessive desire to reassure the population at all costs and to avoid panic: the resulting "everything-is-under control" type of line, far from convincing anybody, has become an alarm signal that means "every man for himself."
- Issuing denials that turn out to be a series of illusory lines of defense, abandoned one after another, until the heart of the matter is revealed; at this point, officials are forced to yield to the weight of the evidence, having lost what remained of their credibility, and more seriously, their respectability.
- Shutting out the world, which leads to David-and-Goliath type battles between observers and those in charge. In a world dominated by the media, any battle engaging the lonely journalist against the powerful institution on the theme of major hazard will rarely turn to the advantage of the latter, especially if the institution's strategy is purely defensive, based on a refusal to communicate.
- Covering up the facts, thereby leading everyone to expect (or search furiously for) the famous last straw that will force officials to confess and admit the truth. There is a growing conviction that any in-depth examination

would surely lead to an endless succession of revelations. This situation is a horror for the officials, and offers a field day to the media, who have a handle on a soap opera that will guarantee their audience ratings for quite some time.

This domino effect, which could also be called the "media disaster scenario," is often followed so conscientiously that it is worth dwelling on further. It can also be explained on structural grounds. In the camp of those in charge, there are several particular causes of paralysis:

- fear of sensationalism and its potential for provoking the dissemination of false (or even correct) information;
- the excessively technical nature (or what is perceived as such) of the problems to be discussed, especially issues of probability;
- cringing before the potential collapse of a brand image or public image;
- refusal to deal with the media, because they seem to be business enterprises ready to do anything to win greater market shares, rather than tools for informing the citizenry;
- rejection of the media as uncontrollable forces, acting with complete impunity: it is impossible to offset the media syndrome that quickly saturates all potential for receiving messages in a crisis; impossible to hold journalists accountable for what they write or say, or the headlines they choose (even when these are in contradiction with an article's contents);
- prudence or even deep suspicion of a press organ that seems to be manipulated by one of the actors in the conflict.

On top of all this comes some surprising reading material. A specialist who reads in the lead of an article from a major weekly magazine that the 2000 deaths in Bhopal were caused by dioxin will be more than dissatisfied - a mockery is being made of the very notion of precise information and clear reasoning. There is also an overlay of burning personal memories or fears aroused by anecdotes passed around by word of mouth. Take the experience of an Electricité de France official who intelligently called the local press without delay to inform it of a minor incident, and who saw the headline, "Terror on the Tarn River" in the next day's paper. The source of the distortion? The newspaper had had a little problem because the President of the Republic was scheduled to visit the area and a sizable amount of space had been reserved for coverage of the event. At the last minute, the trip was cancelled, and the editorial staff seized upon the incident supplied by EDF to fill in the gap. As for the title, the temptation had simply been too great.

Such accounts must be accepted as evidence in the case, but with three additional observations. First of all, while such experiences do pose a real problem, it should not be forgotten that they often have a disproportionate impact in the minds of officials - they enter into a process of self-justification that cannot be ignored. Second, as a top industrial public relations manager told his engineers, "Journalists may say stupid things sometimes, but are you sure you've never led them down the garden path ?" Finally, it is important to realize that a crisis simply amplifies the way things work under normal conditions. If people are accustomed to being condescending with the press,

when the crisis comes they will be disdainful. If they are generally respectful, the crisis won't generate as much tension.

Faced with these numerous lines of resistance, the media respond with equally solid counter resistance:

- the conviction that information is being systematically distorted
- doubt about management's real capacities
- fear for freedom of the press
- sharp annoyance at the classic attacks launched against the press at the slightest excuse, especially those focusing on its supposedly irrepressible appetite for sensational events.

This camp, too, has a rich store of anecdotes. On the same day as the accident at Seveso, acrolein was spilled into the Rhône. The event gave rise to remarkable silence. Only 48 hours later was a press release issued concerning a "recipient" that had spilled, the word "recipient" offering a very partial impression of the truth, which was that a 20-ton wagon had been overturned.

Without a fundamental effort aimed at shared discoveries and mutual appreciation based on greater respect, there is every reason to fear that we are headed toward an extremely costly impasse. At least one elementary fact must be made clear: everyone has too much to lose from adopting a policy of "every man for himself."

Recent experience has shown that positive innovation is possible in this area.[1] Nevertheless, the frame of reference continues to cast a long shadow, filled as it is with a collection of habits that are hard to overcome. These habits determine the immediate reflexes that generally come into play before plans can be set in motion. From that moment on, a distorting prism has been installed and will remain in place throughout the crisis, whatever official gestures of good intention may follow. The case of the *Mont Louis* is a good illustration of a failure on these grounds.

> *The sinking of the Mont Louis and its drums of uranium hexafluoride:* the cargo sank at 4.10 pm on August 25, 1985. The media event began the next day: at 3.01 pm, a dispatch from the French AFP wire service stated, "The *Mont Louis* may have been carrying uranium, according to Greenpeace." Other dispatches followed, raining down like hammer blows:
> - AFP, 4.23 pm, urgent: "Several containers holding radioactive waste were on board the French cargo boat, said a representative of the CFDT national sailors union reached on Sunday at Le Havre. A representative of CGM, the ship's owner, admitted that radioactive products were involved but did not specify their exact nature."
> - AFP, 5.48 pm: "After first claiming not to know what was in the containers, then declaring that it might be "medical material," the CGM representative finally confessed that radioactive material was present. By late Sunday afternoon, however, no indication could be obtained as to how virulent these compounds were or the danger that could result from contact with water following the sinking of the ship."
> - AFP, 6.48 pm, urgent: "CGM stated Sunday evening that the ship's cargo included 450 tons of uranium hexafluoride. CGM cited atomic energy commission sources

1. cf. the handling of the Villeurbanne case in the interview with Philippe Dessaint.

saying that 'temporary submersion of the containers holding this gas represents no danger.' "

- AFP, 7:50 pm: "Crew members rescued from the *Mont Louis* have received instructions from their shipping company to remain silent as to the type of cargo they were transporting, stated the secretary of the CFDT national sailors union on Sunday evening."

- AFP, 7:52 pm: "More on instructions to remain silent: "Journalists waiting at Le Havre airport have been met almost uniformly by the silence of crew members, who are clearly uneasy about discussing the containers. It was, however, possible to learn from some of them, including one young officer, that the containers on board held radioactive materials."

AFP, 8:13-8:28 pm: Summary page: "The ecologist organization Greenpeace, followed by the CFDT sailors union, revealed Sunday afternoon the presence of uranium hexafluoride on board the *Mont Louis* (...). According to the CFDT sailors union, the crew rescued from the French cargo ship received instructions from their employer upon arriving in Great Britain to remain silent about the contents of the cargo. It took the discernment of the ecologist organization Greenpeace to tear away the veil of silence."

Immediately, one image - dissimulation - organized the way the whole matter was perceived. This set the tone throughout the French press, with headlines ranging from "A case handled with surprising discretion" to "The cargo was more dangerous than they said" to "The silence of the deep."

Furthermore, the media crisis was reinforced by a brush with a near diplomatic crisis reported live by RTL, a European French-language radio station: the Belgian secretary of state for the Environment raged in an interview that he could get no information from France - but insisted at the same time that there was "no danger". The dissimulation denounced by a foreign government took on a new stature. It is also interesting to note that the Belgian minister couldn't resist to impulse to reassure his fellow citizens immediately: though he was unable to see the files on the case, he declared that there was "no danger".

The first 48 hours were rough. A media crisis had been created and had sown the seeds for future crises by giving support to the already widespread idea discussed above, that nuclear energy goes hand in hand with dissimulation. The defenses had been breached, and to statements like, "No one would tell us how enriched the uranium was", (RTL, August 27), no one had enough credibility left to deny the assertion.

The objection could be raised that this was a non-event, and in case of a real accident, people would know what to do. That argument seems risky. We should wonder instead whether the very state of major disruption isn't the driving force behind this type of exclusion behavior. Consider NASA's problems during the Challenger catastrophe: "NASA's well-oiled media relations capability - until then one of the best in the field - had failed at a critical time when it most needed. (...) It only took a few hours, but NASA's management myopia and subsequent siege mentality regarding the news media seriously damaged a highly effective press relations program that had been developed and refined over a quarter century of space flight" (8 a).

*NASA's media fiasco* during the Challenger crisis: "The spaceship blew up at 11:40 am. More than an hour later, NASA announced it would hold a press conference at 3:00 pm. It was twice rescheduled, and finally at 4:40 pm spokesman Jesse Moore had little to say other than to confirm what millions of people had seen on

> television five hours earlier. He could have made this statement - all but the fact that a search showed no signs of survivors - well within the 20 minutes directed in NASA's disaster contingency plan. Because of its delay. NASA demonstrated it had lost control of the crisis" (9).
> "Shirley Green, NASA's newly appointed director of public affairs, sits in stunned silence with everyone else in the control room. As emergency procedures go into effect, she carries out her first duty by calling the administrator's office in Washington and then starts thinking about the statement that has to be made to the public. (...) NASA's management is out of town or tied up in implementing its contingency plan for accidents. The top executive for the Office of Space Flight at the Kennedy Space Center that day says he'll talk with reporters, but he keeps being pulled into meetings and saying it will be a few more minutes. Meanwhile, every phone in the NASA press center is ringing, and reporters are milling around wanting details, pictures, information, interviews - anything.
> A press briefing is scheduled and then repeatedly postponed. White House Press Secretary Larry Speakes is calling, wanting to know when NASA is going to say something. He keeps getting the same answer - in a few more minutes. More hours pass. By the time a briefing is held, the die has been cast. What went on in those four and a half hours so tainted NASA's relations with the new media that neither Shirley Green nor anyone else could reverse the situation in the following months" (8 b).

## *System-wide problems*

We have seen how a series of problems can affect each of the organizations involved in an event. But it should be clear in this day and age that because of the complexity of our societies, such events call for whole systems to intervene. Here again, crisis generates serious difficulties, in the form of incoherency and contradiction:

- among the elements of a single system involved in the matter,
- among national and regional levels,
- among countries when the problem crosses borders.

If the issue of how to function, communicate, and develop mutual trust cannot be contained, then there is a high risk of either sporadic or general explosion. When connecting links between subsystems do not exist or fail to operate, this absence of a steering system leaves the way open to disintegration, and a dreadful scattering effect sets in just when it is absolutely necessary to construct a coordinated response. This problem of system explosion was clearly brought to light by the senatorial investigative commission dealing with the Amoco Cadiz.

> *Amoco Cadiz:* "What is at issue here is a complicated system in which information is shared among various agents who are more or less unaware of each other, and in which any bit of information is chopped up and circulates badly. Paradoxically, the information received finally results in the ignorance of the authority with competence to act. This is a system in which one administration has powers but no material means and must request the latter from another administration, which decides whether it would be advantageous to grant them, or inversely, an administration having material means does not receive the information that would stimulate it to use them, or does not

> have the power to use them. In short, this is a fractured system, deprived of any synthetic function" (10).

In this case, the explosion's size remained fairly limited. It became general in the Western European reaction to Chernobyl. An image on French television took on symbolic force: a head of lettuce held by a journalist (straddling the border) in her left hand, representing German produce and labelled "to be destroyed" - and the same head, shifted into her right hand, suddenly labelled "edible," because the product was in France.

Other system problems may emerge, such as role changes that take place in highly tumultuous periods. In the area of information, this is a very sensitive issue. The person who can organize and manage information acquires a key operational role. In the case of the San Juan Ixhuatepec catastrophe in 1984, for example, the major television station Télévisa had technical means, organization, and high credibility on its side, and its role in handling information rapidly conferred upon it an important function of crisis management: live and non-stop data exchange among numerous persons - all regular programming had been suspended. This same phenomenon can affect the expert, the consultant, or some charismatic figure. In a relatively minor incident, it remains anecdotal. But if the crisis is severe, such a shift in roles can entail serious problems. Power may soon fall into the hands of the person who speaks best to people's fantasies, fears, or their desires for simplicity of passivity - and a lot may hinge on how a person comes across on television.

## 2. Slipping out of control

Once this dynamic has settled in, there is every chance that the event will lay down the law. There where a unified response is called for, only uncoordinated reactions are to be found, and these cancel each other out while magnifying the impact of the perverse effects and paradoxes that characterize any crisis situation. When attempts at public information fail, tactical and strategic difficulties are accentuated. System-wide problems begin to resonate with the numerous localized difficulties. Eventually, this leads to the conjunction of three processes.

### *Navigating in the dark*

No one knows anymore how the system should be guided. Actors are confronted by an accumulation of impossible choices. All roads seem to be blocked. The Bhopal case reveals the full complexity of such a situation - a

complexity present to greater or lesser degrees in any post-accidental situation.

Bhopal: For Union Carbide, each line of questioning threatened to become a terrible trap:

- Where the same safety measures taken in Bhopal as in the United States? If not, the door was open to a battle over the exploitation of third world countries. If so, then sharp tension would begin to build around the similar American site.

- What immediate measures did the company intend to take? It could stop producing methylisocyanate (MIC) until it was able to understand what had happened in Bhopal. But could a strategy be based on that decision, knowing that collecting information would be long and difficult? And why not stop production of chemicals that were even more worrisome, such as chlorine, manufactured and transported in much greater quantities?

- Was Union Carbide's safety policy adequate to meet such risks? There the answer had to be yes. But if so, how could anyone account for the avalanche of problems observed (or revealed) at Bhopal, including design flaws, faulty maintenance, insufficient prevention efforts, and poorly trained personnel? In its January 28, 1985 feature, the *New York Times* identified ten procedural violations. Could it be claimed that the Indians were responsible for operating the plant? Of course, but no one could pretend that the headquarters in Danbury had not given close attention to problems Union Carbide qualified as having "absolute priority." Nor could there be any question of laying all the blame on the Indians - both at present and in the future, interests in India and elsewhere closed off that alternative.

- Could the company pay? Here again, the answer had to be yes. But a thin line had to be trodden: generating excessive confidence in its capacities could lead the plaintiffs (and their many lawyers) to raise the stakes, and that would change the entire picture.

- What basis would be used to calculate indemnities? If North American standards were applied, doubts could be raised as to the firm's financial capacities. If standards more appropriate to the country involved were used, the strategically volatile debate on multinationals vs. the third world could blow open again. One more detail: the firm still had to face attacks from within, as its own shareholders were undertaking legal action against the board of directors for placing their investments at risk.

On the Indian side, the situation was also awkward. The local subsidiary held undeniable responsibilities. The Americans couldn't be blamed for urban planning problems (except for having provided insufficient information on the product). Even small efforts to inform the public could have saved a great many human lives. Also, the connections between the subsidiary's management and top-ranking local officials raised eyebrows: both belonged to the same party as the prime minister, and elections were close at hand (11, 12, 13, 14).

## *Endless battlefronts*

Suddenly or inexorably, conflicts develop among the many actors involved, beginning with the primary figures - the operator, public authorities, the victims - and followed by the press, the experts, various associations, and so on. Each actor has a specific vision of the world, with specific goals, interests, and fears. Each will react according to underlying personal patterns based more or less firmly on rationality, objectivity, subjectivity, and breadth of vision. But above all, each is confronted with a poorly structured situation and with uncertainty and ambiguity that tend to rigidify and simplify the way an actor finds, assimilates, and tests information. Abysses of incomprehension open up. Individuals and groups come to be judged for their intentions, real or imagined. And besides, everything seems to prove that this is the best way to behave, for each actor involved.

Paul Shrivastava (14) developed this analysis of the Bhopal case and pointed out the numerous criteria separating various points of view:

- On human costs: according to the Indian governments, 1773 immediate deaths, 300,000 wounded with unknown long-term effects; according to Union Carbide, approximately 1700 immediate deaths, 60,000 wounded, no long-term effects; according to the victims, 3000 to 10,000 deaths, 300,000 wounded, vast long-term effects.
- On the cause of the catastrophe: sabotage, according to Union Carbide; industrial genocide, according to militant critics.
-What gases were really involved: MIC only, for some sources; hydrocyanic acid, for others. The latter applied treatments that they claimed gave noteworthy results. But admissions that this chemical was effectively present would, again according to these sources, create serious problems for both Union Carbide and the government (which could then be accused of failing to apply known treatments against the chemical's effects). Was it even necessary to prove this point of view was right? Under the pretext of a local demonstration, the police closed the clinic dispensing this treatment. That was all it took to validate the hypothesis.

So the crisis advances, mixing true with false, undeniable opposition and simple interpretational errors. The risks then is that generalized irrationality will take over, and those in charge will respond in kind, practicing what amounts to exorcism, for instance, or staging media coups for their short-term impact. Nor can the possibility of wildcat reactions be excluded, when no one any longer believes orderly discussion or debate can take place. These symptoms of impotence become overpowering when everyone involved has lost large shares of credibility, legitimacy, and even respectability.

At this point, a general feeling of powerlessness and disgust sets in. This was visible in the aftermath of the gas explosion in Mexico City in 1984. The idea was formulated in the press: this time, there isn't even a crisis, we're just waiting for the next disaster. "The government, as is its custom, won't do much. It will wait for time to calm people's minds and make them forget it all." This judgment, rendered by the opposition newspaper *Proceso* on October 26, 1984, seemed indeed to summarize a feeling that was general, even among the forces in power.

No on speaks anymore across the barricades and the partitions. Everyone is busy hunting for ammunition, and any excuse is seized upon to avoid clarifying even the slightest aspect of the situation. The crisis becomes increasingly independent of the original event. The fundamental points that should have been discussed - controlling technology, managing development - are forgotten in favor of a sort of Brownian motion that soon sweeps up everything in its path.

## *Self-sustaining crisis*

The case become a gnawing abscess, attracting masses of difficulties and anguish totally unrelated to the original event. At this point, the crisis carries us beyond the scope of this work...

This is the frame of reference. Obviously, its brings together too many difficulties in a single picture for us to recognize any single situation in it - thank goodness. Nonetheless, there are multiple ways in which a major accident can profoundly destabilize the social system, or a minor accident can unleash excessive turmoil. Everything comes down to a question of the balance between the strength of die external disturbance and the context in which it strikes.

This general frame of reference should solicit serious efforts to analyze, organize, and learn from it. And some fundamental questions need to be asked. As we have seen, deeply preoccupying threats hover on the horizon - systems may be so severely out of balance that even a major catastrophe will not trigger any corrective reaction. The task here is not so simply to design a series of techniques for keeping periodic outbreaks under control - crisis management only takes on meaning when it becomes part of a process that takes into account a multi-layered socio-economic reality. Clearly the task is not a simple one.

To set the process in motion, it seems best at this point to delve into the experience of those who have been through this type of situation and faced these questions. This approach has a twofold advantage: we can gain precious insight from seeing how officials confronted the great unknowns and the multiple facets of crisis; equally precious insights are to be found in comparing a variety of points of view - those of the victim, the journalist, the

expert, the consultant, the high-ranking politician, and others. This will help broaden everyone's horizons - and as we have already seen, staying locked inside a narrow world vision is one of the primary factors contributing to paralyze a situation. So we will turn the stage over to these actors from numerous crises, who analyze their experience here. They have much to teach us.

PART TWO

# *Technological Crisis and the Actors Involved*

# 3. In the thick of things

The most revealing approach to investigating the world of post-accident crisis is to hear the story from the point of view of major decision-makers who were directly involved. This is why we turned to the individuals who found themselves in the eye of the storm during crises that were especially challenging, or at least highly instructive.

The cases examined here cover a wide range of situations. Some are terrifying catastrophes (like Bhopal) and large-scale incidents (the *Amoco Cadiz* oil spill; massive population evacuation in Mississauga, Canada; Rhine pollution from Basel, Switzerland). Others involve serious accidents provoking widespread disorder (Three Mile Island; the worldwide grounding of DC-10s in 1979). Still others were more circumscribed industrial accidents (the Edouard-Herriot Port fire in Lyons, France) or incidents and events that triggered crises - or narrowly failed to do so (the disappearance of waste drums from Seveso, Italy; the PCB transformer trouble in Villeurbanne, France in 1986; coinciding technical incidents on the French electricity distribution network and in a nuclear power plant on the same day, January 12, 1987).

In developing this study, we began by presenting the project to the selected decision-makers, emphasizing its very specific goals. What we wanted was their own experience, replete with examples and even anecdotes. In such circumstances, apparently insignificant details can take on tremendous importance, and it seemed fundamental to ground this exploration in a constant reference to actual facts. An attempt was also made throughout these interviews to extract ideas that would be useful to other decision-makers who might one day be faced with similar problems, as well as to provide food for thought to those with a more general desire to understand this field better.

In practical terms, we met with the individuals who accepted the invitation for interviews lasting from forty-five minutes to two hours. Working from an integral transcript of these meetings, we drafted a text providing a clear and concise presentation of the discussion emerging from each interview. The interviewees were then asked to look over the document and make any changes they thought necessary. Sometimes only a few words were corrected, but in other cases, rereading the article was a springboard to numerous new

ideas. As a result, some contributions were enriched through one or more successive drafts.

The interview questionnaire was as basic as possible:

- How were you drawn into this crisis ?
- What were the most difficult moments ?
- What lessons did you learn ?
- What general guidelines would you suggest for managing post-accident situations ?

Once again, the goal was not to push these figures into contradicting themselves, but rather to work with them in order to learn as much as possible from their experiences.

To discuss the events referred to above, the following individuals (referred to by the positions they occupied at the time of the events in question) graciously agreed to share their experiences with us:

1. Marc Becam, France's Secretary of State for Local Government: *Amoco Cadiz* oil spill.
2. Richard Thornburgh, Governor of Pennsylvania (USA): Three Mile Island.
3. Douglas K. Burrows, Chief of the Peel Regional Police Force (Ontario, Canada): the Mississauga evacuation.
4. Péter-J. Hargitay, Chairman of Hargitay & Partners AG, Zollikon-Zurich, Switzerland: Bhopal chemical disaster.
5. Edgar Fasel, Deputy Director in charge of External Relations and Economic Issues, Sandoz SA, Basel, Switzerland: Rhine pollution from a warehouse fire.
6. Philippe Vesseron, Technical Advisor to France's Minister of Environment (under Michel Crépeau, then Huguette Bouchardeau): the disappearance of the Seveso waste drums.
7. Bernard Favez, Deputy General Director of Electricité de France: EDF incidents on January 12, 1987.
8. Claude Frantzen, Associate Director in charge of Technical Supervision, and Laurent du Boullay, Head of the Certification Office, French Civil Aviation Authority, Ministry of Transportation: the DC-10 crisis.
9. Gilbert Carrère, Prefect of the Rhône-Alpes Region, Prefect of the Rhône district of France: the Villeurbanne PCB transformer fire and the Port Edouard-Herriot fire.

Now let us follow these decision-makers into the turbulent world of crisis appearing in the aftermath of a technical failure.

MARC BECAM

# The oil spill from the “Amoco Cadiz”

March - May, 1978

**Background**

On Thursday, March 16, 1978, shortly before midnight, the *Amoco Cadiz,* a 210,000-ton oil tanker, hit the rocks off the northern coast of Britanny, France. This was the beginning of a long and trying episode: some 250 kilometers of coastline were polluted. A gigantic protection and cleaning operation was undertaken, involving 10,000 workers and 1000 machines - and all at the height of an election campaign. This was the sixth oil slick to hit Britanny in the space of a few years. Tensions ran Mgh. Marc Becam, then a member of the government, a Breton and a native of the stricken area as well, was chosen by Raymond Barre, Prime Minister at the time, to oversee the whole operation. This was the first time France had been hit by a catastrophe of this magnitude, and the first time such a general coordinator was named by the government to take in hand a response on this scale.

P.L.: A supertanker runs aground, the oil spills, Britanny is overwhelmed. How did you plunge into your task?

M. BECAM: How did I plunge into the task? In two phases. The accident took place during the night of March 16 to 17, a Thursday. But not just any Thursday! It was the Thursday between the two weekends of the legislative elections.

*Thursday, March 16, during the night*

Having been elected in the first round, I was lending support to my comrades for the second round, attending election rallies all over the area. I got home between midnight and one after the last meeting, and my wife said, "You have to call the prefect right away, there's a problem." At the time, I was Secretary of State for Local Government, with a portfolio for emergency management - which explains why I was immediately informed. Of a big problem. What could I do at one in the morning?

My first concern was for the people on board. I was fully aware that rescue operations were under way, in dangerous conditions that the navy was handling perfectly. This is something about which very little was said,

especially in the reports from parliamentary committees. There were 42 people on board; they were all saved. The helicopter worked at night in winds reaching 110 kilometers/hour. The fumes from the oil could have set off an explosion destroying everything, including the helicopter. So the first point was, the crew was saved, with remarkable skill, by the Navy. Bravo for the Navy!

A second point: when you've saved human lives, what else can you do between one and two o'clock in the morning during a storm? Absolutely nothing. So I said to the prefect, "We'll meet with all the authorities in your office tomorrow morning at eight."

*Friday, March 17*

Meeting in the prefect's office. The Minister of the Interior, Christian Bonnet, sends instructions: "Marc Becam, you have the authority to take preliminary measures." In particular, this meant deciding whether to set fire to the ship - or to avoid it at all costs. This was a major issue, and we couldn't do the wrong thing. Contact with emergency management: "Here are the technical characteristics of the ship and the oil in question. Please consult three international experts successively, requesting their opinions and then-analysis of what was learned in Spain [in April of the preceding year, a grounded oil tanker had been burned]. You are to give me your answer at the end of the morning. I will be at the Navy Staff Headquarters in Brest." In the meantime, I go on-site with the emergency management helicopter to try to estimate the extent of the disaster - though I'm not an expert.

End of the morning: I decide not to burn the ship. The admiral and the sailors had gotten their own information. The consensus was, "You could try to set it on fire, though it might not take. But if you manage, you'll have a fire that will last some 20 days, with heavy smoke and serious atmospheric pollution. The smoke will carry tar particles that will settle up to 30 or 50 km away, depending on the winds." I could just imagine the oil particles settling on the heads of cauliflower in this major vegetable-growing area.

At that time, I wasn't yet in charge of coordinating the clean-up battle. The line between the land prefect's authority and that of the maritime prefect was not clearly defined, so there was a lot of "see him, see me." That's where things stood on Friday.

*Saturday, March 18*

The Prime Minister, Raymond Barre, came on-site. There were hostile demonstrations, especially by all the Breton-language organizations, who believed that "France is a foreign country that has occupied Britanny for centuries." The atmosphere was ugly. Obviously, the press campaign burst out really fast. The Paris journalists were there, meeting with anyone who would talk to them (I'll come right back to this issue). That meant ecologists and unions, especially the CFDT [Confédération Française Démocratique du

Travail] union, which was close to the radical-left socialist party (PSU) in the area, and therefore to the ecologists, and so on. All rushing to say that this was all the government's fault, because it hadn't had the sense, for example, to put protective launches every three kilometers. Raymond Barre left: nothing had been done, except that the first army units - including the special unit from Brignoles (the emergency management unit) - were on the way. And all available booms had been requisitioned.

*Wednesday, March 22*

Saturday to Wednesday: what a long time! Wednesday morning, I made a speech at the Council of Ministers: the situation was a catastrophe, waves of oil kept flowing from the ship's hull (I'd been on-site again the day before). Emergency management had sent help, but always via the conventional administrative authority. When the council meeting was over, I went back to my office at the Ministry of the Interior. Half an hour later, Raymond Barre called:

"Mr Becam, you have to go on-site. I am delegating all my powers to you. You have the same powers as the Prime Minister. You must take charge of the clean-up battle."

"Listen - all right, but how? I don't have any training in this. I was trained as an agricultural engineer - well, all right."

"Co-ordinating meeting in an hour and a half at my offices."

In the meantime, I prepared the trip back (on a regular flight: that day I couldn't even get a special ministerial plane), with three of my four co-workers: my cabinet director, originally from northern Britanny (we were in high school together); my cabinet chief, also a Breton, who handled the administration of the whole thing with discreet efficiency; and a third (from Landeda, a stone's throw from where the tanker ran aground) who was a born organizer and a whiz on the phone.

While they were organizing things, I went to see the Prime Minister. The Minister of Defense, Yvon Bourges, had also been summoned. The promise to delegate power to me was not an idle one. At one point, Raymond Barre said to the defense minister, "Mr Bourges, Mr Becam is in charge. What means he asks for, you will provide." To me, who was only a secretary of state. In protocol terms, I must have been ranked twenty-sixth or twenty-seventh in the government, whereas Yvon Bourges was fourth or fifth.

*On the front, two immediate initiatives*

Then I went out there, my heart in my throat, but calm, thinking to myself, "My friend, how are you going to handle that? You're really in for it. You've got to be the buffer, the safety valve and all, how are you going to do it?"

P.L.: What were actually the most difficult moments?

M. BECAM: My arrival there, for one.

P.L.: And what did you do?

M. BECAM: I did two things as soon as I got there. First, held a meeting with all the mayors from the sector at the Ploudalmézeau town hall Don't forget that at the time, the damages were still limited; the problem hadn't yet begun crossing county lines as it did later. Above all, nothing was certain: the slick was moving around with the winds, and the winds were turning. So there were ten or twelve grouchy mayors. I told them, "Look, what's the point of crying? We're in deep s—. The best thing is to roll up our sleeves and work together. I'll have the means, so I can help you. You can count on me, including for the reimbursement of damages. I'll help you to the bitter end. And you've got to make things easy for me, because if you go soft on me, we may as well give up, go home and close the shutters like when there's a hurricane. But this isn't a hurricane, and it's not the time to hole up. We've got to get out there."

I should specify one thing: I was born and raised in Finistère, and I spent the first half of my life in the area of the accident. What's more, I spent seven years working as an administrative director of the farm unions in Finistère from 1959 to 1967. I sensed right away that that was a tremendous piece of luck. People knew me as well as they knew the postman. I realized immediately that if this accident had taken place in Corsica, I would have been pushed out without being able to solve the problem. But here, I was one of them, on my home territory. That was immensely helpful, even more so because with the delegation from the Prime Minister, I could say, "I can get what it takes." The meeting was held as soon as I arrived, at about four in the afternoon.

An hour later, I moved again, calling a press conference. I said to the journalists, "Listen. It's simple. Here's my offer: every day at five in the afternoon, a press update. And I'll leave a place free every day in the emergency management helicopter for a reporter. I've got nothing to hide. We're in an awful mess. It's up to me to deal with it. I'll tell you what I know -1 won't hide anything from you."

The attitude of the press was transformed immediately. The very next day, I took them in the helicopter along the coast. And I said, "You ask the questions, I'll answer them." We did the interview live from the helicopter. You can imagine how much that interests the radio stations! After a few minutes, the journalist said, "Listen, it would be easier if you did the

question-and-answer yourself. Keep the mike, it's very noisy in the helicopter." So I did the commentary myself - there was no way they could cut me down. I was in total control, live on the radio. The live broadcast from the helicopter, the exclusive report, the exclusive interview all went over marvelously well.

There you have it, my first two actions.

## *The power of instinct: fighting, encountering, explaining*

It was like a war, this crisis: a 250-kilometer front, 10,000 troops, 1000 machines, a 13-week campaign. Being more intuitive than cerebral, I reacted by instinct: that was the driving force in my response. And in a crisis, instinct helps. I was in the field as much as possible. If I had to leave, say to go to a council of ministers, it was during the week. On weekends, I never left the coast. I couldn't ask the soldiers, volunteers, and firemen to stay on duty, even on Easter Sunday, and then go be with my own family. On Easter Sunday, on the Easter Monday holiday, I went from site to site, like - like a general visiting the front. I was on the front.

During that Easter weekend I had another memorable exchange. I'd landed with the helicopter on Locquirec Beach for a meeting with the mayors in the sector. They came toward me as I was getting out of the helicopter on the beach, all dressed as I was, in boots and Breton reefers. One of them stepped up to me, saying,

- "Marc, don't you recognize me?"
- " Sure ", I said, "I recognize your face, but I can't place it."
- "Marc, you remember the unions, ten years ago..."
-"Oh, sure!"

Then he said, "Marc, are you still on our side? Can we still call you 'Marc'?"

That was his sentence: " Marc - can we still call you Marc? "

And I said, "Certainly. I haven't forgotten my years with the unions, and besides, war is war. You'll see. I'm fighting the same battle as you are."

Because I was from Finistère, because I'd been a union worker, because I had the place in my guts, things were easier. Otherwise they would have said, "Sir, you were sent by the government, therefore you are on the other side of the fence." Raymond Barre had the right idea. That meeting in Locquirec? We held it in a café. We had to talk with the mayors about creating giant ditches for temporarily containing the oil that had been pumped. We were overwhelmed by the quantities being recovered. We had mobilized several degassing stations: they were all full. We had entire trainloads stuck in the Côtes-du-Nord area because there was nowhere to send them. I had to find storage, take all the precautions, and explain what we were going to do. "There's no other solution, otherwise we're going to be completely overwhelmed."

I have to add that we were learning the technique as we went along. We'd worked all the farmers' sump pumps really hard, but after two or three days, the farmers didn't want to lend them any more. They said, "Our pumps are going to be ruined by the oil." So there was a meeting with union leaders - I had meetings all the time. Resulting in a written promise from me that the repairs would be covered by the overall "war" organization. I said, "We have to move now, as fast as possible, because in a few days, when that stuff thickens, we won't be able to use the same techniques."

P.L.: And you - as the cornerstone of the whole system, what worried you most?

M. BECAM: The thing seemed so immense that... What worried me the most was Easter at Portsall. The situation was getting worse, going downhill every day. The more we picked up, the more there was. I thought to myself, "There's no way... It's going to kill us! There's no way. We aren't going to make it."

Of course I never said so. Of course I said the opposite. I kept that out of any conversation. But inside, I thought, "My boy, there's no way. It's going to kill us, we're going to die, this business will wear us out. And the goo is getting thicker." It was like watching the end of the world.

Yet we had more and more equipment - special skimmers costing 10,000 Francs a day per machine - and soldiers from everywhere. I went to see them, I used my authority to demand that showers be installed within 24 hours in a given building (because the soldiers who were going home had to be able to wash). Sometimes I ate with them at the mess. Me, in the midst of the war.

What worried me the most was to think, "We're never going to overcome the problem."

Then the debate came wide open: "Wouldn't it be better to mine the ship and cause a massive spill, instead of fighting this interminable flow ? " So with the admiral, we decided to mine the ship. I took the responsibility, because those were the rules.

P.L.: What were the moments when things could have gotten out of control?

M. BECAM: There was the debate that started - after the fact — about my first decision not to burn the tanker. After I had taken charge of the operation, at least eight days after the fact, the Spanish experts came and said, "You should have burned it." A week earlier, everything pointed in one direction: "Don't fire it, the consequences would be too great." A week later, the question was open again: "If Becam had agreed to bum it on the first day, things wouldn't be where they are now." What's more, certain local politicians, including my friend Senator Georges Lombard (a former mayor of Brest), agreed with these outsiders, even in the press.

P.L.: Could the situation have begun to fester? Could the rumor have spread, say, that the oil was toxic, or that the clean-up workers were all going to develop cancer?

M. BECAM: Oh, there was that, too. After a few days, people had skin problems on their hands. We responded: "There have been some skin problems. Please take the following precautions." We gave lotions to the soldiers (who were mainly draftees) and to the firemen. We gave details to the press. I said, "Not one soldier has been hospitalized. We have 10,000 men, not one soldier has been hospitalized." A little later, I said, "There has been one hospitalization, for appendicitis. Sorry it's so little. Where there are 10,000 people working, with 1000 machines, there hasn't been one broken bone, or one fall on the rocks. But people want to think that..."

Off I went, excited like that. My temper got loose. I said, "Come take my place if you want. But honestly, what are you after?" And people calmed down. In a fight, I defended myself tooth and claw.

P.L.: But were you afraid of rumors of the type, "In six months, fifteen people will have died of cancer" ?

M. BECAM: NO. Besides, I was too busy. It was cold out, but we were in the heat of the action. By nature, I'm a man of action, instinctively I adore action. Even if I'm scared before, once in the thick of it, I'm okay. "Now let's do it." The will to win. Like an election, the will to win. I stop feeling tired at all. Then, day or night, there's never a doubt. There's a goal to reach and nothing else, and you use everything you've got.

P.L.: What were the lessons?

M. BECAM : My first piece of advice is, set up the headquarters immediately, on-site. And not at the regional capital a hundred kilometers away, just because it has the telex, the machines, the secretaries, the antenna, the radio, or whatever else. You go on-site. You set up your headquarters on the terrain, first of all.

Second, maybe even before setting up your headquarters, you create a newsroom. I realized afterwards what a good thing it was to have understood that the primary problem was getting information to the press. I told the journalists, "Here you are, we've installed heaters, this place is for you, here are the phones, you can do what you want, I'm at your disposal." That way you avoid all sorts of deviousness. The journalists do their job - if someone wants to talk to them, make a statement, they want nothing better than to record it. They never refused my statements or said things like, "We only want to see the ecologists." But the fact remains that no official went to see them on the very first day. The ecologists were there, saying, "Look at that, now we're all going to die, then we'll have cancer, and so on. And with the nuclear reactor they're planning next door, our children will have birth defects."

For me, it's that simple. Maybe I'm wrong, but that's what I think.

I would add one difficulty I had to face. I was up to my neck in the clean-up, and despite that, I had to go every week to the council of ministers and answer questions from the Assembly and the Senate.

P.L.: Already, at that time?

M. BECAM: Already during the clean-up battle, in April. There was a nine-hour discussion in the Senate. Yours truly spent nine hours with the

Senate. Go back to the *Official Journal* and you'll see how the Communist Anicet Le Pors shoots me down. He was a senator, originally from the area. At the time, we couldn't pump any more. We were starting to clean the rocks at Perros-Guirec using steam, rock by rock. It was insane. Herculean work, slave labor, cleaning pebble by pebble along 250 kilometers! When you think about it... and when there were no pebbles, there was sand. And in the sand, we realized that the fuel sunk in, one meter deep. So we got plows and we plowed the beaches: since it was a biodegradable product, we had to turn the sand over to bring the oil into the sunlight.

An H.Q. on site and information for the media - those are the two pieces of advice I would give to someone with that type of problem. And then, you have to act so that it doesn't happen again. My deepest conviction is that if an accident happened again, it would be the same thing. Our only chance is to work to avoid its happening ten times, so that it might only happen nine, or eight, seven, or preferably five, or four times. Prevention is everything. The best thing that's been done in my opinion is the Ouessant tower that surveys navigation twenty-four hours a day. Before, there was a little installation that operated during the day and closed at night. We also moved the shipping lane further out, to give us more time to act. And the regulations have been changed. European and international regulations made more progress in the space of a few weeks than they had in ten years. Penalties were stiffened. And we redrafted the maritime and-pollution emergency plan - in the thick of it. Afterwards, everyone would have forgotten about it.

The parliamentary commissions advanced the tugboat solution. "If tugboats had been sent out, this wouldn't have happened." That was the theory - my personal belief is that it would have happened anyway. The proof is that since then, the tugboats stationed have already had to intervene - every time the situation was bad, even when the boat was empty, it has run aground. We do, however, have to develop systems, with tugs plus teams of helicopter-lifted specialists.

P.L.: Let me go back to a touchy point. You chose to be very open with the journalists - "I have nothing to hide". But what did you do when you began having doubts yourself, when you thought, "There's no way, we aren't going to make it" ? Did you admit you were weary and desperate, or did you keep that to yourself ? How did you decide what to tell and what to keep to yourself?

M. BECAM: I don't know anymore how I decided. Of course they saw the same things I did. Maybe in my response, in my attitude, there was an element of bluff. But more importantly, it was the attitude of a go-getter, someone who was standing up to the situation.

And probably above all, there was a factual attitude: "Here is the tonnage picked up this week, here are the quantities picked up today. Here are the numbers of cubic meters treated at Le Havre and at La Palice degassing stations. At least what has already been purified is no longer in the ocean! So we have to keep going. This isn't the time to give up," and so on, all the while thinking, "More is coming in than I'm picking up!" But I had to respond that

way: "There can be no question of my giving up. You journalists would already be back in Paris if the issue weren't highly complex."

Besides, they saw that I was standing up. I'm not very tall. In fact, I'm short. But I hang in there! That's all. People also had some sympathy; I think a feeling got through. I was dressed naturally, dirty like everyone else. And I kept moving around. I went to visit the troops, I stayed on the terrain. I never stopped. People said, "He's not going to make it," and at the same time, "He seems to be dealing with it." And maybe, "We mustn't knock him down. Because people are fragile, so let's not push too hard."

P.L.: That also came into play somewhat.

M. BECAM: Somewhat. Americans call it "noblesse oblige." Just a little sense of duty, without having to ask for it. Because if you say, "Have some sense of duty!" people resist. In the end, my attitude inspired them to say, "Why not?" Especially because I always told the biggest complainer, "Tomorrow you can come with me."

P.L.: What about the contradictory official positions? The Minister of the Interior declaring, "The shipping lane isn't too close, it's fine," while the President of the Republic proceeded to state, "It is unacceptable to have ships passing so close to the coast." And the Minister of the Environment emphasizing that there was no problem, because "on the polluted beaches, the oil will be absorbed by the sand." This is classic in crisis situations, but how did you handle the problem?

M. BECAM: That's true, it was coming at me from all sides, hitting me from everywhere. You want to say, "Listen, shut up and leave me alone." And my friend Lombard and the other senators - I thought, "Those rats, they're in suits and ties and they have their senate seats [I wasn't a senator yet, I became one later]. I'd have liked to see them on-site - it's easy to criticize! I'm making such an effort, and during that time, they're off spending Easter week on vacation, on some island in the Mediterranean. They should have a little decency." That was for the direct attacks.

For the other positions taken, well, sticks and stones may break my bones. My rule of thumb was, I've got other problems, and there's always an idiot ready to make a statement. I didn't make any direct counter-statements. I explained politely: "Oil does have a way of sinking into sand." I wrote a technical notice. And if necessary, I added, "If you've got a better idea, give it to me first thing tomorrow."

And I kept saying and repeating, especially in the Senate, "No country in the world has mastered the problem yet of stopping a boat from going onto the rocks if it's there and in trouble. There's nothing to be done. You have to act much earlier."

P.L.: What if you had to confront an even more serious accident - a ship transporting toxic chemicals or nuclear materials? What if you had to deal with much deeper despair and a drastic mistrust of technology and government? What would you do?

M. BECAM: Good question. The *Amoco Cadiz* wasn't that sort of crisis. I don't know what should be done - that's what will surprise you the most - I

act by instinct. It's true that we were lost when we arrived there. I was dumbstruck. Thinking, "What am I going to do? What am I going to do?" My cabinet director said, "You have to see the mayors, that's for sure, and then you have to see the press. Then we'll think." Afterwards, I got a sense - I get a sense. But that's what's bad about my approach. Because if you don't get a sense for it - it's like a hunting dog that doesn't sense the game.

RICHARD THORNBURGH

# Three Mile Island

March-April, 1979

## Background

On Wednesday, March 28, 1979, shortly after 4:00 am, the accidental process began which was to trigger the first major crisis in the civil nuclear industry: Three Mile Island, Pennsylvania. The incident provoked a chain reaction of problems on technical, psychological, and organizational levels.

- On-site, the technicians were overwhelmed. "I would have liked to have thrown away the alarm panel. It wasn't giving us any useful information"[1]. "I think that the general consensus throughout the whole first day was (i) nobody really knew what was actually happening and (ii) some that had an inkling of what was happening didn't really want to believe what was going on"[2].

- The federal Nuclear Regulatory Commission, or NRC, and its specialists were equally in the dark. "I had sent a team of people up Thursday, and... they fell into an Einsteinian black hole. It was practically impossible to get good information from the site... My recollection... is we would get information after the fact, and then in the course of trying to figure it out, something else would have happened. And we were always chasing the problem rather than being in front of it," stated Harold Denton, NRC nuclear reactor regulation director[3].

- The Governor, for his part, was receiving absolutely contradictory advice from the federal offices of the NRC (telling him to prepare to evacuate 1 million inhabitants without delay) and the local NRC (telling him to do nothing of the sort)[4].

Add the facts that radio stations broadcast information before many officials in charge could be informed; that the utility operator lost all credibility in its first press conference; that evacuation plans were not operational ("the state plan was thought inadequate, county plans were limited and local plans were non-existent" [5] - and it becomes apparent that many factors

1. Report of the President's Commission on the Accident at Three Mile Island, New York, Pergamon Press, October 1979, p. 92-93.

2. President's Commission on the Accident at Three Mile Island, Report of the Office of Chief Counsel on the Role of the Managing Utility and its Supplier, October 1979, p. 207.

3. President's Commission on the Accident at Three Mile Island, Report of the Office of Chief Counsel on the Nuclear Regulatory Commission, October 1979, p. 206.

4. President's Commission on the accident at Three Mile Island, Report of the Office of Chief Councel on Emergency Preparadness, October 1979.

5. *Ibid.*, p. 2.

for a crisis were suddenly brought together. The system's foundations were shaken. "We are like blind men staggering around," declared NRC Commissioner Joseph Hendrie[1].

The following is an account given by Richard Thornburgh, then Governor of Pennsylvania. This is an adaptation of the Governor's speech given at the first international conference on industrial crisis management, organized in September 1986 by the Industrial Crisis Institute in New York. (Like the other texts, it was submitted to the interviewee in order to receive his corrections.)

## *The chronology of the crisis*

As a governor in office only 72 days, only one thing was on my mind at 7:50 on the morning of March 28, 1979: securing passage of my first budget. At 7:50 am, however, a telephone call from the state director of emergency management interrupted a working breakfast devoted to the fiscal plan. There had been an accident at the Three Mile Island nuclear power plant, located just ten miles downstream of us, in the middle of the Susquehanna River. I knew immediately that our agenda was about to be rudely amended.

### *Day One*

That was seven years ago. We know now that while some of the reactor fuel heated to the point of melting, a disastrous "meltdown," as suggested in the popular movie "China Syndrome", would be avoided. We know now that while detectable amounts of radiation escaped into our air and water, and even into our milk, during the days of tension that were to follow - the amounts were limited and their impact on public health, if any, remains debatable. And we know now that a massive evacuation of the up to 200,000 people residing in the area would have been far more dangerous than was the accident itself.

But when I answered the phone at 7:50 on that March morning in 1979, we knew none of this. Nuclear power was still the technological marvel of our time - to some the ultimate answer to our growing energy problems - and an industry whose safety record had been second to none. Nuclear jargon was a foreign language to me, and my exposure to emergency management at a nuclear power plant was limited to a perfunctory briefing just after taking office. I knew enough, however, that the thought of issuing a general evacuation order first entered my mind at 7:50 that morning and never left me through the unprecedented days that followed.

On the first day, it was not yet clear that the governor would have to manage the civilian side of this crisis personally, but it was very clear that a new administration, with ultimate responsibility for public health and safety, had better start asking questions, analyzing the answers, and preparing for the worst.

1. Dorothy Nelkin, "Some Social and Political Dimensions of Nuclear Power: Examples from Three Mile Island", *The American Political Science Review*, vol. 75, N°l, March 1981.

Because we were so unfamiliar with the existing state bureaucracy, and because there simply was no state bureau of nuclear crisis management, as such, let alone a precedent to study, we did something at the outset which was to serve us very well. I assembled what might be called an "ad hocracy" - a team of close associates whose judgment and competence I could trust absolutely, and a support group of relevant state specialists whose judgment and competence were about to be tested under pressures none of them had ever known before. The ad hocracy included, among others:

- My lieutenant governor - who would head our fact-finding effort in the early stages of the accident.
- My chief of staff - like me, a former federal prosecutor, whose instinct for asking the right questions of the right people at the right time served us admirably throughout the ordeal.
- My secretary of budget and administration - who would evaluate the state's existing emergency management apparatus.
- My director of communications, along with my principal speechwriting assistant, both of whom, as former reporters, shared an instinct for gathering and analyzing facts, as well as putting them in language the public could understand.
- And of course the specialists: the director of the bureau of radiation protection, the secretaries of health and environmental resources, the director of emergency management, and various others.

The ad hocracy reported to me only periodically at first, between other pressing, but somewhat normal, affairs of state. At the outset, I believed it was important to conduct business as usual in the governor's office, and perhaps even more important to appear to be doing so. As the implications of the accident became more apparent, however, I began to cancel other appointments, and the ad hocracy virtually moved into my office.

Our first task was to find out exactly what was happening at the site of the accident. Trained both as an engineer and as a lawyer, I had a well-developed respect for the integrity of facts, and I instinctively demanded much more of my sources than opinion, conjecture, guesswork or contradictory allegations. I wanted the facts as well as they could possibly be determined and as quickly as they could possibly be assembled. In the case of TMI, this would prove to be far more difficult than any of us imagined.

The utility, its regulators and other groups and institutions appeared to be contradicting each other, or telling the public either less or more than they knew. Self-appointed experts began to exaggerate either the danger or the safety of the situation. The credibility of the utility, which first seemed to speak with many voices, and then with none at all, did not fare well. The company began the first day by seeking to minimize the accident - assuring us that "everything is under control" when we later learned that it wasn't, and that "all safety equipment functioned properly" when we later learned that it hadn't. And even when company technicians found that radiation levels in the area surrounding the island had climbed above normal, the company itself neglected to include that information in its statement to the public. The

company had also vented radioactive steam into our air for about two and a half hours at midday, without informing the public.

It fell to us, then, to tell the people of central Pennsylvania, as the lieutenant governor did at a 4.30 pm press conference, that "this situation is more complex than the company first led us to believe," that there had indeed been a release of radioactivity into the environment, that the company might make further discharges, that we were "concerned" about all of this, but that off-site radioactivity levels had been decreasing during the afternoon and there was no evidence, as yet, that they had ever reached the danger point.

Although we continued, throughout the crisis, to monitor what utility officials were saying, we began to look elsewhere for sources of information who would be more credible to the public, as well as helpful to us. Among others, we turned to federal engineers and inspectors who had spent most of the first day inside the plant. Three of these experts joined the lieutenant governor in a 10.00 pm press conference that was to put a long Day One to bed for most members of the ad hocracy.

I was an exception. Delaying a deep, comfortable and much-needed sleep, I recalled reading a book entitled "We Almost Lost Detroit," an account of the potential consequences of core damage at the Enrico Fermi nuclear power plant in Michigan. Later, this type of catastrophe came to be popularly referred to as the "China syndrome". Ironically, the movie by that name was running in Harrisburg area theaters that very week, and its script incredibly described a meltdown as having the potential to contaminate an area, and I quote, "the size of the state of Pennsylvania."

I did manage to get to sleep that night, but I began Day Two with my new skepticism toward the experts and the industry fully intact.

*Day Two*

As the authors of a specially commissioned report were to write much later, the second day of the crisis was an "Interlude... a good time for Members of Congress to put in an appearance," which, of course, they did.

Chairman Joseph Hendrie of the NRC, meanwhile, was telling a congressional committee in Washington that we had been "nowhere near" a meltdown, although he had no way of really knowing this at the time. The company was holding its first full-fledged press conference since the accident and telling reporters that the plant was "stable" and that the controlled release of radioactivity into our atmosphere should soon be terminated. There seemed to be a feeling among those in charge that the worst of the accident was past.

I wanted to believe that, of course, but I was not so sure. Company efforts to cool down the reactor were not working as well as expected, and self-appointed experts and questionable eyewitnesses continued to feed us unsubstantiated stories about dead animals, along with exaggerated warnings, and a ridiculous tale - prompted by a poorly-worded NRC press release in

Washington - of radiation so powerful that it was penetrating four feet of concrete and spreading across the countryside up to 16 miles from the plant.

There were also signs popping up in grocery store windows proclaiming, "We don't sell Pennsylvania milk."

Public faith in the experts and institutions was beginning to erode, and it was clear that the credibility of the Governor's office was to become much more than simply a political issue for its occupant. That credibility was to become, perhaps, the last check against a possible breakdown in civil authority and the chaos and panic such a breakdown would surely ignite. Obviously, we were determined to preserve that check.

The time had come, I felt, for the state to become more visibly active and to use whatever credibility we had maintained to put things back into perspective - to establish, in other words, that the situation was not as bad as some would have us fear, nor as good as others would have us believe.

Let me emphasize that we did not run to the capitol media center with every doomsday alarm, off-site rumor, pseudo-scientific finding or even credible piece of information that crossed my desk. We took our lumps from the media, in fact, for alleged "inaccessibility," because we spent hours and hours cross-checking one source against another and testing all our information for truth, accuracy and significance. Once we did go public, even the grumpiest of reporters acknowledged that they had, indeed, come to depend on us for the truth about what was going on and what it all meant.

While I did continue to seek advice and briefings from federal people working at the site, I sent our own state experts on radiation and nuclear engineering to the island to supplement and cross-check what we were being told. On their assurance that it was safe to do so, I also asked the lieutenant governor to go into the plant and bring back what was to become the first authentic layman's report on what it was like in there. I wanted to know if the company technicians themselves were in a panic, and his description of the workers as calm and cool was reassuring, to say the least. The mere fact that the lieutenant governor had actually gone inside the plant at that particular time was perhaps even more reassuring to our citizenry. Finally, we all agreed, it was time for me to become publicly involved in the effort.

That afternoon, I opened my first press conference since the accident began, and I addressed my remarks directly to our people. "There is no cause for alarm," I said, "nor any reason to disrupt your daily routine, nor any reason to feel that public health has been affected by the events on Three Mile Island. This applies," I said, "to pregnant women, this applies to small children, and this applies to our food supplies... While we believe the danger is under control at this time, we recognize that it is very important that all of us remain alert and informed. We will... do so."

My briefing to the press that day was followed by one of the experts from the NRC - a staffer who declared, to my astonishment, that "the danger is over." I learned later that night that another on-site expert privately disagreed, and that water samples indicated that "core damage is very bad."

While Thursday ended on this somewhat edgy note, it was a mere prelude to a Friday I will never forget.

*Day Three*

Friday was to become known as the day of the great evacuation scare - the day that illustrated not only the folly, but the very real danger of trying to manage this kind of an emergency by long distance.

It began, once again, in the early morning hours, when the shift operators at TMI were alarmed by a build-up of steam pressure on a valve. Without approval from anybody, they simply opened the valve and allowed the steam, along with a substantial amount of radioactive material, to escape into the atmosphere. Helicopter readings taken directly above the plant's exhaust stack, indicated a radiation exposure rate of 1200 millirems per hour - a rate certainly high enough to warrant an evacuation, if the readings had been taken in nearby Middletown, in Harrisburg - or anywhere off of the plant site itself. But coming directly out of the stack, where the materials were immediately dispersed, such a reading was no more significant than those taken on the previous two days of the crisis.

Unfortunately, in a classic manifestation of what I call the "garble gap" between Harrisburg and Washington, the NRC's Washington-based Executive Management Team thought that the readings had, indeed, been taken in an off-site area and decided to recommend that we evacuate all residents within a five-mile radius of the plant.

Also unfortunately, this Washington group forwarded its recommendation up to us through our emergency management director instead of our radiation protection director - the latter of whom could have corrected the error and spared central Pennsylvania from reaching the very brink of panic. And even more unfortunately, the emergency management director called a local civil defense director, who called a local radio station with the news that an evacuation order from me might well be imminent.

I had yet to be so informed.

When the word finally did get to me that a "Doc Collins" from Washington was saying we should evacuate, I had no idea who he was or for what reason he was making such a recommendation - and I did not intend to evacuate thousands of people on such incomplete information. So I started asking questions, and my difficulty in getting answers was compounded by the jamming of our switchboard - thanks not only to the premature disclosure of an erroneous evacuation advisory, but also by the mysterious tripping of an emergency siren that soon had hearts pounding all over the city.

People were throwing their belongings into trucks and cars, locking up their shops and homes and packing to get out of town. If ever we were close to a general panic, this was the moment. I placed a call to the NRC chairman himself, and by the time I reached him, his staff had discovered what my own radiation experts were telling me: that the evacuation advisory was a mistake. The NRC group withdrew that advisory, and I immediately went on the air to

assure our people that the alarm was a false one and that there would be no general evacuation.

Shortly after that, I was on the phone with President Carter. Our two staffs had put aside partisan interests in dealing with this crisis. My conversation with the President was therefore honest, open, direct, and above all, productive. I asked for, and the President agreed to send us, a high-ranking professional who would go to Three Mile Island as his personal representative, merge solid technical and management expertise with an on-site perspective, and report accurately and directly to the White House, to me, and to the people on what was and was not going on out there, and why.

Harold Denton, the NRC's director of nuclear reactor regulation, turned out to be the perfect choice, and his arrival later in the day would represent a turning point in the crisis. For the moment, however, the evacuation question was not entirely settled. While relieved that a general evacuation was unnecessary, we were deeply troubled by the confusion which that episode exposed in Washington, as well as in the plant, and by the uncertainty over what might happen next.

We began to wonder on our own if pregnant women and small children, those residents most vulnerable to the effects of radiation, should be encouraged to leave the area nearest the plant. We decided to put that question directly to Chairman Hendrie, who answered, "If my wife were pregnant and I had small children in the area, I would get them out, because we don't know what is going to happen."

Shortly after noon on Day Three of the crisis, I therefore recommended that pregnant women and preschoolers leave the area within five miles of the plant until further notice, and that all schools within that zone be closed as well. I also ordered the opening of evacuation centers at various sites outside the area to shelter those who had no place to go. "Current readings," I told the people, "are no higher than they were yesterday, but the continued presence of radioactivity in the area and the possibility of further emissions lead me to exercise the utmost caution."

Harold Denton arrived at the plant that afternoon. A three-way hotline was installed there to connect him with me and with the President. Later that night, Harold and I met for the first time and spent an hour and a half reviewing the situation.

It was quite clear that his slow and relaxed North Carolina drawl, his way of smiling naturally as he spoke, his ease and apparent candor with the press, his ability to speak plain English as well as nuclear jargon - all of these factors soon were to make him the world's most believable expert on the technical situation at TMI.

While he was on his way up to Pennsylvania, his colleagues in Washington referred publicly to the theoretical possibility of a meltdown, an accurate but poorly handled statement which caused even that most credible of all Americans, Walter Cronkite, to lead the CBS Evening News by saying, "We are faced with the remote but very real possibility of a nuclear meltdown at the Three Mile Island atomic power plant."

Harold Denton joined me in a press conference that night, put the facts in perspective, lowered the level of concern, and earned his spurs with the press - and with me. While we did continue to cross-check his observations against those of my own team, we quickly became convinced that he was as credible as he appeared to be.

As Day Three wound down, I felt we were finally equipped to handle the mis-statements, second guessing, and false alarms that were certain to continue.

*Day Four*

Harold Denton's long series of regular press briefings in Middletown, near the plant site, began on Day Four, Saturday, March 31. Those briefings did serve to keep things relatively calm, and I felt it safe to leave Harrisburg for the first time since the accident. I wanted to visit some of the people who had spent the night - at my advice - on cots and blankets covering the floor of a sports arena in nearby Hershey.

As I walked through what amounted to an indoor campground, I was met by the anxious faces of young mothers and mothers-to-be and the tired eyes of children who had fallen way behind on their sleep. I gave them a brief pep talk over a shaky public address system, and thanked them for their confidence, for their cooperation, and for their bravery. It was there that I resolved to do all that I could, for the remainder of my term, to see that neither human nor technological error on Three Mile Island would ever be allowed to threaten these people again - a commitment that was to consume an inordinate amount of my time, even to this very day.

As for March 31, 1979, however, human and technological errors were to provide yet one more scare for these good people. Based on information given to it by an anonymous NRC source in Washington, a wire service ran a news bulletin that night that read, and I quote: "U-R-G-E-N-T... The NRC now says the gas bubble atop the nuclear reactor at Three Mile Island shows signs of becoming potentially explosive..."

This fear was totally groundless. The hydrogen bubble could never explode in the reactor vessel. As one review of the crisis later recalled, "It would blow up, instead, in the media." The bulletin, in its most cryptic and chilling form, moved like a hurricane advisory across the bottoms of prime-time television screens everywhere that Saturday night, hi Harrisburg, people streamed out of downtown bars and restaurants. Our switchboard jammed again, and a herd of reporters stampeded into my press office - not for the story itself, but demanding to know if they should get out of town.

Obviously, we had to move fast. We called Harold Denton at the plant and learned that there was no danger of an imminent explosion and no cause for alarm. My press secretary, skipping our normal clearance procedures, banged out a three-paragraph statement to that effect and literally ran it down to the capitol newsroom. Concurrently, we asked Denton, who was on his way to my office, to go directly to the newsroom instead, which he did. Within

minutes, stories quoting our statement, and then Harold's impromptu news conference, began to move on the wires, and another potential panic seemed to have been avoided.

In the course of this "bubble" drill, we had been in touch with the White House and discussed the possibility of a visit to the area by the President himself. Press Secretary Jody Powell authorized me to say that the President would, indeed, be joining us in the near future. Powell issued a similar statement out of Washington. That was to be, in effect, the end of the panic-avoidance phase of our crisis.

*Day Five*

The President arrived the very next day, and he and I toured the plant together - in full view of network television cameras. The image that was beamed around the world on April 1, Day Five of the crisis, had its desired effect. If it was safe enough at Three Mile Island for the Governor of Pennsylvania and the President of the United States, it had to be safe enough for anyone.

Over the next several days, Harold Denton continued to oversee the cooling down of the reactor core and offer progress reports to a press contingent that was fast losing interest in the story.

On April 6, just ten days after that fateful opening of what had become the most famous power plant valve in the world, I prepared to tell our people that the crisis had been passed, and that those who had chosen to leave the area "can, indeed, come home again."

## *Lessons Learned*

l.The first among these lessons is to expect the unexpected and be prepared to adjust accordingly. If it isn't Three Mile Island, it will be three-mile gas lines. It it isn't a water shortage, it will be a flood. If it isn't a transit strike, it will be a subway crash. If it isn't an underground mine fire, it will be a prison hostage crisis... Upon taking office, any governor should make sure not only that the state's existing emergency apparatus is adequate, but that good men and women are in place to handle the administration's planned agenda as well, should the chief executive become occupied by an item that was never planned at all.

2. When an emergency does strike, organize an "ad hocracy" in which you can have complete trust. It was not in our job description to function like a virtual grand jury, grilling witnesses to a nuclear emergency, and then to serve as a communications center for the people, but it worked. A chief executive should not be afraid to scramble the organization chart, as we did during Three Mile Island - or, in a perhaps more familiar example, as President Kennedy did during the Cuban missile crisis, when his own

brother's advice weighed more heavily with him than that of the Secretary of State or the Joint Chiefs of Staff.

3. Don't fall into the trap of action for action's sake. Be ready to restrain those who may be "leaning forward in the trenches" and thinking solely in terms of "doing something." This applies not only to emergency volunteers and staff, and not only to emergencies, but to bureaucrats, technocrats, academicians, medical and other professionals, and, yes, even to my colleagues in politics as well. The impulse in government to act merely for the sake of action, or to test a plan or agency simply because it is there, must be kept firmly under control.

4. Be wary of what might be called "emergency macho" - the temptation to stay up all night and then allow the press staff to brag about it. While it is often important for the governor to maintain a visible and reassuring presence, anyone making life-or-death decisions for thousands of innocent people owes those people a mind that is clear and a body that is rested.

5. Don't try to manage an emergency from anywhere but the site itself. This does not mean that the governor must be on-site personally, but someone must be in charge there whose competence and judgment the governor can trust. Most of our communications problems originated in Washington. Even Harold Denton, I later learned, had been a major participant in that bogus evacuation advisory the NRC sent up to us on the third day. Harold later was to concede that "I've learned that emergencies can only be managed by people at the site. They can't be managed back in Washington."

6. Search for and evaluate the facts and their sources, and communicate those facts truthfully and carefully to the people. Remember that credibility can be as fragile as it is crucial in the heat of a genuine public emergency.

7. Respect but do not depend on the news media. Throughout the TMI incident, we developed a considerable empathy for the more than 400 reporters from around the world who were assigned to cover this event. Their frustrations mirrored ours in the attempt to establish reliable facts. In many instances, our decision-makers and the members of the media "compared notes" on vital issues to ensure both the quality of the reporting and the quality of action within state government.

Not all of the reporting was reliable, however, and some was downright outrageous. For example, I was informed that a British news organ, in its attempt to convey the gravity of the situation, carried an item to the effect that "the Governor's wife, pregnant with their first child, has left the area." In fact, my wife was not pregnant; we already had four children, and, most importantly, she stayed with me in Harrisburg during the entire episode, as did the Lieutenant Governor, whose wife, incidentally, was pregnant with their very first child, and who also stayed with him.

8. Forget partisanship. There is no Republican or Democratic way to manage a real emergency.

9. Value and learn from history. Reports, analyses, and testimony on this type of situation should be edited and published. While the Fuller book on the Fermi plant proved useful, let me assure you that if one of my colleagues had

already experienced a nuclear emergency like TMI, and had recounted it in published form, such a publication would not long have lingered on my shelf.

10. Don't stop managing the crisis until it's over. The year after the accident, I had to step into a new furor over a plan to vent radioactive krypton gas into the atmosphere as part of the TMI cleanup operation. Public hearings on the safety of the plan almost turned into riots. One imaginative opponent of the krypton venting put on a Superman suit and proceeded to "choke" himself on the front steps of the capitol.

I took the unorthodox step of asking the Union of Concerned Scientists, a well-known group of nuclear industry critics, to study the venting plan. When that organization concluded that it posed no physical threat to public health and safety, the venting proceeded peacefully. The year after that, however, we learned that no plan had been devised to fund the billion-dollar effort necessary to decontaminate the damaged reactor. Because the site cannot be considered truly safe until that cleanup has been completed, and because the established institutions were at an impasse, I had no choice but to develop and push a national cost-sharing plan for its funding, a plan which is now in the implementation stage.

Thanks to this "shakedown cruise" we learned whom we could depend on to do good work under pressure in state government, and we learned it in perhaps a tenth of the time taken by most new administrations. We were re-elected. Even today, however, the cooling towers of TMI continue to represent a greater demand on my time than I ever imagined possible.

Of course there is one final postscript. In December of 1979, some eight months following the accident, I visited the Soviet union and met in Moscow with top governmental and scientific leaders in their nuclear energy program to share with them some of the lessons of Three Mile Island, or as our translator called it, "Five Kilometer Island." To our discomfort, they told our party that they regarded nuclear safety as a "solved problem" and that the problems raised by our experience had been "over-dramatized." They even quoted the head of their national Academy of Science as saying that Soviet reactors "would soon be so safe as to be installed in Red Square."

DOUGLAS K. BURROWS

# The great Mississauga evacuation

November 10-16, 1979

## Background

"There's been a large explosion and fire on Mavis Road." That was the radio message broadcast by a Peel Regional Police Force patrol officer at 11.53 pm, Saturday, November 10, 1979. It marked the beginning of the largest evacuation in recent history, masterfully handled by the Canadian authorities and more particularly by the Peel Regional Police Force, assisted by the Ontario Provincial Police, the Metropolitan Toronto Police, and the Royal Canadian Mounted Police. Together, they evacuated 217,000 persons, 75% of the population of Mississauga, a city located on the north shore of Lake Ontario to the west of Metropolitan Toronto.

The incident began shortly after 11.50 pm, when 24 cars in a two-kilometer-long freight train (106 cars, three engine units) derailed. Twenty-two of the cars contained chemical products, including caustic soda, propane, toluene, and styrene. One of them, damaged and leaking, was filled with chlorine - though this was only established hours after the beginning of the catastrophe. At midnight, when intervention forces arrived on site, they were faced with a gigantic inferno and powerful explosions that were tossing tankers up to 700 meters in all directions. No one knew what was in the cars: the train's manifests were illegible. The conductor ensured the authorities that the chlorine tanker was not in the inferno, but was later to be proved wrong.

Many individuals and agencies participated in the operation. The Mississauga Fire Department was fully responsible for fighting the blaze. The Red Cross took care of the evacuated persons. Metropolitan and provincial ambulances supervised the evacuation of hospitals and nursing homes. Mississauga Transit also made its contribution, and experts on chlorine and propane were called in.

This operation is noteworthy for its gigantic scale, its complexity, and its contradictions. Among them: on site, the propane experts strongly recommended hosing the blaze heavily to cool down the propane wagons - while the rule of thumb for the experts preoccupied by the chlorine tanker, also in the flames, was to avoid using water, which would cause greater evaporation of "their" toxic gas. The same went for the hospital evacuations: these could be done in four hours -but at best, it would be possible to give only twenty minutes' notice. This meant decisions had to be made on uncertain grounds, by comparing the risks of keeping people where they were to those of evacuating intensive-care patients.

We spoke about this case with Douglas K. Burrows, Chief of the Peel Regional Police Force, who directed emergency operations. He shared his experience as the general coordinator of a gigantic operation that was to last a week and that remains a model in its field.

We chose, however, to go beyond the specific Mississauga incident and discuss basic problems in handling crisis situations.

P.L.: It is striking to see how fast your forces were ready and available. But how did you yourself enter into the event? How have you organized a response on such a scale?

D.K. BURROWS: Because I am the Chief of Police, I am called during any major event even though I may not necessarily be required. I am informed of the incident, and I have to assess the scope of the incident and whether a sufficient number of people and agencies have been called in, as well as whether my personal direction is needed. In this case, there was an obvious potential for a large scale disaster. I was called in - because of the scope of the incident, and because I had played a large part in disaster planning over the years. I was the one who initially started planning in this area, as far back as the early sixties. I was concerned primarily about aircraft disasters, as the Toronto international airport is in our jurisdiction.

So I was called at home, just after midnight, shortly after the incident. I felt I had to get to the scene fast and also help alleviate some of the problems in our communication system - so I called the deputy chief myself. I picked him up on the way down, so we arrived together. We assessed the scene quickly, and the very first thing I did upon arrival was to assign one of my senior officers (he was my executive officer and I knew he was experienced) to handle the media people who would be converging on the scene. I knew there would probably be hundreds of them, and it would be very important to have them under control, so that they not interfere or go where they ought not to.

Then I went right to the temporary command post. That is also part of the plan, to have an area already set aside where some initial plans can be made. I wanted to know all the details they had of the incident, to see the manifests from the train, and to speak with the conductor. I didn't particularly like what I saw; what I was being told didn't tie in with the evidence. The conductor told me the chlorine tanker wasn't in the fire or the derailed portion of the train, and yet when I asked him to point out on the map just where it was, there seemed to be some lack of clarity. I therefore asked a team of officers to go out and check each of the remaining cars, and of course they were not able to locate it. So we deduced it was in the derailed portion. I also thought we could detect some slight odor, and we knew that there were propane tanks in that area as well, so the potential for disaster was great.

As soon as I knew that the chlorine tanker was in the derailed portion, I asked for immediate evacuation of people down wind from the train. Actually, the wind was quite variable that night, so we just watched the smoke and evacuated accordingly. Eventually people came from the Ministry of the Environment to help us detect the wind direction exactly. My main concern was to determine whether the chlorine was indeed in the derailed portion, and next greatest concern was that the wind was starting to blow in the

direction of a hospital. I knew that the safe evacuation of a hospital would take some time to prepare. I called the hospital administrator, whom I happened to know, because I had worked on an investigation there once. He was quite shocked, though I believe he took it somewhat better coming from someone he knew, and he realized the evacuation was necessary. Furthermore, I had tremendous faith in the local ambulance services, because I had seen them operate before, for example in an aircraft disaster. I also had a lot of faith in the other police forces in the area, knowing they would assist if necessary.

P.L.: After this introduction, how did the situation - and your responses to it - develop?

D.K. BURROWS: We had to change command posts three times because of wind direction; eventually we found one that was suitable. Then we had several think-tank sessions there. By that time, eight or nine hours after the derailment, the politicians were arriving, from the provinces, the federal government, and the municipality. By then, several measures had already been taken, and in fact these arrivals became problematic: there were of course people who had expertise and experience, but then there were those who did not!

This is a crucial point. If we learned one thing there, it was that in such a large scale operation, you must separate those with responsibility and expertise from those without. Everyone wants to be in the think-tank sessions, but that simply isn't possible, because it slows down the decision-making process. We were able to solve the problem, because the Attorney General [the highest-ranking official involved in the operation] was a competent man, and he could see why we asked him to limit the number of participants.

P.L.: And that's a fundamental question: who should be in charge in a crisis? A political figure? A high-ranking member of the administration?

D.K. BURROWS: That's an important point that should be decided ahead of time. In my opinion, it should be the police [in Canada, the police has broad powers in the area of emergency management], because they are the people who usually have experience and responsibility as well as the necessary personnel and communications. Also, they are trained to deal with different areas. It's best to have someone from a senior position in the police force, working together with a senior government official and perhaps someone from the municipality. The most important thing, however, is cooperation. You don't want people converging on the scene just to get their names in the papers.

The next point is to assign people to deal those who are not in the think-tank, and especially with the media. You should have a place set aside for them, where they may be informed but kept apart from the people in the think-tank.

The same goes for politicians without responsibilities. The politicians are naturally in a difficult position, as the media always descend on them, trying to get whatever information they can out of them. A police officer should

look after them, like the media, but not allow them to have access to the think-tank unless it was clear they had some responsibility or expertise. In most large-scale disasters, you're going to have a great many people arriving whom you're not prepared to receive. You don't have time to be bothered with people who are there just to see or be seen. You must have people assigned to look after them and give them as much information as you can. You can't have people walking in and out of think-tank sessions and then speaking to the media, because information that reaches the media this way can be inaccurate and cause panic.

What we therefore decided was to have at least one session every day when all of us - the Attorney General, the city mayor, and myself - would answer questions for press releases. And of course, if there was any further information afterwards, we would have the liaison officer pass it on. This is very important, because inaccurate information can cause grave problems: for instance, causing people to return to their homes too soon after an evacuation. Usually, if the media realize you're giving them as much information as you responsibly can, they will be responsible themselves. There is naturally the odd exception, but in general we've found that to be the rule. At Mississauga, we even allowed them to take photographs, but all the while escorting them or controlling where they went.

Let me add a few general remarks. I must stress the importance of:

- having a plan and making sure that all your officers know it. In our system, knowing the plan and understanding it is part of the promotional exams, so that motivates officers to learn it;
- having good liaison with other agencies;
- if possible, holding mock-disasters, since all disasters relate to one another in terms of plan, control of the media, and so on.

P.L.: But all the same, the sudden shift into a situation on the scale of Mississauga must be a real psychological shock for the person in charge.

D.K.BURROWS: As a police chief or senior officer you have very broad responsibilities which can include saving lives. But that's just part of your job, so you do it. The public expects it of you. For the average person, such situations might cause a lot of stress, but of course in our case the conditioning helps. From the time you begin your police training, you come into contact with stressful situations.

In contrast, you may have people in responsible political positions who haven't had any prior experience in handling serious incidents - they may even break up under the stress, knowing that thousands of lives depend on their decisions.

As far as our officers are concerned, we come to know them over the years, so the ones we know couldn't handle the stress of major decision-making, we keep in lesser roles. But of course, it doesn't work that way with government officials.

P.L.: When we speak of panic, we tend to think of the man in the street. But of course you might find a heavy dose right within the think-tank.

D.K. BURROWS: That's why it's important to have a large organization like the police in charge, who are used to dealing with lesser incidents on an everyday basis. You have to have people who know how to follow the tide, keeping things smooth. You must have people around who can make decisions, even if they're the wrong decisions. On a smaller scale, a police officer who goes out to apprehend an armed individual knows he faces the possibility of being shot at. The same thing goes for decision-making on a larger scale.

In the same way, politicians who arrive on the scene of an incident shouldn't take the responsibility away from the police - they should work with them. After all, the police have the manpower and the organizational structure. Just as you wouldn't expect a government official to come in and start commanding the military, you shouldn't expect this to happen to the police.

P.L.: Let's get back to the media: how can you be sure that they'll serve the purpose of distributing information and not spread fear and confusion - in the case of an evacuation, for example?

D.K. BURROWS: It's important to give the media as much information as you can without causing panic. You should explain to them that they, too, are in a position of responsibility, that they could all be accountable if they gave people inaccurate information. Of course you'll always find somebody who acts irresponsibly, but in general, if you explain the situation to the media, they will cooperate, knowing that the eyes of the public and their peers are on them.

For example, in 1972, I was in charge at the airport during a hijacking. I told the media that I would give them information as soon as I could. (I was in fact very busy dealing with the terrorists.) I said as soon as I could make sure the hostages were safe, I would give them a press release. (It's also very important to follow up on your promises and give the media the press release when you promise it, or else they will never trust you again.) Most of the journalists cooperated, but two of them tried to sneak out to the plane - we arrested them, of course.

P.L.: Didn't that provoke a general outcry?

D.K. BURROWS: No, the others were aware that there had been a potential for disaster when those two headed towards the plane with their cameras.

P.L.: More generally, how do you determine your media policy? Suppose, say, that there's a fire in a chemical plant. Large amounts of water are used to put it out, and some of the water runs off, threatening to contaminate the drinking water. The problem is, it will take a few days to test the water and know for sure. What do you tell the media?

D.K. BURROWS: I would tell them that the public should not consume or go near the water until further notice.

P.L.: But you might run into resistance from public officials saying, "The risk is minimal, you're blowing things out of proportion."

D.K. BURROWS: I don't care, because I don't have to win votes. This is precisely why it's good to have the police in charge: when they make a decision, it isn't based on what's popular, but on what they think is safest for the public. There is a good example in the movie "Jaws": there's a scene where the police officer wants to close down one of the beaches, because he thinks somebody has been attacked there by a shark. The mayor of the town is naturally opposed, since the town is a great tourist center. The police officer doesn't have to worry about popularity - he can do what is safest for the public.

P.L.: Now suppose, in the case I mentioned, that the laboratories tell you it will take two weeks to know whether the water supply is safe. Can you hold your ground?

D.K. BURROWS: Most communities could survive, at least in the western world. There would be enough water or substitutes in stores.

P.L.: But what would you tell the press?

D.K. BURROWS: As far as journalists are concerned, it's important to give them accurate information, but this does depend on the circumstances. To avoid panic, the information must be given out in an orderly fashion, neither too soon, nor too late.

P.L.: Do you have a clear idea of what not to do?

D.K. BURROWS: It's very difficult for anybody to be entirely clear on that sort of issue. Everything comes back to trying to give the public as much advance notice as possible.

P.L.: In terms of carrying out an evacuation, what are your thoughts based on your experience in Mississauga?

D.K. BURROWS: In operational terms, you have to have ready access to roads and transportation, and have plans set up with other agencies. If you have a spill like chlorine, there isn't going to be much time to evacuate, and you must prepare for eventualities like congested traffic. The sooner you evacuate, the better, because this decreases the panic. One of the problems with an event like a nuclear disaster is that people are very aware of the danger they might be in, so in evacuating, it's much harder to control the situation. But in any case, a large-scale disaster is always hard to plan for.

P.L.: And how would you deal with conflicts among the people in charge?

D.K. BURROWS: When decision-making is going on in the command post, of course points of view are going to differ, and you can't just take into account your own! But I don't think there would be any problems of holding back information or disagreeing about whether or not to evacuate. In most cases, the police and the politicians are going to agree on such points.

That much said, you have to realize that the initial assessment of the situation is of prime importance - and sometimes, in the first instants after a disaster, you're the only one there, and you must follow your own intuition. That's why the more experience and conditioning you have, the better. You can put your plan into action, you can rely on your personnel, you call up different agencies.

P.L.: Suppose you are called in to advise and assist an outside authority in handling a catastrophe. How would you proceed?

D.K. BURROWS: If you put me in charge in a city I didn't know anything about, I wouldn't know if a plan existed or whether it had ever been tried, let alone whether the personnel knew about it. In a case like that, you must work together with the person who knows what resources are available and perhaps give him a few pointers based on your own experience. But one thing you should never do is make assumptions. For example, if I had believed the people who said the chlorine tanker wasn't in the derailed portion of the train, a real disaster could have resulted. When you arrive on a scene, never assume what you are being told is accurate. Always check the facts as much as you possibly can, and then make your own decisions.

P.L.: In the case of a train accident, it seems reasonable to believe there wouldn't be a disordinate amount of conflict - but what about a nuclear accident, which touches a much more controversial field and can even lead to cross-border problems? You might be tempted not to give out that information, and that would actually lead to increased conflict.

D.K. BURROWS: The most important thing is to show that cooperation it what you're after - you don't want to dominate, you're just trying to do your best in a situation that could be dangerous for the public.

P.L.: But how do you respond to reactions of the type, "Evacuation is too costly, the measures you're calling for are disproportionate"?

D.K. BURROWS: We've had to close down businesses, and the law suits are still in the courts! But you can't worry about that. At the time, you are there to save lives. In a chlorine incident, you can't tell people to stay indoors, because you can't even drive through chlorine. So you must start evacuating as soon as possible. And of course we had people who wanted to go home sooner than we could let them, or who complained about certain highways and businesses being closed down, but the majority of the public realized that this was all done for their safety.

P.L.: So you stand up to anyone who would try to make you under-react. But on the other hand, isn't there a danger of over-reacting?

D.K. BURROWS: That is why it's important to put an organization like the police in charge, which has the manpower and the communications infrastructure, the experience and the conditioning. And of course, we also use a good deal of common sense in deciding what to do. When you make decisions, you have to know what resources you have available. If I decide to evacuate the hospital, for example, it's because I have tremendous faith in the ambulance services, and I know they can do the job. In other words, you have to know what your margin for manoeuvre is. Mock disasters are very useful tools for evaluating that. But in any case, it's better to take excessive measures than insufficient ones. Human lives are worth more than an extra budget expense.

P.L.: Now imagine you're in a situation where the danger is invisible. Some say it is very great, others say there is no risk. How do you act when there is no clear-cut state of emergency?

D.K. BURROWS: Again, hold to the principle of giving people as much information as you can. The average citizen is concerned about agencies' emergency plans and will pay some heed to the warnings that are given. In the case of radioactive fallout, for example, there are certain precautions you can start taking within your own home.

P.L.: And when scientific knowledge proves insufficient, or there are no regulatory norms.

D.K. BURROWS: We all have to rely on our experts and environmentalists to tell us what is safe and what is not. And the police have been conditioned for this to a certain extent. As for the public, most people are going to take precautions. In the Chernobyl incident, for example, people knew it was dangerous to eat certain vegetables or be exposed to rain. That's where the media can play a role: they can be used as a tool to instruct the public of immediate or long-term dangers - as they have done with smoking and the risk of cancer.

P.L.: If there were a meeting organized of people like yourself, who have been in charge of crisis situations, what topics would you like to see discussed?

D.K. BURROWS: The problem we face is that so much of modern technology can cause disaster (not to mention terrorists who have to be contended with!). It's important that the public be informed as much as possible, that people know of the existing agencies and their plans. This will also give them a certain amount of confidence when something does happen. Of course, some people put too much faith in agencies, expecting that they'll be able to handle everything. These are all points that should be discussed.

But after the discussions, you have to take action. I was very surprised to discover how many cities did not have disaster plans until the Mississauga incident - this seems to me to be something large cities should have. That means you should get together, coordinate agencies, enact mock disasters, and delineate boundaries of responsibility and authority to avoid confusion during the crisis.

And nations can help nations, too. It's almost an accepted fact that the Canadian and American police forces work together. Having people with different backgrounds and experiences come together is a good idea.

P.L.: Another thorny issue is whether the army should be called in in a post-accident situation. What is your opinion?

D.K. BURROWS: You have to be careful when you call in the military, because it is made up of a different type of person from the police (though in some countries, I know the police are in fact more militaristic than the army). In Canada, we are trained to interact with some humane understanding, and we teach our officers things the average soldier does not learn. In some countries, you have to be careful not to call in the military too soon, because it can be a problem in itself. We are always trained to protect the innocent

PÉTER-J. HARGITAY

# The Bhopal disaster

December 2-3, 1984

**Background**

On the morning of December 3, 1984, news of the disaster at Bhopal swept across Europe and the world. We will examine here how the communications system for Union Carbide Europe was set up to deal with this terrible crisis. Péter-J. Hargitay, founder of a very large group of European consulting firms (with offices in Amsterdam, Athens, Basel, Barcelona, Brussels, Budapest, Geneva, Lugano, London, Milan, Munich, Paris, Vienna, and Zurich) designed and ran the system. Less than three months before the events in question, Union Carbide had asked him to develop a general communication framework for the company. This work had barely started when the accident took place. As a result, Péter-J. Hartigay had to take on a personal role in managing the crisis, from the very first moments through the gradual re-building of the firm's image.

## *The shock*

P.L.: How did the horrific news about Bhopal first come to you?

P.-J. HARGITAY: I remember very well - it was a Monday morning, around 9 am, and I had just gotten to the office. I received a telex from our office in London: the BBC had just announced an accident in a Union Carbide plant in India, citing the figure of 25 deaths. That was serious, but it wasn't a colossal disaster. Half an hour later came a call from the office in Stockholm: a Swedish radio crew that happened to be in Bombay was citing 200 dead.

About 10 o'clock, I called the Union Carbide Europe headquarters in Geneva: nobody knew about it. (I didn't call the headquarters in Danbury, Connecticut, because it was 4 am there, but in fact, they were already on the alert.) In their 11 o'clock news flash, the Swiss radio stations also mentioned some 200 deaths. That was when I really began to be alarmed myself. I called Geneva back immediately - they'd heard the news, too. I informed them that they would have a crisis plan on their desks within thirty minutes (by fax).

With three of my staff, we drew up the crisis plan, which reached Geneva at around 11.30 am. It laid down a certain number of basic rules of strategy: no comment until a spokesperson had been named, except to say that they

knew about the event, that steps were being taken to alleviate the suffering of the victims, that they didn't have any further information yet, but that they looked forward to the best possible cooperation with the media, which would receive any information as soon as Union Carbide did. A terrible accident had taken place, an accident that could not be ignored.

Things escalated wildly very quickly. In the noon news bulletin, there was already talk of hundreds of dead. I immediately took the plane to Geneva. The problem in Europe was that, at the time, our client had no communications structure. What's more, the CEO for Europe was brand new and knew only a few people. And to top off our bad luck, he wasn't there - he was in Danbury on a routine business trip. Fortunately, he had a team of very qualified top executives.

Monday evening, the story was already widely covered by the press, even though nobody knew exactly what had happened. Some spoke of 50 deaths, others of 400. It was horrible. We accepted calls from the media, but we really knew nothing at all.

### *Ten days of madness*

The first hours were crucial: naming spokespersons, structuring the crisis center and implementing the basic communications policy, informing the media, providing in-house information.

One of the immediate decisions was to name four spokesmen. Why four? There was both a language problem and a knowledge problem. You have to realize that there are twenty nations in Europe, and twenty languages. So we named two generalists: one vice-president, who spoke fluent English and French, and myself for the other languages (I speak seven). For technical questions, there were two top-notch expert chemists who knew how MIC (the compound involved in the catastrophe) was produced.

By 8 am the next morning, we had already chosen our crisis room, a central room in the Geneva headquarters (to shorten the coming and going). There a blackboard was set up, on which I began by writing the rules that we were to observe scrupulously in responding to all questioners:

1. No contradiction among spokesmen.
2. No questions without answers: if we don't have all the elements, we promise to find the information and to call the person back - and we do it.
3. Generalist spokesmen never answer a technical question.
4. Mandatory politeness and maximum patience in all contacts.

It's worth taking a moment to look at this general communications policy. In this type of circumstances, everybody wants to be heard: you get calls from crazies who insist they've invented an antidote. But a priori, you never know if the person is really crazy, or a genius, or even somebody who may have it in for you. You can lose your mind. However, it is capital never to be arrogant with anyone - otherwise you are lost. That is a matter of psychology, and a simple question of respect for others. The key is, "There

are no stupid questions, there are only stupid answers." More generally speaking, you have to realize that what causes fear is a lack of information. Therefore the first goal has to be to try and inform people. Let me specify, not to calm them down, but to inform them.

The first step we took with regard to the outside world was to send a telex to some 800 European media, informing them that we were at their disposal, that the doors were open - that we couldn't answer all their questions, but that we hoped to satisfy their requests for information. This first step was very well received.

In terms of in-house communication, even though we didn't yet have any details about the accident, our first concern was informing Union Carbide's employees. Twice a day we sent them an "internal information report". We posted information in company cafeterias about how events were developing. This is a vital lesson: your priority is not the press, it is your own employees. Otherwise, you run the risk of things simply imploding.

To accompany information to the outside, with the first telex we set up a logbook in which we made a record of each telephone call, each request and each interview, minute by minute. We named two people - a chemist and an executive secretary - who did nothing but write down information about all the calls received in this logbook: when the call arrived, caller's phone number, contents of the reply, and so on. In the long run, this 300-page document proved to be exceptionally useful. In it we had the names of all the interested media organs, whether critical or positive. We were able to pursue our information effort for two years without a break - in fact, at the end, the journalists were even asking us to stop this flow of information (this might look like a cynical tactic of over-informing, but that wasn't our intention). In the short term, the log allowed us to evaluate, day by day, the mistakes we made, the list of people whom we hadn't yet called, those whom we hadn't been able to call back, and the points on which we lacked information. Creating this logbook drove us to advise Danbury several times a day of the subjects about which we needed more information.

I have to specify that questions where coming to us from India, where the clock is nine hours ahead of us. As strange as this may seem, we sometimes got news before Danbury, for several reasons: the time difference was smaller, we in Geneva had one of the leading specialists in MIC production, and we had extremely close ties with the media - who were also well informed, because of our very policy of openness. On the other hand, we had to work with Danbury, where the clock was six hours behind us. This raises an essential point in crisis management - having to master large, interconnected systems.

In Europe, we had to make two systems operate: the Union Carbide subsidiaries, which were present in 12 countries, and our own offices, located in those same countries. From Geneva, we answered the press. From Zurich, we coordinated the activity of our offices, which were in turn in contact with the Union Carbide branches. To guarantee a perfect coherency between Geneva and Zurich (where I had left one of my assistants), we set up an open

telephone line between the two sites (the receiver was never "hung up"). We in Geneva were in contact with the media; the assistant in Zurich was in liaison with the national offices of our group, which were in turn in contact with the Union Carbide subsidiaries. We were talking continuously, with a telephone in each hand.

P.L.: In those first hours, what was the distribution of the calls?

P.-J. HARGITAY: There were 40% from the different Union Carbide Europe subsidiaries; 40% from the media; 10% from industries and governments; and, what is phenomenal, 10% from public relations agencies offering their services.

P.L.: And how were your communications received?

P.-J. HARGITAY: First of all, I have to say that we were all working eighteen hours a day during those first two weeks - it was awful. But we told ourselves, "We want to do this, and do it right." For example, I gave five interviews to *L'Unita*, the Italian Communist Party newspaper. They never tore apart Union Carbide - they were surprised to have received a reply in Italian from Geneva, along with such solid follow-up information. The follow-up was worthy of Swiss clockwork. I could show you packets of letters from journalists congratulating us on the open communications policy followed by Union Carbide Europe - when at the same time, they were criticizing Danbury (this was the case with the *Frankfurter Allgemeine Zeitung*, for example).

P.L.: Was there less information in the United States?

P.-J. HARGITAY: That was the media's reproach. In reality, there was a daily press conference at the head offices.

P.L.: Wasn't the communications policy the same in the United States?

P.-J. HARGITAY: Not in the beginning.

P.L.: And the media there didn't cotton on to the difference?

P.-J. HARGITAY: No, not at all. Americans are interested first and foremost by what is happening in their own backyard. But I would like to emphasize another aspect of this media communication: the importance of being able to rely on an outside network. Through our offices and through our profession, we have a lot of friends in the media (real friends, not just acquaintances). We talk a lot, we share information back and forth. Those are atypical resources for a business. For instance, we knew very early on - before Union Carbide - that the Indian Red Cross had refused the $5 million that Union Carbide wanted to give to it (no strings attached), because one of my best friends works in a press agency, and one of his correspondents in Bombay had sent him that news.

An outside network can be very useful, even if the internal network is fantastic. But you should know that no company in the world has a fantastic internal network: I've covered too many crises to think otherwise. On the inside, they can't imagine it: In our company? How could this happen? You run the risk of being a little arrogant because you're blind and shut off from the outside world. It's not that the company is stupid - it's just that the

criteria are different. The outside consultant can help get other approaches adopted. He brings in the priorities of public opinion.

In a nutshell, this first period was marked by what I call a simple defensive strategy - which was absolutely logical, since we knew nothing. We picked up the slightest details. We were available, we disseminated information.

## *The first months*

After ten days of madness, we realized that we couldn't go on simply reacting, and that specific measures would have to be taken. Let me assure you that during the first ten days, while we were busy answering thousands of telephone calls from all over Europe, we didn't have a lot of free time to develop a new strategy. Nevertheless, bit by bit, it was beginning to take shape.

In the first instance, we intended to establish very close and direct contacts with the media as we began to receive somewhat more detailed information (even though the first technical report didn't become available until March 1985). This task was handled simultaneously in nine countries, from Athens to Barcelona and from Paris to Stockholm. It required us to make a substantial effort to improve our capacity for coordination. In addition to the media, we strengthened our contacts with co-workers in the company. Very quickly, we circulated a video from Warren Anderson, chairman of the group, to the 7200 Union Carbide employees in Europe.

Communication with the chemical industry was equally important. During the second week following the accident, we held a conference during an extraordinary meeting of the European chemical industry. We put all our cards on the table. (When I say "we," I always mean Union Carbide Europe and its CEO, Nathan L. Zutty, who led the European company at the time, and with whom we cooperated in a close and very fruitful way.)

The dialogue with the opponents went much better than I could have imagined at first. We spoke with church representatives and with ecologist groups. Our exchanges were always most profitable.

And then the company as a whole had to be managed. Because while more than 2000 people had been killed, the fact remained that the group still employed 100,000 people all over the world. This is why a crisis headquarters was created at Danbury, under the leadership of the chairman of the board of directors, that was to deal solely with Bhopal. The general management of the company was left to the man who is the current CEO.

Mr Zutty and I made a tour of Europe every two or three weeks. We visited the major capitals, disseminating the latest available information. On his part, this was what I call civic courage. A chemist, a CEO, he didn't know Europe. He had two options - either he trusted me or he didn't. He chose to trust me. We went everywhere, to talk with left-wing and right-wing journalists, without any filtration. In my opinion, that was the most positive

part of the information strategy: the CEO himself took time to go talk to everyone. He was there in person, not to defend himself or make excuses, but to explain what had happened and to guarantee that the company had decided to take moral responsibility for this catastrophe.

That was one of the first things I said to Warren Anderson at the first worldwide strategy session for the group (I was also a member of the general coordinating team in Danbury, which meant I was constantly coming and going between here and the United States): "Warren, you have got to tell the world that you take *moral responsibility."* Naturally, not everyone agreed on this point. Some raised legal considerations. During that meeting, we were pretty lost - what should we do, what should we say? I pointed out that we shouldn't become rigid, but rather should be ready to admit to our mistakes: "If you admit a mistake, people will not go on taking you apart." That brought about a gradual change in the group's strategy.

P.L.: So you had to work on the company's internal business culture.

P.-J. HARGUAY: Absolutely.

P.L.: So there were really two crises.

P.-J. HARGITAY: Exactly.

P.L.: As usual, I suppose there were forces in favor of openness and other forces fighting it.

P.-J. HARGITAY: One hundred percent right. Several times I ran the risk of being thrown out.

P.L.: As always.

P.-J. HARGITAY: Yes, that's a classic. But I was prepared to take risks, and as soon as I was convinced that the strategy being employed wasn't working, I said so, without pride, but with firmness.

P.L.: And the public debates?

P.-J. HARGITAY: There, too, I have vivid memories. Take this for example: The (Ecumenical Council of Churches had been highly critical, so I asked its president, a Mr Castro, for a meeting - always according to the same theory: talk with everybody, directly. They organized a meeting, with two hundred people, covering the spectrum from deep green to red: the Indian ambassador, radio stations - even a Dutch radio station (but I speak Dutch). At first, I wanted to present things in a very rational manner. That didn't last ten seconds. So I shifted: I started getting emotional like everyone else. That's exactly when all of them began to listen to me. I think people thought to themselves, "Wow, that guy's not a technocrat - he has feelings." I said that the first thing we had done in Geneva was to give $1 million to Sentinelles, a humanitarian organization with an irreproachable reputation, established by the founder of Terre des Hommes. But above all, I had a fairly sharp and personal exchange with a woman in the audience, apparently just back from Bhopal, who kept attacking me with images of suffering which, to her way of seeing, had left me unmoved. I remember very clearly - maybe it wasn't very fair on my part, but I was so tired of being attacked - I exploded: "Listen, madam, I was once a little child, who cried. Furthermore, I was born in a war, and I saw part of my family die at my side when I was

five years old. So don't tell me what suffering is. I already know." And I added, "I have a little child, a little boy whom I love, and everything I do is to help create a world my little boy can live in. So don't tell me I'm a horrible technocrat, because I'm not." Silence. Everyone was impressed, because it was a little volcanic. I could no longer stand these people trying to teach me what suffering was. I'm a Hungarian, I was in Hungary in 1956; my father spent years in Siberia...

I simply wanted to express this example to illustrate that we always tried to reach out to all sides of the opposition. We took the trouble to approach them, even if it was in southern Italy or northern Sweden. And it wasn't some underling who went: it was always the CEO and myself (at least at first - later I went alone, because I can assure you that I had become an expert on MIC!). It was always difficult, because we had to avoid all the pitfalls. For instance, we also had to fight on other occasions against unacceptable statements about the incompetence of Third World peoples.

That is an important lesson: In today's world, if you communicate like a technocrat, you're lost. If you become too emotional, you fall into an ideological discourse. You have to find the middle road between the two, which means simply being human. And what goes for external relations is just as true of the internal climate: a company that has no consideration for its employees will have a very hard time in a crisis.

One more observation: you are alone in such circumstances. But we immediately had remarkable contacts with Bayer, who promptly offered to cooperate closely with us.

## *Third phase: consolidating, rebuilding, and new crises*

The in-house communications and external information continued. We travelled everywhere strong criticism remained. We had to rebuild an image of Union Carbide that wasn't limited to Bhopal. Toward mid-1985, we began to think, "OK, the worst is behind us." That is when the accident in Institute, West Virginia took place - gas leaks at the Union Carbide plant there. Even though there were no victims, we couldn't have imagined a worse catastrophe. Confidence was shattered again.

P.L.: There was some delay in informing the plant's neighbors.

P.-J. HARGITAY: We were really knocked flat. All the good work we had done, day and night... I could have given up, on everything, starting with the people who still hadn't understood what information was. That was even worse than the first blow. And then there was the Temik business, over Union Carbide's leading insecticide. Someone in southern Italy had the nutty idea of accusing it of being the source of poisoning in tomatoes. Actually, that product couldn't be involved, since it is banned in Italy for all crops except sugar beets. We later received profusive excuses from all levels of the Italian Ministry of Food. Nonetheless, we had to deal seriously with this new

business - which had its focus neither in India nor in the United States, but in Italy.

The sad anniversary of the disaster arrived. There were no new crises. The media were grateful to us for having informed them honestly. We even got very positive articles appearing about Union Carbide. There is another lesson: adopt an open-door policy - but without being naive, naturally.

By then we had a solid background on the accident. We continued to inform our co-workers, the media, the industry. What's more, my conviction is that in such cases, we should develop our relations with our so-called adversaries, who present their serious concerns over the future of the western world. Even if there are differences of opinion, we have to take them seriously. And above all, we have to understand that communication is not always just a matter of technology and professionalism, but rather a question of culture.

This is where the real problem lies. We find ourselves in a situation in Europe where this culture is in its most fragile infancy. I can count the number of companies with a true communications culture on the fingers of one hand. This isn't a criticism, it's a fact. And it's quite understandable. We have had wars and fascist dictatorships that forced us to concentrate on rebuilding; then the cold war. It wasn't until the seventies, after the youth movement, that we could begin worrying about less immediate problems. The patriarchal culture has been called into question. People have started to think. Conventional managers found themselves - and still find themselves - with their toes in a crack, unable to reach outside their businesses.

P.L.: But don't you think that these strategic problems go deeper than just communication? Isn't there a more general problem of managers' ability to manage as the systems are becoming extraordinarily complex? Which means that in times of crisis, given the present state of organizations and of human beings, problems have very little chance of being handled well?

P.-J. HARGITAY: I agree with you one hundred percent. But I believe that we are not even doing the simple things we could do. For instance, increasing the prestige of weekend work, since that is when the major accidents take place. Of course I tend to bring things down to communication, because the stakes involved in communication fascinate me.

P.L.: What if Danbury had ordered you to fall in line with a communications policy founded on secrecy and on closing itself off?

P.-J. HARGITAY: I couldn't have done that. I would have dropped the job.

P.L.: If we leave Bhopal to one side, how do you see this problem of crisis management over the long run?

P.-J. HARGITAY: There is at least one frightening scenario. A private system, integrated to a degree as yet unimaginable, or a very strong political group, would take over the full range of activities, including communications. In either of these cases, there certainly wouldn't be any more problems with crisis communications. For my part, I believe in

democratic values and in communication. So I would like to finish with these words of Voltaire to one of his critics: "I don't share your point of view. I am even completely opposed to it. But as a democrat, I would give my life so that you might express your opinion with complete freedom."

EDGAR FASEL

# Schweizerhalle and the polluting of the Rhine

November 1-3, 1986

**Background**

During the night of November 1, 1986, a fire broke out in one of the Sandoz warehouses in Schweizerhalle, Switzerland, not far from Basel. The warehouse contained 1351 tons of chemical products, mostly intended for agricultural use. Firefighters brought the blaze under control in the early hours of the morning. The alert warning the local population to stay at home and close all windows was called off at around 7:00 a.m. The incident was over. But a few days later, the crisis broke out - the Rhine had been hit. At least some of the water used to extinguish the fire had drained into the river. Laden with toxins, it struck a European lifeline and supreme symbol, all the way to its mouth. The "death" of the Rhine made the headlines of all the European and international media. The event took place six months after Chernobyl. Once again, the public was unanimously shocked and outraged against the company involved, and many, including government officials, agreed that Sandoz had failed to demonstrate exceptional communications skills. The issue of deceit added fuel to the fire. Edgar Fasel was a recent arrival at Sandoz, with the job of creating a new external relations department that was to become operational in early 1987. He found himself in charge of information by mid-November, when the crisis was already solidly entrenched.

P.L.: This event had such an impact in Europe and the world over, following the Chernobyl trauma, that I'd like to begin with your fundamental impression on the crisis.

E. FASEL: So many untruths have been said about this catastrophe, which has already cost us 100 million Swiss Francs (and that won't be all) and which happened just after Sandoz had celebrated its centennial. It would be easy to attack a small minority of journalists who consistently pointed up the worst aspects. But it's important first to look coolly at our reaction. We were quite simply overrun and overwhelmed by events. To be brief, and therefore to simplify terribly, I would say overall that during the two weeks following the fire, we cut a sorry figure in the area of information and public relations. If our firefighters had been prepared for such a crisis the way our information

services were, we wouldn't have had just one warehouse or the Schweizerhalle industrial zone in flames - the whole city of Basel would have gone up in smoke.

Paradoxically, most of the mistakes had been made before November 1. We had let 100 years go by without taking the work of informing seriously. It should come as no surprise that two weeks are not enough to catch up.

P.L.: You were an observer of the accident before becoming a key actor in the crisis. What were the important steps you noted in the period in which the conditions for the crisis were being created?

E. FASEL: I was on the banks of Lake Geneva, back from a stay in the United States, and I hadn't yet taken up my functions at the head office. I was alerted Saturday morning by friends. I immediately called Basel, then Schweizerhalle, and made sure that the director of public relations and the press relations manager were on site. But I asked that they not be disturbed: "Let them work." I returned home to Basel Sunday, after seeing the reports on television. It was all over. I regretted slightly not having been present - it's always important to live through the major moments in an organization's life.

Monday morning, at the head office, everyone felt reassured: the firemen had done very good work, there were no victims - all that remained was to clean up the site. At the government's press conference on Monday, November 3 and at the Sandoz conference on Tuesday, everyone spoke of the accident in the past tense. We established the first estimates of the damages caused by the fire. Everyone was ready to close the case, as soon as the insurance had paid up. We were even relieved to see that the press conferences, which were grueling affairs (150 to 200 journalists, several TV crews), had gone so well.

The tone changed on Wednesday, November 5 - we began to perceive the two key elements that were to make Schweizerhalle into a historic event: first, the fear that had paralyzed the inhabitants of Basel during the accident, and, in the days that followed, the pollution of the Rhine.

Time passed, the gap grew wider. We didn't realize just what an enormous problem the dead eels were becoming. We were locked into the idea that the case was closed... We also failed to understand the fear that had marked the city's inhabitants so deeply - being awoken in the night; the awful smell over a part of the city, the children told not to go to school, then to go (following a misunderstanding between the Minister of Education and the civil servant in charge); sirens sounding that had been silent since the war (and which in fact worked unevenly; because they were growing old, the authorities had begun to remove them in order to replace them... and the new ones weren't yet installed, so that half the sirens didn't work). As with any accident, this fear emerged as a delayed reaction. Things overflowed a few days later, when we were absent from the communication arena - we were contenting ourselves with answering questions, insufficiently and with difficulty. But while we were absent, others were stirring up public opinion.

And the affair burgeoned: there were demonstrations, the convening of the cantonal parliament, a minute of silence at the Basel Grand Council, a meeting of both chambers at the federal level (something unheard of: that usually happens once per term, to elect the government). So there has been a collective trauma that will take years to heal. The entire relationship between the Basel population and its chemical industry has been upset. In that, we lost a precious asset.

Two points in this first phase deserve reflection:

1. There was an absence of initiatives in the information field. All we did was to react. Two interviews given by our president, Mr Moret, to the regional newspaper *Basler Zeitung* and to *Blick* (a high-circulation Zurich daily) were not enough to bring the situation under control. And since he had to preside over the crisis unit while continuing to fulfill his duties as director of the group, he couldn't do any more. In fact, he explained this in his press conference on November 21, 1986.

2. The list of products involved in the accident created problems. During a discussion with journalists early on the morning of November 1, while we were still in the heat of the action, indications were given as to the products involved. The journalists were impressed to receive this data so quickly ... But we neglected to tell them that this list was by definition incomplete and that it would have to be completed - and no journalist raised the question. A second list was given on Tuesday during the press conference. The reaction was, "So on the first day you didn't tell us everything." At the same time, our specialists realized that the second list was also probably not exhaustive. This isn't surprising, since only half the stock was in the computer, and we weren't sure we had all the paper registers... What a mess! In the end, they did a site balance sheet: what had gone in. what was left, assuming that the rest had burned. The theory seems attractive, but becomes less so when you know how big the warehouse is: a village of some 30 buildings, including one with 15 stories... They looked into each bag, each barrel... On this basis, a third list, probably much inflated, was published on November 21.

P.L.: Now we've reached the turning point of mid-November - you took charge of communication for the group, when tremendous ground had already been lost.

E. FASEL: On Friday the 14th, I realized that nothing was going right anymore in communication. I opened up to the CEO about it: "We're doing completely stupid work; everyone is after everyone else; we're all at the end of our rope; we're aggressive, bad losers, bad players..." He told me, "Yes, you're right, something's got to be done." He called a management meeting for Sunday afternoon. For my part, I brought together a team of some 20 people and got some new blood into the situation. On the 21st, we called together the international press. What was essential to my eyes was not the third list that we were going to give them, but the fact that the president would be there and would preside over the encounter. In fact, it went very well - Mr Moret was remarkable. For our part, we especially emphasized

that we had always told what we knew. People could accuse us of not knowing everything all the time, but they couldn't call us liars.

P.L.: On that basis, you had to rebuild from scratch.

E. FA S EL: The personnel and equipment infrastructure at Basel responsible for information and outside relations at the time of the fire was very weak. We created a telephone service to respond to the press: a team of eight, then twelve men and women. The rules were: don't leave any question unanswered, don't constantly disturb the specialists, who have to get their work done, make them come only for press conferences, don't systematically send every technical question to them (they are not communicators, that isn't what they are trained for). This service, which operated 24 hours a day, received some 200 calls per day during 30 days and dealt with 130 requests for individual interviews and with the presence of 17 television crews. The Japanese were interested in the problem, and of course the Americans never hesitate to put in a showing.

But our lovely organization came too late. The problems kept building: around November 20, a Zurich ecological institute announced that theoretically, "dioxin could have been released by the flames." The information spread like wildfire. When the experts gave their opinion - then-results were negative - the media were no longer interested in the subject. That episode really killed us.

In short, we could behave as properly, as skillfully as we wanted... the picture remained unchanged. The information professionals had decided we were liars, that we understood nothing, that we did just anything, that we were the lowest of the low... The population of the area needed to express that they'd had it up to here with technology: Chernobyl, Challenger, local discussions on nuclear energy, and now "just anything" from the city's chemical industry... There was no real way to correct the situation.

All we could do was pull our heads in and wait until people were ready to listen to us and believe us again. We made use of that wait to refine our organization and prepare our messages.

Basically, in terms of information, we were setting out to make up for lost time. Because Sandoz had gone through its first century successfully, of course, but without a true communications culture.

P.L.: From this experience, what other lessons did you retain, especially about the immediate reaction to the crisis?

E. FASEL: The following, in particular:

1. *Foresee a crisis organization for the information department.* No business can equip itself on a permanent basis with a sufficient number of information professionals to handle a large-scale crisis. Therefore, you need a crisis plan. This should include lists of tasks to be performed and should set priorities. In quantitative terms, this crisis organization should provide for the rapid expansion of staff by co-workers "borrowed" from other departments. These auxiliaries should have been designated and informed about their tasks beforehand and should go through periodic training.

*2. Create an open setting.* The company should say what it knows as quickly as possible. Don't wait to announce the bad news: in fact, the sooner you touch bottom, the less painful the process will be. Then you can always redistribute hope, instead of having to go on blackening the picture, which slowly deadens the capacity to react. Other rules: say everything you know, say only what you know, but be sure to specify, "We don't know everything - be ready to receive other information." Outline possible ways the situation may evolve, and their probability. One thing is certain: the stage is set in the first hours, the first 48 hours. This is the stage on which the coming weeks and months will be played out - it will be almost impossible to modify. Having the president appear and participate is important in creating this open setting.

*3. Beyond the press, don't forget to inform other publics.* At Schweizerhalle, the physical and psychological pressures created by the hordes of journalists on our departments made us tend to forget other groups who were nonetheless essential in such circumstances: our personnel, the subsidiaries, shareholders, our colleagues, authorities not directly involved, certain categories of consumers and prescribers, and so on. The worst is no doubt that we completely neglected our employees - they had to watch television, read the newspapers to know what was going on here, "in our company, in-house," as they say. It is therefore imperative that the crisis organization ensure full service to all these target publics, independently of the actual press service, but coordinating with it.

4. *Take care of representatives' physical condition.* In a crisis, you have to tell people firmly that they are doing no favor to their company if they stay 24 hours a day at the office for five days. Of course some resist better than others, but everyone breaks down eventually.

5. *Be ready to face solitude.* And worse - no one hesitates to tell you that they take you for liars - they tell you so bluntly. And soon, you'd even be happy if someone came and patted you on the back, saying, "You're a good guy; you've had some tough luck; you ain't too sharp; you ain't too bright; you're doing a lousy job... But you sure are nice, and I really appreciate the effort!" You would like to hear an sympathetic word from the public authorities: "You will have to answer for your mistakes before the courts, but you should know that we are behind you, we count on you, because you are the only ones who can bring us through this mess - if we can help you, just say so; you can count on us..." But that isn't the way the script is written.

P.L.: Fundamentally, what do you think today?

E. FASEL: Here again, I'd offer a few points around one key idea: the company has to be open to its environment, exchanges must be opened up with all the players.

1. *Develop a "cybernetic perception" of public relations.* This means not only getting messages from the company to the public, but also getting the organization to take into account expectations from the outside. Just as a banker won't allow any old decision to be made, the job of public relations is

to indicate what won't be acceptable to the outside. This must go hand in hand with the appropriate status of external relations within the company. To succeed, companies have a duty to think in "peacetime" about their culture, their communications ethic, and their choice of communicators.

*2. Break out of the fortress mentality.* This new perspective is doubtless not easy to explain to a generation of leaders (imagine suggesting to your president that he meet with activists because they want him "to account for his actions"... the earth would tremble!). But if your culture doesn't evolve in this direction, I don't see how you can hope to develop social consensus, which is vital in a company, and even more so for handling a crisis: if a leader tackles a crisis primarily as the head of a fortress, he is lost.

3. *Develop partnerships that forget the caste spirit.* On the outside as well, you notice a fortress mentality (the press is very similar to industry in this). So you have to bring these issues out of the company and develop networks for thinking and exchanging ideas, breaking down barriers.

4. *Seek maturity, work for the long-term.* It's important to avoid false solutions like promptly condemning the chemical industry (it's hard to see how we'd get along without it). On this point, in a crisis, everyone should know how to avoid inflammatory declarations (especially electorally-oriented statements). After all, there is a risk that one day, an industry leader will declare, "Frankly, it's too dangerous - I'm getting out." We can't all work in banks or academia! But there are real questions to be asked. For example, there are very few accidents (significant progress has been made in the safety field), but when they occur, they are very serious. We have to knuckle down, knowing that the ground is constantly shifting. The conclusions we draw today would have seemed completely outrageous and unacceptable just five years ago: people would have said we were alarmists! The experience of recent years has served, not so much to wipe out old-fashioned ideas, but to show that some conventional ideas were no longer entirely satisfactory. This is an opening, and we have to make the best use of it.

PHILIPPE VESSERON

# The case of the Seveso waste drums

1982-1983

## Background

The case of the forty-one drums of waste from Seveso, Italy - which were "mislaid" in October 1982, frantically searched for by all of Europe from March 25 to May 19, 1983, only to be found in the rear courtyard of a butchery and solemnly transported to Basel, where they were destroyed without further incident - was a media event of exceptional proportions for Europe. It held newspaper headlines for almost two solid months (outlasting other events that included serious floods and a mass expulsion of Soviet "diplomats"). The danger was neither grave nor even present -yet the crisis was acute, and full of lessons.

Before looking at the direct experience of one of the primary actors from the French public authorities' camp, who was an advisor to the two Ministers of the Environment handling the case (Michel Crépeau and then Huguette Bouchardeau), it will be easier to read that account if we first present in some depth a few landmarks in the crisis and how it unfolded.

This crisis exploded on March 25, 1983 with the announcement in the French daily *Libération,* and the publication in the popular science magazine *Science et Vie,* of a bombshell article entitled, "Is Seveso's Waste in France?" More than forty organizations and businesses, half a dozen countries, and countless scathing questions were suddenly thrust into the limelight.

This was amazingly fertile terrain for developing a crisis: as background, the accident at Seveso, in the suburbs of Milan, and the murky world of industrial waste; that fail-proof trigger word, dioxin; a mad treasure hunt for the forty-one drums, full of snappy plot twists; the implication of multi-nationals enmeshed in the dark deals with shadowy sub-contractors accustomed to working in the greatest obscurity; Italian authorities hiding behind national interest while hosting tumultuous press conferences; a delectable customs scandal; an unmarked truck crossing the Franco-Italian border - after Senator Luigi Noè, the Italian regional official responsible for cleaning up the aftermath of Seveso, had conscientiously accompanied it there and posed at the borderline for a picture with the convoy, to prove he had done his duty. To add a zest of provocation, the key request made by the parent company Hoffmann-La Roche had been to exclude Switzerland (and Italy) from the truck's possible destinations. Actors and spectators felt their impotence in an extraordinarily complex world that suddenly seemed unmanageable (with hundreds of places where the drums could be, and hundreds of suspects) - or willfully manipulated by forces that were as powerful as they were invisible. The whole business was unveiled by a journalist allied with Greenpeace for the occasion and playing a modern-day David facing down Goliath, a James Bond delving into the secrets of the powers that be, or a Sherlock Holmes tracking down this lost cargo.

How did things reach such a state?

Following the accident that occurred on July 10, 1976 in the plant of ICMESA (the Italian subsidiary of the Swiss pharmaceutical group Givaudan-Hoffmann-La Roche[1]), the Swiss firm and the Italian authorities had to deal with disposing of the materials most severely contaminated by the dioxin released in the chemical reaction caused by the accident. Several approaches had been considered, then dropped.

In the Spring of 1982, they called in the Mannesmann Italiana company. Intense negotiations were necessary, especially because of the contradiction between the discretion required by Mannesmann and the client's premonitory desire not to act completely blindly. Finally, all parties agreed (in a July 20, 1982 letter from ICMESA) to a proposal from Mannesmann: the waste would be eliminated in a dump in a European country, with the exception of Switzerland and Italy and in accordance with applicable regulations; a notary would certify the conformity with the required authorizations after the fact; should legal proceedings be engaged, the originals of the various documents would be handed over to ICMESA, which would only reveal them to court authorities. The waste was placed in leakproof drums of the type used for nuclear waste. On September 10, 1982, they crossed the border into France near Nice.

But of course none of this was known when the article appeared in March 1983. How did this matter become public? In several steps, and through several channels. Everything started on October 1, at a meeting of the Scientific Committee of the London Dumping Convention, an international organization regulating toxic waste disposal at sea. The Italian delegation presented a project for sinking the dioxin-contaminated materials removed from inside the Seveso plant. No doubt this project had been abandoned several months earlier, but no one had thought to inform that administration.

Shuddering at the thought, representatives of the ecologist organization Greenpeace at the meeting as observers publicly denounced the idea. The press didn't pay any great heed - it was more interested in the upcoming trial that was to determine responsibility for the 1976 accident.

On October 14 came the surprise: Giuseppe Guzzetti, president of the Lombardy regional council, refuted Greenpeace's allegations about a sea dump by declaring that the Seveso waste had been "transported by road to a foreign country and buried in a non-nuclear toxic waste dump in clay soil." On October 16, he admitted not knowing the convoy's final destination: "Only the Givaudan company knows." The Italian daily *La Stampa* specified that the truck had crossed the border through Ventimiglia and Menton on September 10 at 1:00 pm GMT. According to that source, it had quickly crossed France to reach West Germany. The *Corriere della Sera* hinted that the final destination had been East Germany. On October 19, the president of the regional council and Senator Luigi Noè, head of the special Seveso bureau, held a press conference in Seveso and confirmed that "Givaudan had given them written assurances that the operation and the dumping of the waste in an official storage area for non-nuclear toxic waste had been performed under perfect safety conditions."

Givaudan also took the stage on October 19. It did not know the final destination, but the waste had been placed in forty-two double-walled drums, which were not in Italy, or in Switzerland, or in the ocean. With the approbation of the Italian authorities, a transportation contract had been signed with a company that had assumed responsibility not only for shipping the waste, but also for disposing of it. The final dump had been made in accordance with all the applicable safety regulations of the country in question.

The press was still very discreet about the issue.

This game of hot-potato picked up pace on October 20, when the Italian authorities stated that they did not know who the transporter was, and repeated, "Only Givaudan knows." Greenpeace kept up the pressure on the 21st: "No indication has been given that the material

1. See P. Lagadec, *Major Technological Hazard*, Oxford, Pergamon Press, 1982.

ever left French territory. We wonder whether the waste hasn't been buried in France" (the French press agency AFP did not include this point from the Greenpeace communiqué in its dispatch). In Italy, the guessing game was going full tilt - West Germany? East Germany? France? But the French press remained muted - with one exception. On October 26, an article in a newspaper for French medical practitioners prefigured what was to appear in *Science et Vie* five months later. The scene was already set, even though some pieces of the puzzle were still to be found by *Science et Vie:* the investigative difficulties, rumors, mysteries, and countless players all rushing to pass the problem to someone else, as if it were a live grenade. It was a real detective story, making every reader feel like Sherlock Holmes. And yet the reaction didn't gel in France. Nor did it gel after the French-language broadcast on Swiss television in February 1983, which retraced the cargo's wanderings after coming into France. The press in that country had virtually abandoned the topic by the end of the year. Only the *Canard Enchaîné,* a French *National Lampoon,* concluded a fairly moderate article on January 5, 1983, with a wry punch: "Somewhere in Europe, there are folks who risk having a very serious surprise one day."

The surprise actually came three months later with *Science et Vie's* publication of an article by science writer Jacqueline Denis-Lempereur. The media coup was assured by another article published simultaneously in *Libération* and a carefully-worded press release that spoke to readers' stupefaction and unformulated fears of an intangible threat actively at work somewhere. This text, which was reproduced throughout the press, traced an outline for the reaction: France was faced with a grave and secret danger that was hard to pinpoint. The only possible response was to raise a general hue and cry, as the state had revealed how quickly it could be cut out of the circuit by networks of powerful and intangible players determined to operate incognito. For the first time, the name of Bernard Paringaux, the French sub-contractor whom Mannesmann Italiana had entrusted with the business, appeared in print. The article's conclusion was to the point: "Someone has to make a clear, documented statement about where those forty-one drums are (...). Otherwise, the possibility cannot be dismissed that dioxin has been camouflaged in France..." This time, the story had such an impact that Jacqueline Denis-Lempereur herself was surprised.

This was more than just an incredible saga - the stakes were actually very high. Government, administration, and especially the chemical industry were becoming subject to widespread suspicion. In fact, a boycott of La Roche products was undertaken when the company announced that it had no further knowledge about the matter. One after another, industrial waste dumps were targeted for investigation. People began to see suspicious drums everywhere, and though the verifications were always negative, they turned up other unsavory situations. These second fronts (such as the Roumazières dump in France, which became a particularly inflammatory obsession) could at any moment have become main theaters of operation. Some Swiss industrialists estimated roughly that in two months, Basel's chemical industry had eroded ten years of public relations capital. The effect was disastrous, tarnishing the image Hoffmann-La-Roche had worked so hard to restore after the July 10, 1976 accident, just as the trial of that case was opening.

In France, leadership was taken by the Ministry of the Environment, which had been following the matter since October 1982. How was this agency hit by the crisis? The bombshell article appeared on Friday morning, March 25. The Prime Minister had resigned two days before. On Thursday evening, Huguette Bouchardeau had joined the government as Minister of the Environment. One item, a communiqué published by the minister's offices, stood out from all the other press dispatches on March 25, and AFP was quick to personalize it: "On this subject, Secretary of State for the Environment Huguette Bouchardeau's offices published her first communiqué since assuming her duties on Friday (...) confirming that the materials had been 'sent outside France before being eliminated'." The impact was immediate. Agence Centrale de Presse headed its dispatch, "Minister of the Environment declares, 'The materials have been sent outside France.' Greenpeace asks for proof of the convoy's final destination." This was a goldmine for the media machine - at last, the press

had at least one actor who offered specific though incomplete assurances. This was better than a scoop - it was a lead!

Nor did statements by Hoffmann-La-Roche that same day help to calm the frenzy. The company knew nothing about the destination of the waste, a problem that had never been its responsibility. Furthermore, its ignorance and silence had been required before a notary (AFP, 6:18 pm). The press agency put the screws on: "More than happy to get rid of the waste, and pressed to do so by Italian authorities, Hoffmann-La-Roche apparently accepted the conditions offered by the shipper, who has since respected these orders [to remain silent]."

That Friday provided enough ingredients to make the *Science et Vie* article into more than just an informative feature. The whole system was so entangled in uncertain and unacceptable elements that the article became the trigger for a process that would readily degenerate into crisis.

This crisis paralyzed several European countries, especially West Germany, for a matter of weeks, i.e. at least until the drums were discovered on Thursday, May 19, in the northeastern French village of Anguilcourt-le-Sart, where Paringaux had simply hidden them the previous Fall.

That long-awaited moment created the occasion for one last slip-up. In a dispatch with dateline Bonn (4:34 pm), AFP announced that "the Thursday edition" of the German newspaper *Die Welt* held the key to the riddle (but *Die Welt* is an evening newspaper printed with the next day's date, and it took an additional period of confusion before everyone realized AFP meant the Friday edition). The forty-one drums were in Anguilcourt "in a courtyard belonging to a former municipal slaughterhouse, located to the left of the war memorial, across from the school. The site is protected by a simple rusty gate, easily opened." Was the matter serious? (Numerous false leads had already appeared.) The declaration was very detailed, and somewhat provocative. (The Germans had not really appreciated being asked by the French minister to investigate the German company to whom Paringaux claimed to have transferred the drums.) The West German Minister of the Interior immediately took a position, declaring that "these indications should be taken seriously, and he was certain that the French authorities would undertake all steps necessary to verify this information."

The statement from prosecutor's office announcing that the drums had been found was only issued an hour later. After weeks in jail, Bernard Paringaux had finally told the committing magistrate where the drums were stored. Questions on this mysterious denouement came hard and fast: How did *Die Welt* get the information? Before Paringaux officially broke his silence, who knew? *Die Welt* kept up the attack on May 20: "Since the beginning of the week, the French government had serious leads indicating that the drums were in Anguilcourt, and it did nothing. At the same time, other officials, also in the know, were afraid up to the last minute that to avoid a scandal, the French government would secretly transport the drums to a military base before shipping them to Switzerland." These "other officials" were afraid of a "negotiated solution" that would have resulted in the government's discreetly recovering the drums. This solution failed, explained the regional newspaper *Voix du Nord* on May 21, "because of leaks" apparently intended to counteract such a discreet arrangement. Other regional papers took up arms against the "official story" of Paringaux's confession.

In any case, the drums were quickly transported, in the presence of the press, to a military base. From there, they were convoyed by Hoffmann-La-Roche to Switzerland on June 4. They were incinerated in Basel in 1985, amid general indifference.

With this background in place, we can now examine the case with Philippe Vesseron.

P.L.: How were you plunged into this strange case, which smoldered before exploding brutally with the *Science et Vie* article?

PH. VESSERON: Strangely enough, the matter began by a very serene period. This covered the events of October 1982 - the limited fuss about the meeting of the London Dumping Convention, the declarations by the president of the regional council of Lombardy on the subject: "The residue from the decontamination of Seveso has been taken by road to a dump, in a country whose name I will not tell you." The whole thing appeared in French and foreign press agency dispatches without raising any of the questions that common sense should have dictated in such shadowy circumstances.

The Ministry of the Environment undertook to clarify the mystery before anyone asked him to. On Friday, October 15, the Ministry (Jean-Rémi Gouze, the deputy chief of the industrial environment department) called Hoffmann-La-Roche in Basel. Late on a Friday afternoon, it takes time to get ahold of someone, but it can be done, with a little tenacity. From the guard, he was switched over to the official who was on call at home, then finally got the spokesperson. The following Monday, I was to call Hoffmann-La-Roche and request written confirmation of the answers we'd been given.

Also on the 18th, Jean-Rémi Gouze asked the general direction of customs if there was any trace of this shipment arriving in France. A laconic telex with a negative answer came the next day.

On October 21, Hoffmann-La-Roche sent me a long telex giving extensive details on how the residue was packed and on the dump to which it had been sent: " in a deep trench dug in a clayey area," "covered with a three-to-five-meter-thick layer of clay," "the area in question is characterized by exceptional seismic stability." La Roche affirmed that the appropriate authorizations had been scrupulously obtained and obeyed, and concluded that the dump was not located in France. It was not, however, more explicit about where the dump might actually be.

In late October, the ministry nevertheless pursued its investigation by having the Italian authorities questioned by the French embassy, by asking our regional offices to check whether anyone had requested this type of authorization, and by simultaneously putting the same question to operators of companies running industrial waste dumps. With uniformly negative results.

Of course, nobody imagined that the customs agents would have been sure to spot the passage of a truck that didn't represent any noticeable characteristics according to their criteria. On the other hand, when a company like Hoffmann-La-Roche details such precise facts in writing, you have the impression that you've got something solid.

These efforts led us to believe that we had reacted properly, even if no one was asking us the questions we wanted to be ready for. The only interrogation at the Assemblée Nationale was regarding the old project to make a sea dump. However, our offices had undertaken an open investigation, found contacts - even outside the established network, and had obtained what seemed to be trustworthy answers. All that made us feel satisfied. That Hoffmann-La-Roche provided us with the most detailed response fit in with

the idea that each industrial leader had to be able to account personally for the conditions in which waste from his plants is eliminated. In short, we were almost sorry that no one else was wondering about it.

The investigation went on for a month and a half with hardly any new elements. Looking back after the fact, I notice that already on November 5, Senator Luigi Noè, who was in charge of the special Seveso office, had declared to our embassy that the truck we were looking for had, "after a stop in Marseille, arrived in northern France, in Saint Quentin [near Anguilcourt-le-Sart], where the shipment had been stored several days, awaiting the authorizations from the country of final destination." But at the time, we read this passage in the light of the telex La Roche had sent to us on October 21. Nobody was very interested in Marseille or Saint Quentin.

In fact, this was a period in which the matter was dissipated in the wheels of the administrative works: because of the way our Direction for Pollution Prevention is structured, the question simultaneously concerned the units involved with water dumps, with waste, toxic issues, and chemical manufacturers. When a topic is in the news, everybody gets into the act, and we often see friendly competition develop (administrations have innovative capacities that really don't match their typical image). Though it can also veer into feudal warfare. By the same token, as soon as an issue is no longer urgent and doesn't precisely fit anyone's job description, the information may very well not be used fast enough.

In any case, Marseille and Saint Quentin came into the foreground of our preoccupations on December 10, 1982. That day, Customs called Jean-Rémi Gouze about a Bernard Paringaux who lived in Marseille and operated a dump in Saint Quentin. A two-pronged action was then launched by Customs in Marseille and by Jean-Rémi Gouze in Saint Quentin. I never did know for sure how the name of Mannesmann's sub-contractor first emerged in this murky business - a Customs informant in Rome, so it was said.

At Environment, the emergence of Bernard Paringaux's name was a big surprise. Of course we'd known for some time that he had played an intermediary role in several touchy waste disposal cases, but nobody expected to find him in a matter that Hoffmann-La-Roche had wanted to handle like a high-tech affair. It was a little like finding out that the main plumbing in a nuclear reactor was made with old pipes from the local junk yard.

But alas, when the dump at Saint Quentin was checked, the Seveso drums weren't there either, although we uncovered several other turpitudes. As for Paringaux, he refused to give any details. This is probably when Environment and Customs made their first big mistake. They should have taken legal steps, not just by phone but in writing, and without limiting themselves to the formal violations. Too often, administrative bodies forget that when their anticipatory measures have failed, it's up to the law to decide what should be done. It would seem obvious that you don't make a rule without thinking about what will happen if someone breaks it. In law enforcement, it is the courts, first and foremost, who handle cases of

violations. In this business, the courts were only brought to the forefront after those tumultuous articles had appeared. They remained somewhat bitter about having been poorly informed from the start. Nothing is harder than rebuilding confidence when cooperation didn't exist before the crisis.

In fact, in December 1982, the discovery of reprehensible activities in Saint Quentin did not sway the earlier analysis: we knew that Paringaux frequently acted as a broker in shipping waste to the big dumps in the north of both Germanies. If the drums weren't in Saint Quentin, that is where they must have gone, we were rather quick to think.

At the end of December, Senator Noè asked to see me. I received him one morning just before Christmas, with the Director of Pollution Prevention. The senator gave us a copy of an affidavit drawn up on December 13 by a Milan notary, certifying that everything had gone as planned. What surprised us was that the language was almost identical to that used by Hoffmann-La-Roche in October (e.g. "under a layer of clay at least five meters deep").

That was when we began to ask the troubling question of who really knew what. It was becoming apparent that several actors had simply given out secondhand information as firsthand affirmations. Was the whole thing founded on anything besides a "certificate" drawn up by Paringaux? We had to go back to our original contacts and ask the same questions again. So we addressed a telex to Hoffmann-La-Roche on February 1: "I must confirm the serious doubts I expressed to you about the credibility to be accorded to certain companies to whom this operation was entrusted. Under these conditions, I can only reiterate my hope that your group will proceed urgently with a very detailed evaluation of the conditions in which this waste was eliminated. You are no doubt aware that this matter could have serious consequences for the entire chemical industry in both our countries, if rumors began to spread concerning the secretive conditions of the elimination. This would be all the more serious if the operation had not been performed in conformity with the applicable regulations, as you indicated it was. In such a case, your group would have to show extreme diligence in taking the necessary corrective measures."

The answer came back on March 22. The group confirmed its assurances made in October. But the tone had changed: from resolute affirmations, they had shifted to the idea that there was no reason to doubt the assurances that had been given by partners like Mannesmann, and that Hoffmann was somewhat powerless with regard to them in any case.

In the media, practically everything had been said since October. I was informed that journalists were questioning the minister's offices in Paris and in the provinces. There was nothing to hide.

That's where things stood when *Science et Vie* published its article on March 25. The day before, in the midst of a cabinet reshuffle, I had been interviewed about the drums by a journalist from *Libération.* She quoted me without fanfare: "The hypothesis that they are in France cannot be excluded." This was preferable to getting tangled up in statements like, "I don't know

where they are, but I am firmly convinced they are no longer in France", even if that was what I believed, like everyone else at the time.

The radio got ahold of the business the next morning. The prime minister's office asked me to review the case quickly with Environment's new minister, who was getting ready to assume her functions and who would be invited for the televised midday news shows. And was Huguette Bouchardeau interviewed about the arrival of a woman in the government, from an extreme left-wing party, who had been a much-discussed candidate for president to boot? No. On the whole, all the questions dealt with the drums from Seveso. And for almost two months, that business filled two thirds of her time.

While the minister was in the television studios, something appeared that was to create one of the embarrassing snafus: a press release from the direction for pollution prevention, issued in an attempt to clarify the situation. Among other things, it specified that "the drums have been shipped outside of France" - the reflex to reassure! Naturally, since the statement hit home, it was immediately picked up word for word by the press agencies - and attributed to the minister! What could the minister do? Deny it? Confirm it? Say nothing?

P.L.: This is when the crisis really begins. The minister finds she has been attributed with a very cumbersome declaration. Should she accept the burden, or throw it off at the risk of increasing the turbulence?

PH. VESSERON: We realized that right away. Mrs Bouchardeau made her choice quickly: say what had been proven, without waffling. Actually, brutally denying the first communiqué that had been attributed to her would have been a particularly touchy move. It would have been messy. The remaining option was the style, "I have been wrongly quoted as saying the drums have left France. I personally said nothing of the sort. In reality, I don't know where they are" - but she had to say so without looking like a turncoat.

P.L.: So what to do?

PH. VESSERON: Above all, not confirm that fuzzy message. Put it aside, as though it never existed, but say what we'd done. That wouldn't have been so difficult if the media hadn't begun by attributing the press release from our services to the minister. For two weeks, every time she made a statement, the journalists repeated that "Mrs Bouchardeau" had denied the presence of the drums in France", even though she spent her time reiterating that probably no one but Hoffmann-La-Roche and Paringaux knew where they were. In fact, the gap between an original, apocryphal but expressive declaration and what the minister was actually saying gave the impression that the government knew more than it was telling. This was a grave difficulty, even though our only possible goal was openness and rationality.

P.L.: This marks the end of the first phase: a long latent period, then a brutal eruption. What are your thoughts about this slow uptake?

PH. VESSERON: First, one observation: events that take such a convulsive turn often develop slowly. If you don't force yourself to record the facts, the information, the decisions made, very quickly you lose all means of re-evaluating the situation when the crisis becomes drawn out. You have to be able to go back to the real facts behind the interpretations that are made at any given moment. But nobody thinks spontaneously of establishing this verifiable chronology of events from the start. This story is really fundamentally simple, but it was characterized by its duration and the weight of rumor. So it proved very important, for example, to have requested that Hoffmann-La-Roche confirm its position in writing, and it was regrettable that the prosecutor in Saint Quentin was only informed orally in December.

Fundamentally, two mistakes were made:

- The first was to keep our original contact at Hoffmann-La-Roche, without wondering about his position within the company. Large corporations, like large bureaucracies, are by definition complex systems, with their own internal problems. Things would certainly have evolved differently is we had pushed for the implication of Hoffmann-La Roche's president as early as December 1982.

- The second mistake was to consider that the matter was public because it had been handled in press dispatches in October 1982. But since nobody had paid any attention, when the media crisis started, everyone acted as though the contents of these dispatches had been hidden as part of some clandestine plot that a valiant journalist had decided to fight. It is almost an insult to tell a journalist that he or she neglected to read the AFP dispatches five months earlier. It would have been in our best interests to draw attention to this publicized information from the start, in order to prevent the effects of these pseudo-revelations later on.

P.L.: Now we're entering into the second phase, marked by unrelenting media pressure. How did events develop from this point?

PH.VESSERON: A true soap opera went on for a month and a half. Very quickly, the committing judge jailed Paringaux, who maintained his silence. Some people were surprised that we couldn't force him to talk - were we supposed to put his feet in the fire? Numerous journalists set out to follow up the various leads available, convinced that they were going to discover dazzling truths or murky plots.

A sort of paranoia spread across all the countries of Europe. Hoffmann-La-Roche did try to demonstrate that the drums were solid enough to exclude any immediate danger, but nobody wanted to hear about it. Everyone was looking for those drums, every dump was called into question. There was talk of the secret services in the East and the West. No newspaper wanted to be left out, even when there was nothing new.

Oddly, everything happened as though the press were the main communications channel between Hoffmann-La-Roche, Mannesmann, and the other authorities at that point. This created a strange dialogue in which a French minister would be asked to comment on what had been said that morning by a German counterpart, without necessarily having any direct

indications on what had been said. The situation had become completely multi-polar, and a simple lag of a few hours could create an impression of a contradiction or a conflict, when often none existed.

At one point Mrs Bouchardeau queried her West German counterpart, leading the Germans and the Swiss to call the role of Mannesmarm into question. This suddenly generated a paranoia in the Federal Republic even more serious than anything we'd seen here. I remain persuaded today that pressure from both these governments on La Roche and on Mannesmann was the most effective tool for unravelling the mystery. Yet at the same time, the Germans' agitation drove us bit by bit to put these problems into perspective, beyond the daily plot twists: How were industrial risks in general, and not just dioxin, handled? What responsibilities did corporations have with regard to their sub-contractors? How much openness was necessary? Then there was the role of international borders in all that. Did they set the limits on a corporation's obligations? Should we all adopt a policy of tending our own gardens, as Germany was suggesting? What was the role of the European Economic Community? In such cases, it has proven more important to ask the right questions than to pretend you can pull ready-made answers or cut and dried regulations out of your sleeve.

What I retained above all from this period was the idea that any serious accident in a European country would eventually unfold in the same multi-centered way, where the statements of one authority could be confronted at any moment with a comment picked up in another capital. Of course European-level institutions could not remain silent either. As for the media, they also have their international touchstones. The tone of what is written by the press of one country certainly influences the editors outside its borders.

All this very soon led to an explosion in the number of contacts to be dealt with, who all shared more or less comparable information, but looked at it with their individual concerns or prejudices. The only way out was to be kind to each one, to be as available for the Italian senator as for the Swiss industry leader, the German bureaucrat, or the British television crew, whatever else was going on at the moment.

P.L.: Amidst all this stir, the conflicts, and the frenetic searching, what were the most difficult moments? The problems at the Roumazières dump?

PH.VESSERON: The Roumazières episode was simply a crisis within the crisis, which actually played a stabilizing role. That was another somber business, where Bernard Paringaux's name appeared again. In the clay quarry of a tilery in western France, a dump received waste from several chemical plants located in France and elsewhere. Some of this waste contained arsenic, dioxin - in short all the poisons worthy of the name. Was everything there in order? Could this disorder be hiding the drums all Europe was looking for? People practically made this case into the equivalent of the forty-one missing drums, and our success lay in showing clearly that we were regaining control of events. Without yielding to any wild ideas, we managed to bring the chemical groups who had used this dump to take a reasonable amount of

responsibility, whether they wanted to or not, and we re-established a solid consensus among all the parties involved, which still holds today, so I've been told. All this peripheral tension gave me a chance to use a little pedagogy and re focus people's ideas. But bringing all these players back into the act was hard work, especially for the prefect who was in charge of this area. He had a lot of good qualities, but nobody could envy his situation. I adopted the rule that he should be able to reach me anytime. In a crisis situation, when you don't necessarily make crucial decisions every day, you still don't want to leave the people on the front line with the impression that they're alone, or even worse, that they are being used as lightning rods.

No, much more than the Roumazières distraction, the hardest period for me was when I realized that there were serious conflicts regarding the drums within our administration. This is really nothing astonishing - it's classic to see divisions, and even parallel initiatives emerge within an organization in times of crisis. After all, if a crisis begins to sour, you have to be able to fall back on other people or other strategies. The problem is that these internal tensions can actually be causes of failure! What helped me at the time was having learned previously that the phenomenon is perfectly banal. If you've integrated this obvious idea into your personal attitude, it's almost amusing to watch the thing in action.

Otherwise, discovering this type of tension in the heat of the action could have highly destabilizing effects, especially as everyone spontaneously feels heavily implicated in a crisis, where you are constantly having to act on very different fronts. As a matter of fact, this is a pretty general risk: at the beginning of a crisis, you often assume that the crisis will be short-lived, and you act in consequence. Yet its potential duration and complexity require that you maintain a group organization that can incorporate new parameters and deal smoothly with unforeseen developments - as well as you can. One of the lessons I've retained from this media crisis was this contradiction between having to operate in the fast lane (things are tense, there's lots to do - which is more or less true -, everyone is pressing for action and information) and having to plan further ahead than the next day. If you forget that, if you're not ready for it, you can easily lose track of your primary goals along the way.

P.L.: Such as?

PH.VESSERON: Such as, in this business, somebody, I don't remember who, had the idea of secretly recovering the forty-one drums and destroying them incognito - in short, carrying out Mr. Paringaux's contract. We simply forgot that the question wasn't a technical problem, but a crisis of public opinion and the media. The very cause of these fears was uncertainty, secrecy, and the feeling that the law and the authorities had been flouted. In that sense, negotiating a secret solution with Paringaux could only aggravate these worries. The real task was to clarify, to publicize, and openly to regain control of events. Thank goodness, early in May, Mrs Bouchardeau for one, and the committing judge for another, both put an end to that whimsy by explaining in a few words how inappropriate such an idea was. Of course you

might think that since it was essentially a media crisis, a few words to the press were all it took to put a stop to such false solutions. In any case, I am persuaded that when a crisis becomes drawn out, it is vital periodically to put the machine back on track.

P.L.: Wasn't the actual discovery of the drums particularly difficult?

PH.VESSERON: My memory of it is curiously mixed. Events moved very fast, producing new complications, and yet it was immediately apparent that things were becoming stabilized. It seemed as if the whims of fate no longer had any impact.

This restabilization came from the success of the committing judge's efforts to persuade Paringaux to reveal where he had hidden the drums; from Hoffmann-La Roche's proving that it was determined to face up to its responsibilities; and from the general realization that there was no danger. Everything became clear and open again. Everyone returned to his or her real role. From then on, until the dioxin was destroyed in Basel, everything unfolded in an exemplary way.

There were new tensions. A surprising delay meant the courts announced the event long after the press agencies did. A long meeting was held in the prime minister's offices to organize the follow-up, while the journalists were lying in wait to record a statement from Mrs Bouchardeau. Of course it's perfectly logical to spend two hours in a meeting to make decisions calmly. But if those two hours end up creating problems for a minister who has to offer explanations to the press, that's something else. It would be deleterious for state decisions to be motivated solely by its communication needs, but you need to be modest enough to realize that even for important decisions, the media can't stop the clock. The nightly news airs at 8:00 p.m., even on the day you find the Seveso waste drums.

P.L.: And on-site, at Anguilcourt-le-Sart?

PH. VESSERON: A tiny village in the north of France, invaded by a crowd. A poor little family watching, somewhat stunned, as the authorities, the army, and a dozen television crews bustle around their home without worrying about anything but those drums!

I had been sent there, accompanied by Hoffmann-La Roche's general director, mainly to show that things were happening in a calm and rational manner.

I've worked for years in the prevention of technological risk, and I've been witness to many accidents and some worrying situations. But there, the technology was contaminated materials contained in plastic, then placed in a security drum surrounded with light expanded clay aggregate and set inside a second security drum. The probability of a molecule of dioxin escaping through all those barriers is practically zero, unless the whole thing had been left to corrode for several decades. Believe me, it's rare that a risk is reduced to zero! But the absence of risk had been completely obscured by the twists and turns of the hunt, and more deeply, by the reactions engendered by the dissimulation, the secrecy, the murkiness. That message had simply been

rejected. And curiously, even after the drums had been found, the mythical danger didn't disappear right away. There was an odd moment when one of the drums was opened. Some onlookers shuddered, even though quite naturally, all we saw was the clay around the inner drum. Even when faced with the physical object, people couldn't forget the images conjured up by their anguish.

P.L.: Now the business slowly begins to fade. On this second phase - from frenzy and complete confusion to the discovery of the drums - what lessons come to mind?

PH. Vesseron: It's important to have a logic, a guiding idea, flexible but solid enough to resist the ups and downs. For instance, requiring that all the players indispensable to solving the problem be there - whereas in times of crisis, the natural tendency is to handle only what's most pressing. Not leaving out those "peripheral" officials, not slipping into cursing "industry leaders in general," "those multinationals," or La Roche or Bernard Paringaux. Here again, the guiding idea would be to remember that an industry leader is first and foremost responsible for evaluating the decisions made, for controlling their execution, and for reacting if something goes wrong.

Another point: avoid bluffing and trying to look like you know it all. Our fellow citizens know full well that their government is not all powerful, and basically they're pretty skeptical when you tell them, "I have the situation completely under control." This type of language is of course meant to reassure and to prevent fears. But it's more than the public is asking for, and the public is more logical than you might think. You run the risk then of annoying people by giving them the impression of treating them like kids. You also leave yourself open to cruel surprises if the turn of events seems to show that everything wasn't under control. You have to realize that you may even commit this error without realizing it, so great is any public power's desire to be reassuring.

P.L.: You believe very strongly in management based on fundamental strategies. How did you perceive the behavior of our German neighbors, where the authorities set about proving how serious they were by turning every dump upside down?

PH. VESSERON: We were lucky in that area. Our German friends really did too much, and they made a tactic that could have tempted some people here look ridiculous. I understand quite well that the German authorities wanted to contain that paranoia, but was sending a bulldozer to dig up each dump mentioned in anonymous letters really the best approach? In France, when we explained that we would not follow up on anonymous tips that identified the drums in all four comers of the country, the reactions we got were not at all negative.

P.L.: But isn't it tempting to over-react almost systematically, in order to protect your image?

PH. VESSERON: Of course it's tempting, and there are always excellent minds who tell you, "That would be a politic response." In this area, I was

lucky enough to work for a minister who truly had a sense of what was politic and who didn't believe that worrying about her image in the short term was the best tack to take. Of course not everything can be mathematically calculated, and the primary function of political decision-making is to offer interpretations and strategies that aren't based solely on immediate constraints. However, it would be very dangerous to let everyone pretend to be a minister and invent pseudo-"politic solutions" in order to avoid dealing with the ecological, technical, or industrial issues with which we are faced. As for the ministers, they usually understand that exercising power should not be confused with doing magic tricks. Otherwise they don't last very long.

By letting each Land try to prove that it was the most diligent, our German friends quickly demonstrated what kind of result you obtain in trying to reduce anguish by raising the stakes. Those in charge are discredited, and the anguish, far from ebbing away, spreads and deepens.

P.L.: So you would refuse the shock treatment. You would try, insofar as possible, to remain rational.

PH. VESSERON: Resolutely so. But rationality here means understanding the risks involved in one decision or another. In the field of technological risk, we have to act, explain, and show our fellow citizens that the strategy adopted really does suit their interests - all at once. Trying to be rational doesn't mean the only thing that counts is the problem's technical aspect. There's nothing magic about communicating and developing a strategy, even if technology isn't the only issue. Basically, what seems important to me when making a decision about a matter involving risks - and where you may be worried yourself - is not forgetting that you have to treat the people involved like adults, whose questions deserve to receive convincing answers.

All-out responses, that promise total openness or zero risk, may of course create some advantages and ease tensions. After all, nipping anguish at the bud has its own interest. You just have to remember that history is never written in a single chapter. It's fine to handle the case of the waste from Seveso, but it would be illusory to think that it will be the last industrial waste problem. It's fine to handle the consequences of a fire involving a PCB transformer, but you mustn't forget that there will be others. If you begin to promise magic in order to get rid of one difficulty, a new event can arrive very quickly and poke holes in the scenario you've constructed. This is a frightful vicious circle that makes each successive problem harder to solve. To the contrary, I think that from each event you should try to draw all possible lessons that will improve your ability to anticipate.

P.L.: So you think that even in a crisis, it is necessary to focus on the most general system and on the long term; it's always necessary to introduce a learning dimension and not treat exceptional circumstances as though they were completely separate from everything else?

PH. VESSERON: Technological risk is not a subject of daily concern to the press and the citizen, and rightly so. If it were, we would limit ourselves to a

succession of video-clips, all on the same scenario: a frightening and damning image, an authority announcing that it takes the event very seriously, then indications that there is no actual danger. Nobody would be really convinced, but we'd move on to something else. This blow-by-blow approach to catastrophe seems to be the opposite of what our society needs, which is serious, tenacious, lucid prevention, for one, and in-depth defenses, for another, so that accidents don't mandatorily degenerate into catastrophes or suddenly trigger a profound disturbance in how the country is run. You can't improvise prevention and capacity for response. You build them up by learning progressively, as the Army well knows. What seems indispensable to me is not responding to crises like the drums with purely short-term preoccupations, as though they were just a media distraction that would be played out more or less well. Each episode of this type generates powerful images that will progressively mark our risk culture. In this respect, even false crises are important - they carry us forwards or backwards, depending on what we do and say.

P.L.: In aviation, they say you have to pay as much attention to a near-miss as to a real accident. But isn't that perfectly obvious in any phenomenon where there are worrisome risks?

PH. VESSERON: In this matter, let me repeat, there was no real risk, there was primarily a scandal born of a chain of clandestine behavior accepted by a company from whom everyone expected greater discernment. That's basically why the media and public opinion pay more attention to technological risks than to natural ones, or to collective risks, like driving a car, even though these are much deadlier. In my opinion, this apparently paradoxical attitude expresses a very simple reality: the essential characteristic of technological risk is that preventing it depends on implicit or explicit decisions made by our businesses or by the state - and not on chance, God, or Nature. Everyone expects that these decisions will be reasonably thought out and honestly explained. That's a tall order. But at the same time, expecting industry leaders to tell us how they master their tools is also a way of paying tribute to their responsibility and their independence, and of affirming that the results obtained are first and foremost the fruits of their efforts.

Of course, as soon as you have to demonstrate that things haven't been left to chance, such a demand calls for specific responses - technical ones, firstly, but also organizational and legislative ones. Oddly enough, even though the country is pretty aware that there's no such thing as "no risk", and even though the model of arrogant and omnipresent government is no longer accepted by anyone, administrations often feel obliged to prove that their task is to guarantee absolute safety. By trying to prove too much, they give themselves an impossible mission and actually contribute to creating instability. Whereas the primary goal of an administration, like a business, is to create management capacity, to show that it is credible, and to ensure that it won't be shaken if an incident or an accident does actually happen.

P.L.: More specifically, we always seem to be one war behind in terms of public communication. How do you see the situation today, when the watchword (at least officially) is total openness? What rules do you think should be applied in this type of circumstances?

PH. VESSERON: Basically, avoid closing up, and know that the next question may be even more disturbing. Above all, don't try to reassure people until tomorrow. It's fairly satisfying to see that recently, the tone adopted after an accident is no longer the conventional "everything is under control." It runs more along the lines of "there are certainly problems, but we'll tell you everything and do as much as possible to reduce the risks." No one really believes that an industry leader makes safety-related decisions without worrying about what they will cost. Nor, obviously, do ministers and prefects, who are responsible people, make their decisions based on the idea that anything is possible, that money is no object, and that nothing would be worse than to be accused of skimping. So why get locked inside a restrictive vocabulary, with an unreal tone? To show in a credible manner that there are guidelines, you have to avoid being simplistic. Don't try to cover up choices, arbitration, or strategies - to the contrary, bring them into broad daylight, use the least reductive images. This is the way to develop an openness that goes beyond short-term imperatives and that isn't limited to the necessarily anecdotal aspects of each new plot twist.

To develop credibility, I think it's essential to know how to take risks, hi particular, take the initiative of talking about an issue before it has been raised. Be wary of the fear of causing fear. If public opinion or the press is only interested in a narrow aspect of a risk, and a secondary one as well, in my experience you have to move quickly to re-establish priorities among issues.

Otherwise, there is a very high risk that once you've replied more or less easily to the first question, people will reproach you with having dissimulated more troubling uncertainties. In my eyes, the important thing is your room to manoeuvre, which you are constantly rebuilding: the capacity to guide the way events unfold, the capacity to anticipate questions that haven't been asked yet. Communicating openly doesn't simply mean following where the questions from the press lead you.

P.L.: That means in this business, it should have been made clear early on that the issues were much larger than tracking down forty-one drums.

PH. VESSERON: Given the circumstances, it was obvious. The task was to take apart the mechanisms that had generated those fears, without limiting ourselves to dealing with the twists and turns taken by events. It was certainly necessary to get the drums back on the right track, but also to show that in a modern country, the risks involved in the chemical industry have not been left in the hands of shadowy mercenaries; that industries do assume their responsibilities; that the state is alert and is not powerless against lawbreakers. It was much more serious than simply finding the forty-one

drums, even if the very responsible behavior adopted in the end by Hoffmann-La-Roche did play an important symbolic role.

You can see with the problem of PCB transformers that there are dangers in insufficient responses. That's another highly media-sensitive case, also bound up in the issue of dioxin, but unfortunately it wasn't put into perspective. I greatly fear that we will be reduced to vainly piling up regulations, taxes, and specific actions at an ever-increasing pace. The original desire may be to calm a fear or draw some kind of profit. But the basic result is to fan a fire started with a marginal danger and finally to create a situation that escapes from any normal means of regulation.

P.L.: In a crisis situation, good common sense always plays a crucial role. What do you do about the tendency to think that "where there's smoke..."? Say that a nuclear power plant has a problem - you shut down five to show that you're really serious about safety issues.

PH. VESSERON: YOU certainly have to know how to react to events and understand the consequences. But our fellow citizens are not stupid. If that decision is purely motivated by demagoguery, then how can you answer those who call for closing all the plants? I think the basic rule is, you should be able to explain and justify the decisions you make. Exorcism is a pretty feeble answer, and it shows disdain for the public opinion it seeks to appease. If you yourself choose to stand on irrational grounds, you're taking a risk that will very likely provoke further destabilization. When you're already in a crisis, playing with fire isn't necessarily the smartest thing to do.

BERNARD FAVEZ

# Nuclear power plant incident
# Network failure

January 12, 1987

## Background

On January 12, 1987, Electricité de France (EDF) was confronted with a situation that was awkward to say the least: a totally unforeseen accident for a nuclear plant; the partial failure of the distribution network (the public mind was still haunted by memories of the total blackout on the national network on December 19, 1978). As a backdrop, EDF was in the midst of salary negotiations. The previous week had been punctuated with strike-related power failures which had exacerbated public opinion, and the extreme-right Front National party had even planned a demonstration for the evening of the twelfth to protest these repeated power failures.

"At about 9.30 am, unit 1 of the natural uranium gas-cooled nuclear plant at Saint-Laurent-des-Eaux underwent operating difficulties when its pumping station, located on the banks of the Loire River, became suddenly ice-locked. The lack of cooling water had several consequences: the loss of the main turbo-generator sets: the loss of the emergency turbo-generator sets supplying electricity to the plant's auxiliaries; and a reactor scram. First, the auxiliaries were switched over to the grid (that was in good operating condition) in order to ensure reactor cooling. Then, because the unit was at shutdown, the cooling water supply was sufficient to operate the turbo-generator sets supplying the auxiliaries. These sets were brought back on-line approximately one hour after the incident began. In this way, it was possible to continue shutting down the reactor under normal operating conditions.[1]

"Between 10.55 and 11.41 am, three of the four available units at a power plant in Cordemais, in western France, were disconnected from the grid following technical incidents of various origins. When these incidents occurred, demand in western France was all-time high. The reduced output at Cordemais caused a sharp drop in voltage, which led to the disconnection of unit 1, the remaining unit available at that plant and of several other units in the western half of the country... At the same time, several high-voltage lines were automatically cut off. As a result, Britanny was left entirely without electricity. Rescue

1. Source: internal memo from SIRP, EDF's information and public relations department, sent to unit leaders and public relations correspondents at 3:54 pm on January 13.

operations and efforts to restore the grid began at 11:46 am. These consisted of load shedding operations undertaken by the dispatching centers of the western half of the country; using the maximum capacity of gas turbines in the West; increasing the power output of available EDF units; and importing power from neighboring countries.

• Probability of such an event: The scenario of four units on a same site disconnecting within a few hours, for different reasons, on a day when consumption is exceptional, can recur, by pessimistic estimations, once every fifteen to twenty years.

• Propagation of the accident: Generators in all plants are equipped with protective devices that separate them from the grid automatically when the voltage dips excessively, in order to prevent damage to them. Because the closest thermal and nuclear units detected the voltage dip, they went to zero load. This caused the voltage disruption to spread from West to East. Without the utility's rapid reaction, the result would have been a total blackout. By immediately undertaking load shedding in Britanny, the Nantes agglomeration, and a part of Vendée and Maine-et-Loire (districts lying south and east of Nantes), operators protected two-thirds of the network from being affected by the power failure.

• Delays in restoring service: The cold slowed down the process of restarting Cordemais, and various minor internal problems delayed restarting several nuclear units that had been automatically tripped following the voltage dips".[1] The radio audience for the 1:00 pm news was left with a strange impression. On Radio France-Inter, one of EDF's information managers seemed almost unable to diagnose what had actually happened. On television (TF1), the manager of the Saint Laurent plant was interviewed:

*Plant Manager.* [...] for an hour, the only electrical resources we had to ensure the safety of the installation was the national grid.

*Journalist:* In other words, if during that hour the grid had failed, you would have had no electricity to ensure the plant's safety?

*Plant Manager:* Absolutely none. But provisions have been made for that scenario, which has been studied. We then have four hours to restore power sources and ensure reactor cooling again before anything unpleasant happens.

*Journalist:* So this morning, in one hour you melted the ice, and water could get in again and cool the reactor. If the failure had lasted longer, if it had gone beyond four hours, would we have run the risk of a Chernobyl type accident, of overheating the reactors, or of some other catastrophe?

*Plant Manager:* In the extreme case, that is the type of accident that could take place, but you should know that such an accident could in no way reach the scale of Chernobyl.

*Journalist:* In your opinion, was this a hot situation?

*Plant Manager:* Let's just say that we found ourselves in an uncomfortable situation that it was very unpleasant to be in.

That evening, an almost identical scene was played out on another TV station, Antenne 2. An expert journalist commented, "You heard it, at Saint Laurent des Eaux the situation was hot, and all because of ice cubes, as though they hadn't been taken into consideration during construction. And that's not all, further down the Loire, at Chinon, there again, ice blocked the water intake units of the cooling circuit - so attempts were made to remove the obstacle with dynamite. The soldiers called to the rescue tried, but in vain. Worried that the ice couldn't be removed in time, operators feared they would have to shut down the three reactors. Yes, our nuclear power plants are decidedly vulnerable to the cold."

We will re-examine this day with Bernard Favez.

1. Source: internal SIRP memos, January 13, 1:06 pm and January 16, 10:37 am.

P.L.: There you were, that January 12, apparently thrown into a series of trials that seemed to accumulate in a problematic way.

B. FAVEZ: In a business such as ours, re-establishing normal operating conditions is the task of the permanent operations managers. Our personnel has been normally prepared to face this type of situation. A crisis is obviously that much easier to get through if people aren't caught completely off guard and surprised when something happens. In particularly difficult cases, they nonetheless have logistical support from specialists in the central department (assigned to managing our nuclear installations, these people are regularly trained to act, using simulation exercises). But in the cases that emerged on January 12, technical management of the crisis remained exclusively in the hands of local managers. So the Paris level and the general management didn't really play an active role in the events in question: we simply kept an attentive eye on the conditions for re-establishing normal service.

As far as Saint Laurent is concerned, managers on site were in fact surprised by the event, but they found themselves in situations for which they had answers. They knew what to do, so they didn't call on national backup capacity. I think the Saint Laurent matter took on the appearance of a crisis more because of the lack of skill with which information was expressed than because of the event itself. In other words, the failure of the primary cooling system had indeed brought down one of the barriers in the security system, but there were many more behind it that weren't touched. The people on site didn't go into cold sweats. You also have to remember that there is always a time dimension in the nuclear field - we have certain amounts of time in which to act, which helps us stay calm.

In any operating incident, there is a rule that says to speak to the outside, and better a bit too much rather than a bit too little... and this expression toward the outside is, I think, where the words and intonations weren't sufficiently controlled to avoid giving outside observers the impression that we had squeezed by a truly grave event - when that wasn't the case. But when the answer to a very natural question - "Was there a Chernobyl-type process underway?" - was, "We had four hours," an ambiguity appeared that I think created the event rather than describing it objectively.

In any case, we created a crisis there. But I don't think having real difficulty in controlling the systems is the same as having difficulty with the media. I repeat, in this matter Paris did not intervene at all - the people at the plant applied the procedures, took things in hand, and re-established normal service conditions in the normal time limits. After that, we basically focused on channeling all the worry that resulted from using the term "Chernobyl". So we used the information system to attempt to bring things back into proportion.

Of course we could point out that what happened was not entirely satisfactory: the Loire river ferrying ice cubes that get caught en masse in the drum filters is not something that is normally supposed to happen -so we took steps to try and improve the existing systems. I am not minimizing this accident, but I don't think there is a lot to learn from it in terms of crisis

management - except, once again, to observe that by having a slightly insufficient control over what was said, we created a situation that was in fact difficult.

P.L.: That day, people also thought there was a link between the failure of the network and the problem at Saint Laurent. The idea got around that in the final analysis, the plant's safety depended, once the failure took place, on whether the network held up - and the network was collapsing. Was there a misunderstanding?

B. FAVEZ: That's the understanding that naturally comes to mind, but it wasn't confirmed by the facts.

P.L.: So you weren't confronted by the two problems overlapping?

B. FAVEZ: No.

P.L.: And was that always clear to you, during that day?

B.FAVEZ: Yes.

P.L.: So all you had left was the network...

B. FAVEZ: And that was a true incident, which had grave consequences. We actually know perfectly well that these failures can occur. Even if we take lots of precautions (though without reaching the security levels for major-hazard installations), major networks undergo incidents of this type at intervals of a few years or a few decades. In fact, that seems to be just about inevitable - carrying security for these systems much further would require intolerable expenses. This is why operating centers have procedures that theoretically allow us to limit the extent and duration of an incident.

On January 12, a succession of incidents occurred (for the most part not interrelated) in an electricity production plant on the Loire estuary. This series of failures created a situation on the network that forced us to use load shedding - we could no longer respond to the entire demand in the western region of France. Measures taken by the operating center in Nantes (which manages this zone) were not sufficient to control the phenomenon. A process of collapsing dominoes developed, and the incident propagated as the nuclear plants east of the zone disconnected. The personnel in the operating centers went into cold sweats as they watched the propagation: they wondered when it was all going to stop. Because the networks were powerful enough when things reached the Paris area, the Seine, and the Massif Central, the process stopped there.

The news arrived a few minutes later at this site. But the whole responsibility for technical management lay with the network operating organization: the national dispatchers (right here in Paris) and the regional dispatchers involved (i.e. for the greater Paris area, Normandy, the West, and the Southwest). Naturally, in a situation like that, the top management is a bit curious about the series of events and the expected and actual conditions for re-establishing service. So some of them rushed into the national dispatching rooms - not into the actual operating rooms, where operators are protected from outside intervention, but into an observation room - to get a feel for how the people operating the systems were taking things in hand.

The January 12 incident was just about normal, so to speak, at the beginning - it was one of the things, as I indicated, that can happen and that don't surprise us. But we were still a little astonished to see how certain nuclear power units behaved - they seemed to have been a little eager to look after the "health" of their electrical elements (the generators - nothing to do with the nuclear elements). And, concerned about this "health," they were a little quick to disconnect from the network. That's the result of a doctrine: we ask the machines to do all they can to make their greatest contribution to the network, but without going to the point of putting themselves in danger (for example, of overheating their windings). When you find yourself in such a situation, you prefer to disconnect the machine and keep it in good shape rather than to ask it to make an additional effort that could provoke a breakdown which would make it unavailable for a long period. This incident revealed that certain machines were a little "selfish" compared to the objective capacity they could provide to the network.

But the fact is that they ended up in that state and that we went through a very uncomfortable situation all afternoon during that black Monday. The majority of the machines - not to say almost the totality - had been separated from the network and could only be restored again many long hours later. Hence a slightly stressful situation in the operating centers. Don't forget that the way things evolved depended exclusively on the managers and operating crews in the plants.

The procedures for bringing them back into service turned out to be particularly long - you could say abnormally long. But we actually have no way of interceding to accelerate the performance of these procedures. Of course, after the fact, by doing in-depth analyses, we could define progress to be made in managing these situations. But in real time, the only reasonable attitude to take is to apply the procedures. At the time, you ask yourself questions, you ask the managers, all the while trying to reduce the number of go-betweens and to avoid distracting people from their primary responsibility.

That case no doubt highlighted some of the gaps or inefficiencies in the internal liaison and information systems. It would be good for the production centers to be rigged a little better than they are today in terms of internal communicators. In times of crisis, as everybody knows, those directly in charge have other things to do than pass information along to the upper echelons. Even though the upper echelons would really like to hear from the mouth of the plant's managers what state the installation is in and what the outlook for restoring output is.

We didn't have to provide skills support in the return-to-service operations, either for the plants or for the operating centers. But - especially since the clientele was very sensitive after the power failures linked to labor conflicts during the previous week - we encountered problems in managing information that were no better handled than the technical difficulties I've discussed. The episode revealed that people basically expect information on how long the phenomenon is going to last. How to communicate and maintain

hope? I think that there as well, there are important lessons to be learned from the event.

P.L.: What was the most difficult moment? When the midday news broadcast arrived and you had to talk to radio stations without knowing where things stood?

B. FAVEZ: That depends for whom. I think what was most difficult for us was not being able to obtain a clear picture for ourselves of how the process of restoring service was going to unfold. For me at least, the problem lies more in responsibility for the operation, for continuity of service, than in responsibility for talking to the outside. I think that for emitting information, we are lucky to have some professionals at the national level who can work from a few slim, vague elements and manage to build a statement. I wouldn't say that this restores confidence, but even in the case in question, it gives the impression that the business isn't overwhelmed by the situation.

P.L.: But how can you give this impression of solidity when, as you say, within the business itself, everyone is in the dark? No one knows what is going on or how long it will last.

B. FAVEZ: Each plant fairly quickly announced perspectives for coming back onto the network that kept the failure within proportions that were still reasonable. But in fact, in most cases, the operations managers had been overly optimistic. The return times they announced were much earlier than what happened in reality. Here, at 1 or 2 pm, based on information from the plants, we couldn't have imagined that some clients wouldn't be restored before 9 pm. We thought things would go faster. That may be one reason why we stayed so serenely calm. But even if our information had corresponded to the reality we later observed, I have to admit that we wouldn't have had the means of acting to accelerate the process.

P.L.: That's just it. You've certainly identified some interesting points in terms of errors not to make in a similar situation; for example, not to disturb plant managers or dispatching center personnel constantly. You may have noted other impulses that you would be tempted to follow but that are only sources of further perturbations?

B. *FAVEZ:* I think that for events like those, it is really absolutely necessary to have codified procedures and behavior for all the actors. Progress can be made, but we already have a relatively efficient organization. We can isolate the actors and let them work. But while this organization ensures the operators' comfort, it doesn't produce enough of the information that is indispensable for the external management of the crisis. For my part, I am nevertheless convinced that these things cannot be improvised. Only by planning, anticipating, and simulating can you define the means and how to apply them.

P.L.: When a crisis hits a large, complex system, it's too late to change its operating rules. But isn't there a huge temptation to scramble everything, make demands, apply pressure, take shortcuts anyway?

B. FAVEZ: I think that's fairly natural. But I believe it would be dangerous to get people worked up. With the organization and the degree of training

these people have, with their awareness of their responsibilities, I don't think that would facilitate the process of returning to normal. On the contrary, to get the best from everyone, everyone has to be convinced that they are trusted and that they have to display all their skill.

P.L.: What about having to manage several crises at the same time, like Saint Laurent, the network, and labor negotiations?

B. FAVEZ: No. There was a time separation between Saint-Laurent and the network accident. We didn't go through any of the stress that we could have if the network event had occurred during the Saint Laurent accident. As for the labor negotiations, I won't say that the top management is plethoric, but tasks can be shared.

P.L.: You've just emphasized the necessity for top-level management to let its technical managers work in peace. The same question no doubt applies for you: you could be constantly bothered with calls, requests, and summons from outside organizations. Aren't there difficulties on that side?

B. FAVEZ: With regard to the higher public authorities to whom we have to answer, we try to take the initiative in providing information. That is very comforting. Waiting for the question puts you in a much more difficult situation. So when an incident is fairly serious - and in any case, when you know that the media will build it up - our rule is to take the upper hand by informing our supervisory government authority and certain major ministerial cabinets. By just picking up the phone, you can acquire a relatively large amount of freedom.

P.L.: But you see the difficulties in this type of initiative - making rapid statements of the type, "Something is happening, we're not too sure what, and we don't know how long it will last." That isn't what those people want to hear.

B. FAVEZ: I think they are more ready to hear it than public opinion is. I think that in those kinds of contacts, the notion that "to err is human" is much more solidly established.

P.L.: To get back to my question: didn't you have to undergo what you spared the plant's manager, that is, being constantly hammered at by people who wanted to be informed?

B. FAVEZ: No. In this particular case, the operating managers for the areas concerned were the targets. It didn't reach the general management.

P.L.: But that could be a problem.

B. FAVEZ: That could be a problem. We have a crisis organization that lets us focus this type of call on a special room which is used as necessary. In any case, this is what exists on paper, and we've tested it with exercises. This means that handling telephone calls is really considered as one element of crisis management. We can't avoid it, as we saw in other accidents, on the low-voltage networks in Paris during the cold spell.

That was another crisis - and we really weren't prepared for this type of failure of the low-voltage network. We were for the high and very-high voltage networks, because we've had some very tough moments in past years with distribution in regions affected by problems with wet snow, which builds

up on power lines and can pull them down. An information structure exists for those episodes, but it hasn't been extended to cover all the distribution centers. And when something like that happens in a center like Paris, we are very vulnerable - and it hurts us. Communications difficulties amplify greatly the bad performance caused by the loss of power. Not being able to take the initiative with information - and thereby let victims believe that we are in control and that power will come back on as soon as possible - is very annoying. Everybody knows that when you don't take the initiative in giving information, it gives an impression of disorder and incompetence.

P.L.: Generally speaking, based on the crises you've been through, can you list a certain number of crucial lessons?

B. FAVEZ: I think I've used most of the key words. The absolute priority, without imagining that you can avoid every serious accident, is to have the means available to control the phenomena in any circumstances. Afterwards you can talk about crisis management, but the first thing is to have the conviction that accidents can happen, and to acquire the skills and means to let you reduce the probability that they will.

If despite this, you reach the brink of catastrophe, a second imperative is not to stand there gaping at the phenomenon, but always to have a force ready to intervene, in the broadest sense of the term.

Next, for management, I think the key word is confidence. The goal is to maintain confidence - I say maintain, assuming that it already exists. That is another mandatory condition for preventative management. I don't think you can justifiably hope, in every circumstance, to supply perfect (or at least sufficient) explanations in scientific and technical terms that will convince people. But you have to be able to inspire confidence - which implies a professional approach in designing your message.

But that isn't all. I mean that one of the essential qualities of a message is its coherency and its continuity. In businesses like ours, one of the main problems is the variety of possible spokespersons: even with the best possible intentions and the greatest intellectual honesty, there is a major risk of discrepancies in expression, which can undermine confidence quickly and deeply and make the company look like a holdout for liars and thieves. I think that's the greatest danger. But it's also difficult not to allow so-and-so to speak. That's something else that destroys confidence: the filter. This, by the way, is why we have always vigorously opposed the tendency for public authorities to give the prefect and the prefect alone the right to speak out during a crisis: I think it's totally unrealistic. There will always be several voices. Especially because deep inside every individual, there is a television star waiting to be born, and a crisis is a beautiful opportunity to be on TV. I think there's progress to be made there - in discipline and organization. Before one or another potential actor goes on the airwaves, it is absolutely imperative that he have an idea of the backdrop against which he will speak. And I repeat, the goal is not to hide reality. The purpose is to make everyone appear to be a member of a team. In addition to the star syndrome, there is

also a slight tendency, when a system is complex, to adopt a tone that shifts responsibility for the situation, more or less implicitly, onto someone else.

P.L.: Insiders or outsiders?

B. FAVEZ: Insiders. In systems like ours, there are people who manage operations and people who manage resources: it's human, it often looks like somebody else's fault. But if you get into a process like that with regard to the outside, the catastrophe is amplified.

The only right approach is an approach that anticipates, prepares, that uses operating techniques and exercises to let people do their work well and to maintain confidence on the outside in the professionalism of the people who are in there. Just because there's a snag doesn't mean you're good for nothing. In fact, that's why, in these anticipatory and preparatory steps, I think it's essential to let public opinion know what kind of accidental events could arise. Not to banalize things, but to make sure that when a serious event does take place, it doesn't fundamentally surprise people. I think today that we should try to make public opinion see that an incident on the network is something that can happen, at any time, but infrequently enough that it is tolerable - make people admit that in the neighborhood of a nuclear reactor, it isn't impossible that one day radioactive materials will be released into the atmosphere - but that that doesn't necessarily mean we fall into a catastrophic process. These are anticipatory steps that contribute to the effective management of crisis situations.

Another point: in the days that followed, there were a few information initiatives taken towards the outside, in somewhat random order, that could have had negative side-effects on the image of the firm. That also taught us something: in addition to worrying about handling communication during the crisis, you have to take care of the follow-up on the incident - because at that point, you find the same star syndrome and the same rejection of guilt. This leads to messages that suffer from a lack of coherence and objectivity, and these can affect the whole system. I think there are moments when self-criticism taken too far doesn't have a positive effect. I don't think it's advisable to say systematically, "We're no good." It may be true, but it's better to focus all your efforts on improving than on confessing.

P.L.: If we move outside of your field, would you have any observations to make? Because the risk of crisis exists in many other areas.

B. FAVEZ: I think those systems are intrinsically no less governable than ours. In the management of those businesses, there is no laxism justifying the fear that the necessary levels of competency and seriousness I mentioned are not observed. This is why I tend to think that in this technically developed world, aware of its responsibilities, major hazards really are, it must be said, under control. The installations in question are subject to very systematic protective and inspection measures. Even if these don't eliminate the hazard, they keep it constantly under control. If the fundamental nature of an industry didn't allow such conditions, then I think it should be condemned. But I don't think that in the western world, we are exposed to such dramatic things.

I think there is no other solution than to refuse to banalize in the short term, and to remain vigilant. To do so, there aren't a hundred solutions. You can call them audits or exercises, but there have to be regular outside interventions, and operating managers should feel they have to face them constantly - demands that can be made at any moment. It is important to maintain this system of verification, of quality control, and not give in to the temptation after a while, after observing that the system hasn't turned up anything abnormal, to say, "Call it off." That temptation is very strong, even more so because vigilance is expensive, and it's a little stressful. The arguments come rapid fire : "Really, that's not worthwhile, we can get rid of that control." And that's the beginning of the end.

Our own policy is to maintain the frequency and the intensity of control and vigilance measures. In less dangerous fields of management, after all, it has been observed that when you reduce the frequency and intensity of verification operations, that's when the errors appear.

CLAUDE FRANTZEN AND LAURENT DU BOULLAY

# The DC-10 crisis

May 25-July 13, 1979

## Background

On May 25, 1979 a McDonnell Douglas DC-10 operated by American Airlines crashed as it was taking off in Chicago, causing 275 deaths. Another DC-10 had already been involved in an accident on March 3, 1974 at Ermenonville (not far from Paris), causing 346 deaths, one of the biggest disasters in civil aviation history. In Chicago, an engine had apparently fallen off in flight. By May 27, a first series of inspections involving the pylon that attaches each engine to the wing had been prescribed for all DC-10s. In light of uncertain results, a second, more specific set of inspections was defined and ordered immediately on May 29. Basing itself on a rapid study of the information collected, the United States Federal Aviation Administration moved on June 6 to ground all DC-10s. At first, the rest of the world followed the American lead, and all fleets of DC-10s were grounded. This primary crisis gave rise to a "false" -though highly instructive - crisis involving Europe's Airbus. Had this secondary crisis been poorly handled - and there was every reason why it could have been - it, too, could have lead to unpleasant developments. Europe eventually decided to put its DC-10s back in service, in opposition to the American decision. Other continents came to see the Europeans before setting their course of action.

Here, then, is a case of a domino effect hitting a system operating worldwide. This crisis is different from those seen at Seveso and Chernobyl. The issue is not a potential long-term effect on numerous third parties, but the immediate management of a very large-scale system.

Claude Frantzen and Laurent du Boullay agreed to discuss this matter with us. In 1979, they were working at DGAC (or Direction Générale de l'Aviation Civile), the civil aviation authority in the Ministry of Transportation as associate director in charge of technical supervision and head of the certification office, respectively. In short, they were responsible for administrative actions ensuring aircraft safety and safe operation. Both had been trained in France's finest schools, and both had begun their careers as flight test engineers. When these events took place, they each had some fifteen years of professional experience behind them, including ten in the safety field. This interview took place eight years after the events. No previous research work was conducted to refresh memories. A few key facts were verified after the interview and, in the rare cases where it was necessary, corrections were made. More than reviewing a historical panorama, this document attempts to reveal how these two protagonists experienced a specific crisis, and what traces it left in their memories.

Just before the interview began, Claude Frantzen had been handling another matter that had some points in common with what was to be the subject of our discussion (though on a

completely different scale). An incident without consequences had occurred on the ground, involving an aircraft belonging to a French airline. The safety organizations were wondering whether, as a preventive measure, flights of other aircraft of that type should be suspended or restricted.

P.L.: May 1979 was marked by the Chicago catastrophe, "yet another" DC-10. How did this event hit you? What were your first impressions?

L. DU BOULLAY: First, you have to clarify the general context in which we heard the news. Civil aviation is a complex and highly-organized system in which there are established procedures and clearly distributed duties. The first reaction is to set this system, which is tried and true, in motion without trying to tinker with it. An accident triggers a large number of investigations: in addition to the country in which it takes place, the country that manufactured the aircraft is directly concerned (in this case, it was the United States on both counts). This means the Chicago accident didn't bring official French civil aviation authority directly into the spotlight, even though UTA, a French airline, did use this type of plane. You have to make sure the system is working normally, i.e. that the countries involved are indeed applying the appropriate rules and practices. This is no problem with the United States. So we didn't feel there was a particular emergency or panic. After an airplane crash, you don't have to deal with the kind of problems that arise at Seveso, for instance. However, it is good to follow the story in the press, which already gives a very rough idea of the causes of the accident. We also try to get more specific information from the manufacturing country, which always follows the event very closely. But there's no burning emergency, because even if there are safety measures to be taken for fleets of similar aircraft, these are determined and announced by the manufacturing country.

CL. FRANTZEN: To be more specific, let's say that we learn about the event through the press, because the press moves a lot faster than our information systems. Not that this is a problem: for us, information without some kind of analysis is of no use to ensure safety. What interests us is the analysis of the information. What did we learn from the press? Television stations aired an amateur film showing an "engine bolt" (be careful with such terms, they can create misunderstandings, as we'll see later) that had fallen off the plane. So the event wasn't related to weather conditions. This wasn't a plane crashing into a mountain, it wasn't a pilot who had mishandled his machine. It was therefore very likely a technical problem. All we could do was wait for the manufacturer to do his duty and be ready to hear his observations.

We knew, of course, that the event would touch a nerve in public opinion, since DC-10s did not enjoy a very good reputation, especially after the Ermenonville accident. But for a technician, at first glance the films by eye-witnesses that were shown on television didn't suggest the slightest possible link between previous accidents or incidents and the Chicago malfunction. That didn't prevent public opinion from perceiving the DC-10 as a plane under a curse, or cultivating suspicions about the manufacturer. As for us, we

also knew that there were hundreds of DC-10s in operation, with millions of accumulated flight hours. So for us, there was no need to panic. Even more so since the wave of public protest began in the United States - that's where the accident took place, and where the newspapers had published eye-witness accounts and horrible pictures. We kept our ears open, but we weren't in a crisis.

P.L.: But you knew that UTA, a French airline, had a fleet of DC-10s and so could be concerned by a problem involving that type of aircraft.

L. DU BOULLAY: Of course. We knew it would be concerned by any safety measure, just like all the other airlines using DC-10s. But we also knew that even if there turned out to be grounds for limitations in order to ensure safety, there is a whole range of limiting measures adapted to the risks that have been revealed. Grounding all planes because you know no other way of ensuring safety is a rare measure, a last resort. One thing is certain: the accident in Chicago wasn't an enormous event that hit us broadside. Only one thing bothered me in the days that followed: I was told that French television was airing an American broadcast in which an inspector belonging to an official American investigative body which was usually very circumspect about the statements it issued - this inspector was shown on television with a bolt in his hand.

CL. FRANTZEN: Thirty-six, at the most forty-eight hours after the accident-

L. DU BOULLAY: -saying, "This was what caused the accident." Our experience has proved that on a machine like that, as complex, as highly developed, with millions of flight hours behind it - an accident is necessarily the result of another, extremely complex process. It can only be an accumulation of many little factors, each of which went wrong - and if just one had gone right, it would have been enough to prevent a malfunction from becoming an accident. This means understanding what went wrong is a lot of work. We just don't believe in accidents whose causes stand out like your nose in the middle of your face after just a few hours. That can happen, but you still have your doubts. An inspector declaring, "This is the bolt that broke!" has something fishy about him. But we nevertheless saw right away that the media were going to have a field day. For public opinion, if it was a bolt that broke, then the problem was easy to solve, "just a matter of kind of thing. Just a matter of changing the bolt, just a matter of firing the guy who screwed it on wrong, and so on. You can go home, the problem is taken care of - we've exorcized it. That's simplistic, but a simplistic message is easier to communicate to the public.

But we know that in all likelihood, in the hours or days that followed, someone would have to say, "No, no, it isn't that simple, and in fact it would be terrible if it were that simple - our system would be fundamentally flawed if it only took one cracked bolt, one worker who didn't do his job right, to trigger a catastrophe. Things are surely much more complicated." That's the second place where things can get out of hand. When you say it's more complicated, the public begins to have doubts. And that's when I thought to

myself, "Things are off to a bad start," first and foremost for our American counterparts.

CL. FRANTZEN: YOU have to realize too that once it had been established (after about forty-eight hours) that the problem was an engine that had fallen off and not, let's say, a pilot's error, then the matter fell into the '"technical" field and not "human error." This seems like common-sense, but the distinction between men and machines, with the latter not having the right to error, is totally false. We all know that when there is a technical problem, the crisis generally gets much hotter.

L. DU BOULLAY: Experience has shown that the media are more tolerant for the system in cases of human error (like the combination of misunderstandings in radio communications between the crews and the control tower that contributed to the collision between two Boeing 747s on Tenerife in the Canary Islands) than when there is a machine failure (which was the case in the accident at Ermenonville). This distinction is unfounded (don't all causes come down to human decisions?), but it just won't die, and it appears that the media respond differently in the two cases.

CL. FRANTZEN: So we were pretty uncomfortable with that simplistic presentation of the accident. And then there was the fact that it had taken place in Chicago -

L. DU BOULLAY: - and that the legal system in the United States doesn't operate at all like ours. We could just imagine a horde of powerful lawyers going to see the victims' families and saying, "Give me your case, we're going to make lots of money."

CL. FRANTZEN: We didn't have any specific emergency plan to put into action. We just began paying more attention, we fine-tuned our networks, we reinforced our contacts with UTA - which has its own communications channels with the manufacturer.

L. DU BOULLAY: And very soon, the second phase of the crisis began. The Americans did a better analysis of the accident and determined a program for inspecting and surveying all DC-10s. They even called another part into question besides that bolt they'd shown on T.V.

P.L.: Was the bolt hypothesis dropped after a while?

CL. FRANTZEN: In two or three days at most, the technicians had forgotten about the bolt. They found it was a different piece that had yielded. But there again, in our system, this is incomprehensible: it should never have broken. As a precaution, the Federal Aviation Administration (FAA) advised that a series of inspections be performed on this aspect of all DC-10s. This is a classic procedure: just two days ago, we made the same type of inspection on the whole fleet of another widely-used airplane. This is constraining: you have to remove a lot of parts, which keeps the planes on the ground and annoys the airlines somewhat, but everybody does these inspections very conscientiously. In the case of the DC-10s, we had UTA do them. That naturally forces us to survey things. We of course assume that we can trust the airlines, but we do

our job, which is inspection. Everybody plays his part. So this matter was beginning to give us work, but it was pretty conventional work. In our jargon, we say we apply the airworthiness criteria given by the Americans.

This type of procedure can start to make you tense. It's urgent, a long letter appears on the telex, full of standard but somewhat brutal expressions: "pursuant to the authority vested in us," "in accordance with article so-and-so," "following an accident which took place on," "the first indications show that," "in order to prevent this from recurring, you are requested, before -" and sometimes it's "before any further flights," but in this case, I remember well, it was before so many dozen further flight hours, which left us the time for the planes to finish a series of legs, and not just the flight in progress. So we were faced with a problem that was stickier, but it wasn't a crisis.

L. DU BOULLAY: There was another problem. There's a constant flow of data from operators toward the manufacturer to share the numerous observations made during routine maintenance on the planes. But when you launch a campaign of special inspections related to an accident, the manufacturer asks operators to collect and forward as fast as possible all the data gathered. The data flow increases - what's more, for obvious and understandable reasons, operators often do more than they are asked to, sending data that wasn't even requested. Inevitably, this feedback contains irrelevant elements. The result is, the background noise is so loud, it becomes harder and harder for the manufacturer to single out useful information. A mountain of material pours into the engineering department.

CL.FRANTZEN: And the press gets wind of it! In a case like that, the tone quickly becomes, "Wow! Look how bad these planes are, there are tons of bolts missing." To the technician, none of this data was really shocking, but for public opinion, it was horrifying. "These planes are made any which way, there are lots of pieces missing, as soon as you look close, you see how shoddy it is." This news was a little disturbing, first for our American colleagues, but for us as well. We had to be sure that each of these tiny incidents, which didn't seem crucial, hadn't played a small role - that none of these secondary points could be suspected of setting off a chain reaction. But once again, this sticky phase involved mainly the Americans.

L. DU BOULLAY: That much said, things were starting to get messy. It seems to me that very quickly there was talk of action by consumer associations. I mean within three or four days after the accident.

CL. FRANTZEN : Consumerism was riding high at that time in the United States.

L. DU BOULLAY: And the case had gotten into the press very quickly. It was starting to take on a larger dimension: suddenly the press worldwide was casting doubts on the DC-10.

CL. FRANTZEN: In order to sort out all the data feedback, a new series of mandatory inspections was prescribed by the FAA, much more focused than the very first series of inspections called for the day after the accident, on the part that "caused" the Chicago accident. That's when the Americans found a second plane that revealed a small fracture, what we call a crack, on the part

that was very likely the source of the Chicago accident. So the same type of phenomenon had been identified on another plane in the United States.

L. DU BOULLAY: That discovery changed everything, even if we didn't find anything comparable in France, or in Europe, or anywhere else in the world.

CL. FRANTZEN: We didn't yet know how to explain the phenomenon, but the tactic of saying, "It's something specific to the airplane that crashed in Chicago, so the rest of us can relax," had had the wind knocked out of it.

P.L.: So a shadow was suddenly cast on all DC-10s.

CL. FRANTZEN: Maybe not all, but which ones? Because it could be a series of aircraft, if it was a manufacturing problem (say, ten planes in a row on the assembly line). It could be the planes with model X of that part (because those things change all the time). It could be the craft of a certain airline, handled according to a given procedure. It could be planes repaired in a given workshop that operates in certain way. The last solution proved to be the right one, but we didn't know that yet. The problem is, you'd like to be able to say that a malfunction is specific to a single machine, and in fact all the efforts were oriented in that direction. Then suddenly, the scene changes completely, bringing panic in its wake: "What if all the DC-10s are that way?"

We have to go into a little detail about one particular facet of this business. The head of the FA A was on a tour of Europe at the time, a routine visit. While in London, he was informed of the discovery of another crack on another plane. But a further phenomenon then came into play. Court action taken by consumer associations cast doubts on the Administration's approach. To caricature (just barely), the idea of their petition was, "Why don't you ground all DC-10s until we've figured it out? Why not ground all aviation the world over, since any heavier-than-air craft is apparently dangerous?"

We have to look for a moment at this total flight ban, which was the subject of a fundamental misunderstanding between these associations and us. First of all, long experience has shown us that there is a wide range of measures that make it possible, even during a transitional period, and under serious constraints, to obtain a high level of safety. This means it generally isn't necessary to ban flights completely. Besides, when the planes continue to fly, under close surveillance, details can appear that will guide us towards a speedier analysis of the problem. Say, such-and-such airline uses a particular engine speed or certain maintenance tools - maybe that's a lead worth following up. Examining planes sitting on the ground will never give those indications. Stopping planes from flying deprives us, so to speak, of data that could be very useful. Last of all, using the ultimate weapon of suspending flights simply freezes the crisis. Experience has shown that it's much harder to put equipment or a business back into the air under the required technical conditions once it's been stopped, than it is to apply those same technical conditions while continuing to operate. This may seems like a paradox, but the interests of safety aren't necessarily served by acting precipitously. However,

this approach of not paralyzing everything simply does not go over with public opinion or with consumer groups. It seems incomprehensible: "So you want to use the passengers as guinea pigs!" We still believe that long experience has taught us how to strike a balance. But the associations usually refuse that. And they went to court.

That's the problem the FAA claims to have encountered. The day the news about a second fracture reached the press, a local judge in Washington, D.C. was reported to have stated, "If that's the way it is, I'll ban all DC-10 flights." Well, that's the American legal system. In France, a judge would be hard put to stop machines from flying - it isn't his job (he can only intervene after the fact). In the United States, a single judge could say, "I am stopping the flights of all DC-10s." This meant the FAA risked being cut out of the circuit, and safety still wouldn't be improved. Its reaction was, don't stop to think, we've got to move faster than the judge. So the FAA itself grounded all DC-10s. Another contributing factor in the mind of the FAA head - who was in London - was the classic reflex of decision-makers who are afraid of looking inactive or projecting a weak image: "I've got to decide something, I've got to do something." When he was told, "Technically, this raises questions; there's a second fracture of the same type on a second plane; and if we do nothing, there's a judge who will decide himself tomorrow morning to ground the planes", he gave his own order. "You will ground all DC-10s, immediately." And he got on a plane to go back to Washington.

L. DU BOULLAY: We should clarify this chronology a little. There were actually three technical stages. A first series of inspections provided the proof that fractures or cracks might have a relation with the accident, but it cleared any other DC-10s. A second series of more specific inspections was triggered as a consequence of the results from the first measures. Then, during a counter-check by FAA inspectors, cracks were "discovered" that hadn't been noticed before, on the pylons attaching the engines to the wing on two planes. This little fact, which later proved to be false, weighed heavily in the balance at FAA headquarters, where the information arrived during the night, a few hours before they had to go testify before the judge about the safety of flying these planes. It became difficult for the FAA to tell the judge, who wanted to ground these planes, that everything was normal and that they could go on flying.

CL. FRANTZEN: Technically speaking, the second series of inspections primarily served to confirm the specialists' suspicion that maintenance procedures were the source of the problem, rather than the machine's underlying design: "Something really exceptional must have been done to this part to make it break, something unrelated to the way an airplane is normally used." What remained to be uncovered was the connection between the plane in the accident in Chicago and the two other planes that displayed this abnormal condition. In a few hours, an idea took shape indicating that the connection was a specific maintenance operation. But when it was time to go before the judge, this capital development wasn't yet solid enough to be

included in the written testimony, and the judged forced them to move too soon.

L. DU BOULLAY: You have to understand the double difficulty the American administration was facing. First, there was the problem and its general context. At the heart of it was a mountain of data arriving from all over the world - you can imagine that in these cases, technical data and more or less twisted press information pours in day and night. Crowding in on this was the legal action that had been set in motion, bringing into play the full potential of the American legal system. Second, there was a timing problem. The news that two FAA inspectors had found two new, previously overlooked cracks, was received during the night before the interview with the judge. This later proved to have been an error on their part. But under those conditions, how could anyone convince a judge? The FAA didn't have time to check and to build its case. It was under the threat of seeing its executive powers transferred to the court. So by an administrative act, the FAA suspended the DC-10's type certificate and grounded the planes - all for nothing.

P.L.: This question of whether or not to cut short the operation of a complex system is classic. Could we examine it in detail? Is it enough to say that stopping an activity deprives operators of information?

CL. FRANTZEN: I would be even more harsh, and say that stopping a machine usually accomplishes nothing. That's the main reason why we don't do it! Especially when there are parameters we can adjust, using safety criteria. If we say, "A storm was an aggravating factor in a malfunction," then even before I know exactly what combination of factors was at work, I can very well give the order (to make a rough generalization), "Don't fly in storms." In another half-realistic example, say that you have doubts about the automatic pilot system on a medium-range aircraft. You can very well require that for a few days (it can't be an everlasting situation), the crews fly without using the automatic pilot. We can also rapidly take several other precautionary measures. Basically the idea is to guarantee safety by acting on the links in the chain that are most pertinent to the failure risk that has been identified. This may have a grave impact on the economics of operating the airplane, but that's not something you negotiate. I could give you dozens of concrete examples, we see them all year long, but I'd have to go into lots of detail to let you understand each case. In short, we have other means of acting on the system besides totally blocking it. That's why our approach - and experience shows that it is well-founded - says you very rarely have to have recourse to a total shutdown of the system.

But now I'm jumping ahead to the extension of the crisis.

P.L.: Exactly. Now how long after the accident did the directive grounding the planes come through?

CL. FRANTZEN: About two weeks later. But this is the extension phase of the crisis. It developed mainly in the United States.

L. DU BOULLAY: We actually had two focal points: the United States, where as we just said, there was clearly a big mix-up among technical, political, and legal considerations, against the backdrop of a very tense attitude toward DC-10s; and Europe, where the airlines, who operated about forty DC-10s, were sending up a great deal of data from the inspections they'd made. The result in Europe was, "Nothing to report," or at least nothing significant, since as we also noted, you always find something when you undertake such a large-scale analytical effort. I should emphasize how seriously this work is done. It is performed in-depth, in a network, by people who know one another well, and who do maintenance together for all of Europe.

CL. FRANTZEN: There were three hubs for maintenance of these planes in Europe. Swissair handled all the planes in the KSSU group (including KLM, Swissair, SAS, and UTA). Lufthansa took care of the Atlas group planes (which covers Air France, Lufthansa, Alitalia, Sabena, and Iberia). Then there's British Caledonian in Great Britain. This is vital: there are few maintenance hubs in Europe, which means communications are facilitated, as is the synthesis of the many observations made on the fleet.

L. DU BOULLAY: During the two weeks between the accident and the grounding directive, we saw the United States sinking deeper and deeper into their problems. But the European system remained calm. Nothing told us that we should suspend DC-10 flights.

CL. FRANTZEN: For the time being, only the United States was involved in the crisis process. This process culminated in a typical decision of the "I've got to do something to break out of the crisis" type. That something simply only made the crisis that much deeper: the FAA administrator made the decision to suspend all DC-10 flights, and right away, the crisis shifted and came into our front yard. Up until then, we had simply watched attentively, but we hadn't felt that we were in crisis.

The decision hit like a bomb. It wasn't the conventional type, requiring that "before any further flights, you must make the following inspection." This was without nuance: "You're grounded, and for the rest, we'll see later. Who knows when you can fly again."

L. DU BOULLAY: I think the first news hit us one morning via Tokyo: "We have information stating that the DC-10 type certificate has been suspended." Which effectively halts all flights for a fleet. In other words, the manufacturing country is saying, "I'm not behind you any more."

Cl. FRANTZEN: "I can't be of any help to you. My advice to you is to stop flying those planes."

L. DU BOULLAY: We thought to ourselves, "This is strange, there's something going on." But we didn't create a crisis unit right then. More specific information came to us from Washington around 11:00 that same morning (from people who'd gotten up early in America). That's when the issue hit home.

CL. FRANTZEN: What were we to do in France? We met in the director general's[1] office, and fast -

L. DU BOULLAY: - In about an hour. The very first question was, "Do we let our planes fly or not?" From a strictly technical point of view, we couldn't neglect the possibility that despite our information networks, the Americans might know something that we didn't. At that point, it seemed impossible to justify taking a different stance. So our first decision was to do as they did.

CL. FRANTZEN: In one hour, two or three simple ideas emerged. First, yes, we decided to suspend flights here. But we wanted to do more: we knew that the Americans were tangled up in their own legal and political problems. So we had to go to them. But where in the United States? To Long Beach, California, the McDonnell Douglas headquarters, to see the manufacturer's technicians and the FAA agents working with them? Or to Washington, where we would get more of the political, public opinion side, and where we could better judge the play between technology and politics? One practical criterion is that Los Angeles is more than twelve hours away by plane, and it was too late to have a flight that day. We could get to Washington that evening by taking the evening Concorde flight. From there, everything quickly fell into place. We had to send someone to Washington. But we also followed a strategic line: France shouldn't act alone.

P.L.: Can I stop you? You made a decision that large systems generally try to avoid, that of suspending activity. I'd like to spend a little more time on this. Didn't anyone stand up and say, "Leave the Americans in their political and legal quagmire - this will cost Europeans too much"?

L. DU BOULLAY: You have to realize how heavily the architecture of this worldwide system weighs in the decision-making process. Everyone almost always follows up on the advice of a primary country (the manufacturing country).

P.L.: All the same, in the realm of decision-makers, deciding to stop everything is very rare.

L. DU BOULLAY: You bet! In the United States - the leading air transporter in the western world - general stoppages of a fleet due to suspension of the type certificate have only taken place two or three times since the Second World War. And in none of those cases did that affect such a large fleet, operating all over the world.

CL. FRANTZEN: In my career, I've grounded a major plane model once, and that was six years ago. It took us a few days to get them back flying after having cleared up all the uncertainties.

P.L.: So in this case, you made the decision to stop flying DC-10s.

CL. FRANTZEN: Three of us made it: the then-director general, Laurent, and myself.

P.L.: And you felt it was okay to do so, you weren't afraid of paralyzing the situation?

1. Counter part to the FAA Administrator.

L. DU BOULLAY: Unlike Claude's decision six years ago, our decision was easy to make. Because in Claude's case, France was the primary country - we knew the world would do as we did.

CL. FRANTZEN: Whereas with the DC-10s, we were a secondary country. For us, the United States had analyzed the situation and assumed its responsibilities - so logically, we would follow their lead. Both intellectually and in press terms, you feel much more at ease. You aren't on the front lines with no one to back you up. And the rest of the system reasoned the same way: there was a Europe-wide decision to stop the DC-10s within the morning or the day. The worldwide grounding came within thirty-six hours.

P.L.: So you followed the U.S. lead, but as you've mentioned, you wanted to know more, and you wanted to take action that wouldn't be strictly French.

CL. FRANTZEN : Yes. Even though we followed that lead, we had our doubts. We wanted to see if we couldn't take a different approach. To do that, we needed two things. First, we needed information, so we had to send people to the source. Laurent can tell you about that - he's the one who went.

Secondly, we knew our position would be stronger if all of Europe moved as a bloc. For technical reasons: there would be more experts. And you never know how deep you'll have to go into detail, so increasing the number of experts isn't a bad idea - and for political and public opinion reasons: it would be better if the whole decision didn't come just from the three of us. If it came down to taking a position opposite that of the United States, you can feel the weight of an argument like, "America is huge, what do these three guys in their little comer think they're doing, saying, 'We're going to do the opposite of what the Americans do'?" But if we could reply, "No, there are also three British, and three Germans, and three Swiss, and three Dutch, and three Swedes..." (and whoever chooses to jump on the bandwagon afterwards) - then you feel much stronger. So we put all our effort into organizing Laurent's helter-skelter departure and getting the wheels of the European network turning.

L. DU BOULLAY: That was a particularly heavy afternoon.

CL. FRANTZEN: We divided the tasks very efficiently. The director general took charge of the media aspects of the problem - presenting and explaining the worldwide architecture of which we were a part. Laurent du Boullay took on the technical side and got ready for his trip.

L. DU BOULLAY: I prepared the trip with a more highly specialized engineer who was to travel with me. And Claude Frantzen rallied his European counterparts, saying, "If you can take the plane with us this evening, it would be great."

CL. FRANTZEN: First off, we managed to hook up with a Swiss initiative which we then incorporated into the whole process. A representative from the Swiss aviation administration had just flown off to Long Beach. So we arranged for him to represent not only Switzerland, but all of Europe. And we asked the Swiss expert to liaise closely with the other Europeans in Washington. On another point, we decided, "Don't speak up too fast; let's begin by exchanging our information." The English had a permanent

representative in Washington, and they agreed to place him at the disposal of the European initiative and to send another expert. The Germans wanted to send somebody, but there was a transportation problem. So they asked Lufthansa to charter a little twin-jet plane - it picked up the specialist out in the boondocks, flew him to Roissy Airport in Paris, and pulled up alongside the Concorde, which delayed take-off by one minute (a real event). You can just picture it: the Concorde doesn't take off, the passengers become intrigued, and suddenly they see this tall, blond guy with an athletic build jump out of a tiny plane nearby clutching his little brief case, scramble into the Concorde, and woosh! The door closes and the Concorde takes off. Laurent and his colleague reached Washington the same evening, and they could share their thoughts during the flight.

L. DU BOULLAY: We could see our representative at the Embassy that very evening, since we have a permanent specialized delegate in the United States.

CL. FRANTZEN: The time difference is handy in those cases. We were certainly a lot faster than anyone else in the world network. This first contact gave us much more specific information about the situation. The next day, we saw the FAA, where they told us in great detail how those ten difficult days had unfolded. They explained how, given the state of affairs, they had made the only decision that was open to them - and I agreed with their analysis. It had become impossible for them to take any other approach, even though they knew that technically, it was the wrong choice. What's more, the Swiss who went to Long Beach confirmed this opinion - there were no technical elements that we hadn't received, and nothing that could justify the flight ban.

P.L.: So these coordinated trips to the United States served to clear away one doubt: there was no clear technical issue demanding a flash decision.

CL. FRANTZEN: All the Europeans came back with a cast-iron certitude: if the part in question didn't show any signs of weakness on other DC-10s, we could fly those planes without any problem. We simply had to repeat a series of inspections, if we didn't fully trust those that had already taken place. Then, if the part was sane, we could give the green light. This meant there was a clear opposition between the American system and the European one. On their side of the ocean, they were saying, "We're grounding these planes, and we don't know how or when we'll get them flying again." On our side, we could see quite clearly how, and even when we could start flying again.

L. DU BOULLAY: This stance was adopted within a few days - I'd say around June 8 - when the experts got back. Technically, there was no doubt: if we wanted greater guarantees of safety, all we had to do was run three checks instead of just one. I should also note that the investigation had made progress. The Americans had discovered that the plane that crashed, and the planes that revealed cracks, had all undergone a specific type of maintenance that hadn't been foreseen, and whose effects hadn't been taken into account, when the plane was designed. Very roughly speaking, this had entailed tapping with a hammer on a spot that wasn't meant to be treated that way. But the

specialists hadn't succeeded in getting this message heard by the legal system. However, at last there was the outline of an explanation: it was a maintenance problem. That's what made it possible for Europe to build a completely unanimous position.

P.L.: One difficult questioned remained: vis-à-vis the media, how to get the planes flying again? How did you handle that?

CL. FRANTZEN: That marked the beginning of a new phase, the process of beginning to fly again. We benefited from several favorable circumstances, by which I mean European-level meetings that had already been scheduled. On June 12, the directors general of civil aviation were to meet in Strasbourg for the general assembly of the European Civil Aviation Conference, which is a sort of club for directors general of civil aviation authorities. They were all there, and they could back each other up, provided that we technicians could get them to talk about the matter.

L. DU BOULLAY: The problem was, we were faced with an unknown scenario: how not to follow the decision made by a manufacturing country.

CL. FRANTZEN: On what legal grounds could our action be founded?

L. DU BOULLAY: We worked a lot on that point, in each country. We could sense that we had to find a mechanism for making a group decision.

CL. FRANTZEN: In legal terms, the French situation was pretty simple, because our system is actually fairly well organized. It gives us full autonomy in decision-making. Intellectually and legally, our approach always starts with the results from the original manufacturing country, but it also allows for incorporating variations. This means we can say, "I'll do more than them, I'll do less, I'll do things differently." If we push it to the limit, this even lets us decide to fly anyway, but under such-and-such conditions. So legally, we had full powers to start flying the planes again. In contrast, it was unfortunately written into the regulations governing some of our European colleagues - I'm thinking of the Swedes, if memory serves - that for an imported plane, all they could do was validate a foreign type certificate. Since there was no more American type certificate, they were grounded. So they had to build an incredibly contorted legal argument: they looked closely at the regulation and saw that nowhere did it state that this certificate had to come from the manufacturing country. So they decided to validate a French type certificate. This wasn't the only example.

L. DU BOULLAY: In other words, things moved very far very fast for everyone as a whole.

CL. FRANTZEN: The problem was getting all these steps into sync. The European decision had to be adopted on the same day, at the same time, on the basis of the same inspections, which had been repeated unanimously by all our airlines. The European planes began flying again on June 19. As soon as word of the European action began to get around, it raised tremendous interest all over the world. The very same day, there was a meeting at Charles de Gaulle airport to explain our position to a number of third countries which were starting to say that maybe the Europeans were right after all. The first to arrive were the Japanese, who were slightly perplexed by the disarray of the

Americans. They who usually only swear by the Americans, were beginning to have doubts. Next came the Australians -

L. DU BOULLAY: - the Thais, the Brazilians... There were at least twenty countries who came to that meeting to ask, "How did you do it? What are you doing?"

CL. FRANTZEN: We explained on what basis we'd put the planes back in flight. And they chose to follow the European decision.

L. DU BOULLAY: You can see that this European hub, where people could see common positions being organized, based on coordinated technical measures, made a real impression. We received numerous phone calls, from airlines, from foreign authorities.

CL. FRANTZEN: They felt stranded. When you're Japanese and you see the Americans fumbling about, you feel like an orphan. When you're Australian, you always feel like an orphan, and even more so in such a case. The same goes for the Brazilians and the rest. And then you perk up your ears: "Hey, Europe seems to be doing something consistent, it's holding together - let's go see the Europeans." I have to say that we devoted a lot of time to this international aspect of crisis management.

L. DU BOULLAY: On top of that came the issue of the right to fly over the United States. It had just grounded its own DC-10s, and it didn't want foreign DC-10s landing in the country.

CL. FRANTZEN: That opened a serious ancillary legal crisis. We were maintaining that our planes were totally under our sovereignty and that by virtue of a number of international agreements, we could go where we wanted to - including the United States. But you can see what kind of public relations problem that perspective causes. Imagine a DC-10 from the Dutch carrier KLM landing in Chicago, while the whole American DC-10 fleet is grounded. You can also gauge how unpleasant that is for the American airline system, hemmed in by environmentalists, legal experts, a judge in Washington, and the FAA, and watching its competitors take advantage of the situation.

Then one Sunday morning, an American delegation appeared in a Paris hotel to explain to us that maybe our planes could fly in Europe, in the Pacific basin, or in Africa, but that the least little flight plan towards the United States would trigger a major diplomatic crisis between our countries - at the highest level. They had actually decreed this prohibition on flying over their territory at the same time they decided to withdraw the type certificate.

L. DU BOULLAY: Legally speaking, a highly debatable prohibition.

P.L.: What did you do?

CL. FRANTZEN: France was hardly concerned, since the French airline UTA had just one route that was implicated (Tahiti via Los Angeles). All they had to do was use a different aircraft. We didn't want to appear provocative. Actually, nobody violated the ban. Some airlines, like British Caledonian and Laker, took their cases to court, and they eventually won - ten years later, on

the grounds that the American administration didn't have the authority to prohibit their flights.

L. DU BOULLAY: France very quickly found itself at the heart of a worldwide communication network: we had lots of requests pouring in from abroad, from organizations confused by the American stance. Our replies were along two lines. The first was clear and firm: "We're going to begin flying again, and that's a unanimous European position - here are the measures we've taken in consequence." The second was more nuanced: "The Americans are having problems, we have to understand them." The point was to pour oil on the waters. As far as flying over the United States was concerned, with the exception of a diplomatic delegation from the European Civil Aviation Conference, we didn't try to take any collective European action to force the United States to yield. The Conference reminded them of the conventions in force.

CL. FRANTZEN: This subsidiary crisis on flying over the United States immediately alerted us to another potentially slippery slope: that this kind of prohibition would spread all over the world. So as soon as we had begun flying the planes again - all European planes, at 11.00 am on June 19, following the prescribed inspections - we thought it would be prudent to warn the States being flown over, just to avoid trouble. It seemed understandable that people might get worried when they received a flight plan announcing that a DC-10 was to fly over or make a technical stop in their country - an American-made plane that had been grounded by the Americans. Someone who'd been reading the papers just might decide to take measures that could create trouble for us. So one Thursday, we brought all our communications capacities into play.

I should acknowledge here the quality of our contacts with our Ministry of Foreign Affairs, on the Quai d'Orsay. We had absolutely no problem in getting across the message that the countries being flown over had to be informed. Even though that involved forewarning about a hundred countries, as UTA has a very extensive network. And that's something the other European countries didn't do. We were the only ones who had such good relations with our foreign affairs department. At any moment, I can call someone at Quai d'Orsay and set an operation like that in motion. That's how it was that Thursday, when our ambassadors in several dozen countries received instructions to go see the appropriate authorities and explain to them why and how we were going to fly over their country. This was carried out on Friday (Saturday in the Islamic countries). By Sunday, mission accomplished - we had responses back from all the embassies. And there were some extraordinary ones, like I forget which emir who replied to our ambassador, "Sir, may I congratulate you, this is the first time that a country flying over us has had the elegance to tell us why and how it is doing so." Moral of the story, our planes got through without a hitch. Now we were wary of the reactions from the United States, which was completely entangled in its own apron strings. To justify its own position, it could very well have tried to block everything everywhere. But we didn't wait for its ambassadors

to go to these countries. We sent ours, without waiting, to say, "Ladies and gentlemen, here is the situation, we wanted to forewarn you." As a result, it was too late for the Americans.

I would like to go back to one important episode in the central crisis that taught us a lot - after all, it had to do with how we got our DC-10s flying again. This happened in Strasbourg. The press had learned that Europe was going to move on its own, and it knew that the directors general were meeting in Strasbourg. I'll never forget when our bus arrived in front of the hotel, with all the technical agents, who had met up at the airport. What a shock! On the steps all the major radio and television stations were waiting for us. We had the bus park a little further away, and we got out one at a time, so as not to look like a group. We passed through the press crews discreetly. The first trap had been defused. Once inside, we met in one room and harmonized our positions before going off to the convention center where the directors general were meeting.

And that's where we had a moment of panic. You have to know that the German system has two branches: there's the ministry on one side and the technical administration on the other. My German counterpart said to me that his colleague from the ministerial side was wavering, and moving towards a position like, "If the United States does that, we can't diverge from the United States." What a panic. Because if just one person went soft on us, our unanimity - our strong point in facing the press and the politicians - would go down the pipes.

So I bluffed. The director general of Lufthansa, whom I did not know, was at that meeting. I had him brought out of the session, and I said, "If you want to fly your planes, you've got to call Bonn right away, and talk directly to the minister. There are rumblings on your ministerial side." He ran off to telephone Bonn. That way we short-circuited all the super-prudent and timorous bureaucrats in the ministry. And so we saved the match as far as Germany was concerned. Since then, we've become great friends of the boss of Lufthansa.

That for me was the most difficult moment in the crisis: when I felt the Germans slipping. I had the good luck to have a room nearby, at twenty paces, with the person I needed to go around a potential roadblock and break it up.

P.L.: You didn't have any media crises of the type, "As usual, the Americans are looking after safety while the Europeans are looking after their own interests, and that's irresponsible"?

CL. FRANTZEN: NO, we had good press. That wasn't a handicap. Not because we'd fed the journalists any special information. I think they were struck by the very unity of the Europeans. The press trusted the technical agents - something it often doesn't do. There wasn't just one specialist in a corner making reassuring noises. I only remember a few vague moments

when people asked us if we weren't being held a little tightly in the palms of the airlines, or acting just to please the them. So we provided explanations.

L. DU BOULLAY: Besides, we could say, "When the planes have to be grounded, we ground them." When it's the truth, and it was, people buy it.

P.L.: There wasn't any internal sniping along the lines of "Look, Swissair is more careful of safety than UTA," or vice versa?

L. DU BOULLAY: No, all the airlines were united across the board.

CL. FRANTZEN: Nobody played that game, and nobody could have played it. To take your example, Swissair and UTA could only restart flights together, because in any case, Swissair manages maintenance for all of UTA's DC-10s. That's one more proof of how intertwined our systems are: within the groups of airlines we mentioned earlier (e.g. KSSU, Atlas), for each type of aircraft, one company manages all maintenance for all the group members.

As far as the general momentum of our action, I want to emphasize that the technical evaluation underlying our conviction was never founded on anything besides the observations of our American colleagues. It was reinforced by all the direct contacts the manufacturer had with the actors involved. The difference is that politically, legally, and with the press, the United States and Europe were playing two different ballgames. In the United States, there was a logjam. Here in Europe, we began by following the Americans - we suspended all flights, we checked, but we didn't create a logjam. We were simply taking preventive measures. There was no logjam with the press, public opinion, or the law. And as soon as our technical conviction was set, we could move immediately to get the system operating again. Whereas on the other side of the Atlantic, they had to untangle the whole mess, make the temperature drop. That took a full month, because the American aviation administration didn't lift its flight ban until July 13.

## *The Airbus Crisis-within-a-Crisis*

P.L.: It isn't at all rare in a crisis to see the major issue produce offshoots that bloom into secondary crises. You had the question of flying over countries other than the United States. And you've also indicated that there was a red alert about Airbus.

CL. FRANTZEN: It started two or three days after the accident, before the DC-10s had been grounded - on May 29, if I'm not mistaken, when the FAA prescribed a second round of inspections on the DC-10s, to be performed before any further flights. That immobilized the fleet for a few dozen hours.

L. DU BOULLAY: It was 8.00 pm, I had gone to a dinner in the city. I got a call saying, "There's a problem with Airbus."

CL. FRANTZEN: You have to back up a couple of hours, because that's the good part. I was with our director general, reviewing the DC-10 crisis. We're good buddies, and he said, "Hey, Claude, if ever an Airbus crashes and a crisis sets in France the way it has in the United States, we'll be totally overwhelmed. You've got to think about the matter." And he added something like, "Get back to me in three months."

After all, we hoped we'd have some time. "You've really got to frame up a proposal on how we should be organized. We've got no crisis room, our offices are spread across Paris, we have to define the roles everyone will play. In the present case, we're behind the front line, and we only have a few aircraft involved. But what if it happened here?" We parted company, at about 7.00 pm. I took the metro. At home, my daughter said to me, "The Vice-President of flight tests at Airbus just called from Toulouse [headquarters of Airbus]." What was going on? I called back. "You know that They (the Americans) have grounded Airbus?" I was speechless. I'd been told we had to prepare for a crisis one day, but I'd been given three months to think about it. Thirty-five minutes later, bang! the crisis was there.

L. DU BOULLAY: The director general of civil aviation was still in his office, where he'd gotten the news. Immediately, he tried to gather together his troops. His feeling was, "That's completely off the wall, we've got to see about this fast." He was able to reach us.

CL. FRANTZEN: "The Americans have grounded Airbus." It quickly became apparent that they wanted to extend to Airbus the measures they were proposing for the DC-10, i.e. simply a reinforced inspection, but to be carried out immediately, which would immobilize the fleet.

L. DU BOULLAY: The basic argument was, since Airbus had "the same engine," we had to apply the same measures.

CL. FRANTZEN: Right away we could flair the mistake. The specific part that had been incriminated in the Chicago DC-10 was not the engine itself, but the pylon that connected the engine to the wing. This pylon was completely different on Airbus. We could see where the confusion came from. But we thought, "It would be too stupid to confuse the two. Maybe there's something else, some new technical elements. Maybe the rupture actually was due to an engine failure" (like a projection or vibration). So our first concern was to get information, to get the network moving. Actually, we were very lucky. I think it took all of an hour or two to bring together, in Toulouse, all the technically competent people for the part in question, the pylon, along with the people in charge of certification. And there were four of us from the government side of things, including a director general who was starting to have a lot of experience.

CL. FRANTZEN: Very rapidly, we got confirmation that the part that was apparently implicated in the Chicago accident was completely different on Airbus. We got ahold of the Airbus technical documentation exceedingly quickly, thanks to an intense effort in Toulouse and to the quality of the people involved. Simultaneously, we were also trying to get in touch with Washington to know what they were up to (it was still a decent hour there, since it was about 9.00 pm in France). We also tried to reach the FAA's representative in Paris.

That's when the media aspect of the business cropped up. No one knows why, but at that moment, the transportation minister's cabinet decided to hold

a press conference - probably as a panic reaction, because people were talking about Airbus. Our director general had to put in an appearance, while we kept on scavenging for information. Soon after, I went to join him, leaving Laurent to try to reach Eastern Airlines, the only American operator flying Airbus aircraft. By a stroke of luck, he managed to reach Eastern's chairman.

L. DU BOULLAY: I began by reassuring him that we were following the matter closely. His answer was, "I'm going to fly my Airbuses. The FAA head is a (and there was heavy static on the line) and I just called him to tell him off something terrible." On that note, I promised him that he could reach us at any moment if he needed anything, and I left him several phone numbers.

CL. FRANTZEN: Via several conversations with the United States, we managed to learn that the situation wasn't exactly what we'd been told it was. The legal and administrative formalities for suspending Airbus flights had been cut short. And then we began to see how the crisis had been able to develop. It all started during a press conference dealing with DC-10s:

*A journalist:* Excuse me, sir, but doesn't Airbus have the same engines?

*FAA spokesman* (who wasn't sure and had to ask one of his colleagues): Yes, Airbus uses the same engines.

*Journalist:* Then what are you going to do?

*Spokesman:* Apply the same measures to Airbus as to the DC-10s.

And the press went off with that information. The legal request didn't take shape right away, because the American experts thought it was stupid: they knew full well that the two airplanes were different in terms of how the engines were installed. But the press was off and running, and that was the information it gave out.

L. DU BOULLAY: And things moved fast - special bulletins on the radio and on TV. That kind of information can go straight to the American air traffic control towers. On the sole basis of TV news, a controller in an airport ordered an Eastern Airlines Airbus that was taxiing down the runway to go back to the gate.

CL. FRANTZEN: That's how the snowball gets rolling: a flash decision by the boss of American civil aviation, based on a completely erroneous judgment made during a press conference. You suddenly find yourself with your planes grounded, even though there is no technical justification and no legal proceedings, since within the regulations, nothing has been done yet. The chairman of Eastern decided to carry on business as usual.

In the meantime, that half-cocked press conference was being organized. I'll never forget arriving at the Ministry of Transportation. In the press room were all the presidents of the major airlines, the president of Aérospatiale, the president of Airbus Industrie, the president of SNECMA (the engine manufacturers), the presidents of Air France and UTA - and hordes of journalists. And all these fine folk were talking, though I don't know what about, since they had no facts. The minister himself was there. He'd launched this sort of press conference as a reaction to the American press conference and to a statement that he didn't even know was false, hi fact, he didn't know

anything. We'd tried to hook up with this initiative, and our director general said, "Good! If you're giving a press conference, I'll come."

I can still picture Laurent bursting into the room, at the back of the crowd, calling, "Hey! Hey!" and trying to interrupt whoever was talking then, to say, "I've spoken with the chairman of Eastern. He's maintaining his flights. The whole story is false, there's nothing in it."

By midnight, we were all at home in bed - after the FAA representative in Paris had officially apologized! But for four hours, we were deep inside a madhouse.

L. DU BOULLAY: You have to admit we were pretty lucky. We got together the competent people really fast, in Paris, Toulouse, and Washington, and we managed to reach all the necessary contacts. We got ahold of Eastern's boss, whom we knew well. We could nail down the information from the FAA technicians, who quickly recognized that there was a mistake. But for a moment there, things had been slipping out of control fast.

P.L.: Could we now take a little distance from this case, and bear in mind my key questions: what were the most difficult moments, what lessons did you learn from the experience?

CL. FRANTZEN: If you want, I'll try to answer your questions, and then I'll tell you how we saw this crisis.

1. What was the hardest day? For me there were two. In the main crisis, as I said, it was the episode in Strasbourg, when the representative from the German ministry was backing out on us. We held all the strings, we had a consistent system in Europe, and all of a sudden an attitude crops up that could blow away everything we'd been building for several days, with a considerable investment of time and energy. For instance, Laurent had made a round trip to Washington in 48 hours and hadn't slept for who knows how long. The second episode was the arrival at the Ministry of Transportation for the Airbus pseudo-crisis. The problem in that case was our political and press mechanisms starting on a hair trigger. We might not have been able to stop the machine.

2. What is the system's weakest part in times of crisis? First of all, the lack of psychological preparation, at all levels. Let me insist on the word "psychological." Because I don't place much stock in well-kept case files, since each crisis is different. But nobody is psychologically ready to face a crisis like that. You have to distinguish between two categories of players: the technicians and the politicians. We technicians try to build as strong a technical base as possible, but we are extremely discreet in dealing with the world of politics, the law, and the press. We technicians know we're never perfectly prepared. But the politicians think they're prepared. They tend to imagine that because they've won a few skirmishes, they'll be able to handle a major crisis. In the case we've been discussing, we had the great fortune to have a director general who was particularly well prepared. He'd already

weathered comparable crises in the same field. He knew the ropes, we were good friends, and our relations with foreign authorities were very solid.

Second, the political circles generally haven't had occasion to live through a comparable situation and to work with their own departments that handle this type of question every day (though not on the same scale).

Of course they know in a general way what departments exist, but they haven't seen how they work on a daily basis. So in political circles, a crisis is managed as a completely exceptional event, when in fact it is only exceptional by its scale and its impact, but not by its fundamental components.

A specialist will try to plug the crisis into the pre-existing architecture of relations and methods that have proven efficient in previous, more modest but infinitely more numerous cases.

Let me give one example. Following the accident with the Japan Airlines 747 in 1985, it was somewhat unpleasant to observe that our information on the American authority's reactions was being channelled through the Dutch authority. But this was because on the technical level, we had organized a process that protected Washington from being inundated with questions to which it was ill-equipped to respond. We had divided that task among Europeans.

To some extent, this pre-established process deprives us of a certain amount of freedom in managing the crisis, the freedom to call Washington directly. But its efficiency has already been tested.

One last worry I have comes from my awareness of how little our political levels here know about what goes on in the United States. Our political levels know perfectly well how the French press and public opinion will react - they deal with them every day. However, they are by definition much less familiar with the American system. And since our crises are almost always international, and the American system always plays a determining role, well, I'm worried. It even goes beyond the political world. I've seen major French corporations fumbling about during various crises with the American press, public opinion, and legal system.

In terms of the moorings for the system, I would note the trust that our politicians generally place in technical experts in the field of aeronautic safety. When the situation becomes complex, they don't try to formulate their own technical opinions - which is very unlike the attitude taken in fields that everyone imagines are easy to understand.

L. DU BOULLAY: Which is the case with powered ultra light aircraft, for example.

CL. FRANTZEN: Right, everyone thinks they understand everything there. In contrast, for major aviation, politicians don't hesitate to rely on technicians. And in the DC-10 crisis, the technicians' system impressed the managers. Seeing all the experts from European countries converge, each bringing his own background, his own economic interests - that gave us a lot of credibility. Having a very solid pre-existing network of personal connections both in Europe and with our American colleagues was simply

priceless. I have to insist on the quality of the very strong interpersonal relations that exist in the aeronautic system.

L. DU BOULLAY: To cite an example, I can tell you that the American bureaucrat who was on the front line in the decision to ground the DC-10s, still had fresh in the mind the dazzling memory of an impromptu trip I had arranged in the Loire valley for him and his wife during their European tour a few years earlier. And I can assure you that during my lightning trip to Washington during the DC-10 crisis, we were able to talk on several levels about the decision to ground the planes.

CL. FRANTZEN: I call all my counterparts in the major aviation countries by their first names. At any moment, I can pick up the phone and call any of them, personally, at home. That's terribly important. As is our capacity for communications logistics. Along the same lines, look at how Aérospatiale was able to round up all the specialists for a part being discussed in the United States, in less than an hour, and outside normal working hours - and have access to the corresponding drawings.

There is also a certain mechanical network: our aviation Teletype network is technically just as fast as that of Agence France Presse, our national wire service.

We also have bonds of trust with our ministry of foreign affairs. They know that we can alert them justifiably if we think that a matter may be taking a significant political or diplomatic turn.

L. DU BOULLAY: You should note that our field of activity is very special. It operates at all times, all over the planet. So we have practice in communications and methods, in every sense of the term.

CL. FRANTZEN: I'd like to mention one other point on the subject of crisis management. When you're pulling all the strings pretty much the way you want to, getting a whole network moving, mobilizing a huge number of ambassadors in the wee hours - it goes to your head. But you mustn't get caught up in the headiness of the action. Military specialists know all about this. For some people, the heat of the battle goes to their heads, and they end up doing something stupid, like jumping out of the trenches at the wrong moment. I think this is true everywhere, and it's wise to seek constantly to get some distance from your actions under those circumstances. I'm a little wary of myself in those cases.

There's also one person whom we should know better: the judge. Players are sometimes afraid of the judge's role after an event, or of an action like a restraining order.

P.L.: You spoke earlier of other crises, saying that it wasn't always easy to get all the information you needed. But isn't the issue more one of knowing how to guide highly complex systems through information-poor situations, as developments come crowding in on all sides?

CL. FRANTZEN: One lesson across the board is, the way you manage a crisis is intensely tied up in what you've done before the crisis, in terms of

studying and certifying the equipment and the procedures. We have the equivalent of 200 full-time experts and technicians looking after aircraft safety in France, not to mention the air traffic controllers. At the top of the chain, we certify equipment, we survey maintenance, we examine what airlines are doing, we oversee how workshops are organized. So even when there is no crisis, there is a pre-existing information network, which of course has its imperfections, but when the crisis hits, we can work from it to plan and to try to link the crisis with the pre-existing scenario. With that kind of base to stand on, we can hone in on whatever sector seems most heavily implicated in the problem. If we had to start from scratch, as seems to be the case for certain technological hazards, it would be a different problem! That's when you see officials start creating committees during a catastrophe - it's all hot air. They've got nothing to stand on.

And our system holds up to international comparison: the same intellectual guidelines, the same approaches.

L. DU BOULLAY: And it's like a living organism. Our system is never cut off from the outside.

CL. FRANTZEN: What's more, we're constantly training on mini-crises that are happening all the time. The architecture is being tested every day. We see hundreds of regulations every year involving machine inspections. That's more than one per working day. So we have living concepts and experience that we can really fall back on when a super-crisis arises.

P.L.: What do you do when you don't know what to do?

L. DU BOULLAY: When you don't know? You always know something. For example, you know accidents are due to a combination of multiple factors, and that it's almost impossible for the same combination to occur twice in a short period. Which means you can keep on flying.

CL. FRANTZEN: The level of safety aimed at in design and verified during the certification process is very high. If the margin grows or shrinks a little, it doesn't throw us back to the dawn of aviation, or even to the level of other common risks in everyday life.

P.L.: So what do you decide: "I'll take a month to study the matter," or "I can't stop these planes, because the impact would be too great?"

L. DU BOULLAY: Once the first facts, then the first analyses, become available (in a matter of hours, days, or weeks after the incident), we can evaluate whether the level of safety has been altered. One of the keys to the quality of this evaluation is that we work constantly on these incidents.

CL. FRANTZEN: Roughly speaking, I can say, "We're at the level of safety, design, and precautions that air transportation had five or ten years ago - that's not so bad." But if it falls to what it was forty years ago, that's no good. If ever the technical branch has a creative dry spell and we can't offer any corrective measures, I would report to the political level, with a recommendation that they lean in favor of safety. We'd stop flying, as we've done at least once in France, about twenty years ago.

P.L.: But there you're in a touchy situation. On the one hand, if you stop the flights, you'll get blamed for bringing an economic system to its knees.

But if you don't stop, the press will accuse you of irresponsibility, saying, "As usual, the techno structure is making kamikazes of us."

CL. FRANTZEN: Things usually go well, and there are two reasons why. For one, the airlines tend to trust us, and they even accept the principle of grounding planes. I can assure you that if by misfortune in the next few days we had to ground the Mercures or the Airbuses flown by Air France or Air Inter, those French airlines would grumble a bit, but the case wouldn't end up in court. They won't go to the minister and say, "Who are these nuts at the DGAC, Mr Minister, don't listen to them." Certainly not! We know each other well enough. And second, the other side of the coin is if we don't decide to ground the planes, the specialized professional journals won't cut us down or denounce the scandal. But of course there are newspapers with a greater appetite for scandal-mongering.

L. DU BOULLAY: This trust isn't blind.

CL. FRANTZEN: And it can include questioning personal responsibility, since one of my co-workers was indicted as a result of an airplane accident. All it took was one sentence in a declaration made to the legal investigators, reread in a certain light. In the end the charges were withdrawn.

The fact remains that the system is vulnerable. Suppose that (for reasons I can't imagine today) a pressure group wanted to undermine the system's credibility. It would choose one borderline case. It would do all its homework. It would play up the case artfully. We might find ourselves forced to take measures that we considered useless, but that would become unavoidable because of public pressure. Now there are a lot of technical measures that seem to contribute to safety, but actually, especially in the long run, they tend on the contrary to generate risks. I don't even know what to say about the abuse of legal procedure in the United States. It leads to the suppression of information, and the fear seems justifiable that one day it will turn on us - when the most vital things for safety are openness, communication, and information.

GILBERT CARRÈRE

# Askarel Leaks in Villeurbanne

June-July, 1986

# The Port Edouard-Herriot Conflagration

June, 1987

## Background

For this interview we met with Gilbert Carrère, prefect of the Rhône-Alpes region (near Lyons, France) to discuss the lessons he learned from two recent incidents.

Villeurbanne: On Sunday, June 29, 1986 at 11.27 am, a short circuit triggered a fire in an electricity substation in Villeurbanne, a suburb of Lyons. Firemen brought the blaze under control within thirty minutes, but it provoked a liquid askarel leak, and some of this compound was broken down by the heat. This caused so-called "hot" pollution, which can result in the formation of toxic by-products including PCBs. As a result, laboratory analyses seemed indicated, and samples were taken. The unit was slated to be cleaned the next morning.

On Monday, June 30, at 5.20 pm. a slip-up at a transformer unit set off a second fire, larger than the one the day before. It generated large quantities of smoke, forcing the preventive evacuation of the neighboring inhabitants. By the end of the evening, the fire was under control, and residents were allowed to return home. Free medical examinations were offered to those who had been in the area of the accident, and almost 500 people were examined. The occupants of five buildings located within the evacuation area were temporarily rehoused in a hotel.

The biggest problem surfaced on Wednesday, July 2. Whereas everyone thought - and Electricité de France (EDF) had clearly announced - that the liquid contained in the unit could not contaminate the soil layer because of the presence of a leak-proof concrete containment structure, it was found that the 300 liters of askarel, mixed with 30 cubic meters of water and foam used by the firefighters, had simply vanished. The liquid endangered the water table, which lay 13 meters below.

All the ingredients for a touchy problem, if not a crisis, were present. There were doubts about the dangers, long and complicated analyses, botched communications due to assurances that the unit's containment basin was leak-proof, worries about the water table, and more. The prefecture (the district-level government) took charge of the case.

Port Edouard-Herriot, Lyons: At 1.18 pm on Tuesday, June 2, 1987 a violent explosion rocked the Shell petroleum depot here. Public authorities and emergency services were averted. An operational command post was set up not far from the site of the accident, with another, stationary post at the prefecture, by 2.30 pm. The specific action plan was put into effect at 2:45, and the firefighters attempted a first foaming operation at 5.25 pm. At 6.32, one of the reservoirs exploded, and the fire units had to fall back. During the night, a second foaming operation was prepared, with heavy equipment, while the flames spread to two more reservoirs. The foaming operation was begun at 6.35 am, and it was successful. Fourteen reservoirs had burned or exploded. In human terms, the fire had claimed two lives in the first explosion, and sent 29 wounded, including 23 firemen, to the hospital. Some 10,000 cubic meters of petroleum were destroyed. The conflagration did not have any serious environmental consequences, and weather conditions fortunately remained highly favorable throughout the incident

P.L.: Villeurbanne and Port Edouard-Herriot: in each of these cases, how were you drawn into the event?

G. CARRERE: In very different ways. At Villeurbanne, the surprise was total. I was even out of town when the accident occurred, and Mr. Doublet, my cabinet director, ran the first crisis meeting. In the case of Port Edouard-Herriot, I arrived on-site two hours after the incident began, preceded by the deputy prefect responsible for police forces, who had taken the preliminary measures (having the police seal off the area, setting up the command post, and so on). It so happened that a few days earlier, I had signed the specific action plan for the complex we call Port Edouard-Herriot. So in the first case, the event took us totally by surprise - we felt like it was big and hard to get a grip on. While in the second, because of the very existence of this internal protection plan, I felt at the start that we were on familiar terrain. That may explain why I failed to realize the enormous scale of the event, at least at first.

In both cases, there was no lack of surprises.

P.L.: More specifically, in each episode, how did you go through the phase that followed immediately - in which you began to grapple with the event?

G. CARRERE: That's the decisive period. Here again, there was a difference. The experience at Villeurbanne had borne its fruits, and at Port Edouard-Herriot, the core operations staff was already organized, and three or four basic units were at work already when I arrived. The framework was already instilled in the minds of my co-workers. But you always have to be on the watch for improvements you can make. The location of the operations command post wasn't very good. Since then, we've scouted out ten or fifteen potential sites for our command posts throughout the "chemical corridor" along the Rhône Valley. The criteria used include available resources for helicopter landing, telephone liaisons, radio communications, and so on. That much said, the mechanism itself, the structure fell into place naturally.

We were in what looked like a doubly conventional situation. There was a specific action plan for this installation - even if it gave us a certain false

assurance, at least it existed. And this was a fire, which meant we knew we had the means to fight it (those of the city of Lyons), and we believed these were sufficient. There shouldn't have been any surprises, but there were.

In the case of Villeurbanne, things were handled much more empirically and, at the beginning, somewhat indiscriminately. First, without knowing it, we were in the scenario of the transformer in Rheims. I didn't know about that case at the time, and I'm sorry I didn't - on that point, an information system could be created. The operator, EDF as it happened, thought it could handle things alone, and the problem got away from it. At Rheims, I don't know how long it took for that to happen. At Villeurbanne, that's where we were after 48 hours. The business got away from EDF because it was such a big media story. Now this isn't to criticize EDF, that's the way things happen, because we really didn't know what should be done.

P.L.: One case was hard to get a handle on, the other was a classic.

G. CARRERE: Yes, but after this initial difference, we run into a scenario that's pretty much the same - while keeping both events in proportion.

The first point in common was the great difficulty in collecting data, which led to problems in taking action. At Villeurbanne we knew precious little at the outset. At Edouard-Herriot, that's about what happened, but for other reasons - because certain port officials, especially those of one oil company, couldn't be reached immediately. And because we found, or thought we'd found a series of railway cars carrying acetylene. Since we had a plan, there should have been a very precise inventory of the hazards, but the cars' presence proved to be false, which is harder to justify.

Luckily, we adopted a low profile, that is, we didn't try to recover or remove the cars neglected by the plan, which would have entailed seriously risking human lives. That was a problem of uncertainty that could have opened up some potentially very dangerous hazards or dangerous and pointless interventions. Of course that's the rule with the railway cars: you mustn't be surprised if one day they're there and the next day they aren't. But that doesn't change the fact that from the start, a faulty first analysis handicapped our action severely. This insufficient first analysis also caused another problem: it probably made us lose several hours in the decisive intervention, which took place at six the next morning. We could no doubt have moved as early as 11.00 pm.

However, except for this last point, I would note that the regional direction for industry and research (DRIR) already had very good knowledge of what chemical products were there, in terms of both types and quantities. There, we saw to its full extent the usefulness of preparing and planning for the fight against risk.

The second point in common was a heavy press presence and an outpouring of questions from journalists. This was even more noticeable in the case of Edouard-Herriot, for circumstantial reasons. The trial of Klaus Barbie, the Butcher of Lyons, was going on at the same time. But because he

refused to go to the hearings, the members of the press were left empty-handed. We inherited all the journalists from outside the region, who were particularly demanding and not well informed on the issues (despite the explanations we offered, for example, they rather hastily compared this fire to another that took place in the region in 1966, claiming 20 lives).

The major difference between Villeurbanne and Port Edouard-Herriot is that in one case, things were spread out over a month, and in the other, over 36 hours.

P.L.: That must surely create different sets of problems.

G. CARRERE: Definitely, but the approaches used aren't that far apart, and to understand a situation, they depend largely on the capacity and the quality of that memory device called a plan.

P.L.: What were the hardest moments?

G. CARRERE: The touchiest in the Villeurbanne matter was the progressive penetration of the askarel through the different ground layers and down to the water table. The first tough moment came when we realized it was impossible to isolate the askarel flow. With hindsight, we saw that we had mistakenly attributed it a greater flow rate than it had. We didn't know that geologically, the containment basin had fulfilled part of its function - it had retained the mixture longer than we thought. But at the time, as soon as it looked like the water table could be hit, this raised the question of whether the drinking water supply for the Lyons urban area was in danger.

The second difficulty was letting the small number of residents who had been evacuated return to their homes. When should they be allowed back? This raised the problem of knowing exactly what the risk was and how to decontaminate. And there were no clear-cut rules about cleaning. We used a firehose with different techniques, but we were operating in unknown territory. The risk threatened only a small group of people, but it could be a direct one.

In the Port Edouard-Herriot fire, what I thought to be the toughest moment was when we estimated that the explosions were going to jump from one reservoir to another and reach that set of railcars that we thought contained acetylene, or perhaps the storage areas of another chemical company where highly toxic materials where housed. It was dangerous to expose our men in those conditions, and all we could count on to avoid big trouble was the weather.

P.L.: This is one of the key questions in crisis management: how do you steer your way through all these "black holes" where no one really knows what should and should not be done?

G. CARRERE: That's where you mustn't give in to immediate pressures, even from the operations technicians. I wonder to what degree - and I'm choosing my words carefully, because I myself might actually have been responsible for this kind of problem - by making decisions a little hastily, we might not have exposed our men to dangers that were avoidable.

P.L.: What do you do then in terms of information? At Villeurbanne, it was widely remarked that you brought in experts to speak at press conferences. That was an innovation.

G. CARRERE: I don't know. The truth is, I was afraid of seeming lightweight in my explanations and giving the impression that the people who had to decide didn't really know what to decide. That really wasn't the case - I think we pretty much knew what to do. But it's sometimes difficult to explain what you want to do, why you've decided not to act immediately, and also why you're falling behind schedule. At Villeurbanne the drilling took longer than expected. That's where experts are important - provided you don't take away their margin for independent judgment. Because for one, it's difficult to master a technical subject sufficiently - and you run the risk of making a mistake that costs you your credibility. And on the other hand, there's always the risk that you will be only partially successful. In short, it's better to put people directly in contact. And I think that went pretty well.

P.L.: And with elected officials?

G. CARRERE: LI this type of situation, there is always a problem with the relationship between elected and appointed officials. At Villeurbanne, things went very well. First of all, because there was really only one township involved. And second, because its mayor, Charles Hernu, took part regularly in the daily meetings of the commission for coordination and vigilance. I even wonder if it wasn't Mr. Hernu (also a former journalist) who had the idea of giving the name "commission for coordination and vigilance" to the informal working group that sprang up the day after the fire. It started with technical bureaucrats (from DRIR and the direction for infrastructure and the environment). It grew with the addition of several doctors (the head of paramedical services, one of EDF's doctors, a national dioxin specialist, and others), plus the regional representative of the bureau for geological and mining research, the director of navigation services, the director of the City of Lyons' waterworks - and of course my cabinet director, the regional director of emergency management, a high-ranking officer from the fire brigade, representatives of the national gendarmerie and the national police, and as I said, the mayor of Villeurbanne, his closest co-workers, and an observer from the greater urban area. I'm certainly forgetting some of the participants - what's important is that over time, this commission for coordination and vigilance fully played its role as both a scientific and technical council and an administrative staff.

Today, I would no doubt imagine a somewhat different organization, but it's true that at the time, the one that the emergency and our experience led us to develop was most useful to us and paved the way for a lot of reflection and projects for re-organizing.

Let's go back to the second case, Port Edouard-Herriot. Note that from the beginning, there was a strong presence of local elected officials who came

to see the site, wanting to be informed. They soon realized the constraints under which we were operating.

Some people are still wondering about how know-how is shared in major hazard situations like that. It's a valid concern, and it may indicate that the law, the distribution of responsibilities, and their financial repercussions need to be further elucidated or reconfirmed.

P.L.: Isn't there a risk of making an undersized - or oversized - reaction? At Villeurbanne, there was much discussion of the excessive cost of the measures requested and applied.

G. CARRERE: This is one place where you just can't cut corners. I don't even think it would be smart to do so. One year after the events, the Villeurbanne matter had been forgotten. If we had measured everything down to the wire, you could logically wonder if such would still be the case. Does that mean the pressure of public opinion drives us to make excessive outlays? You also can't neglect the immediate psychological impact: oversized measures are reassuring. That much said, there's no point in drawing things out. But you have to announce each reduction of the measures in place very carefully.

P.L.: Here's another classic question: in the midst of an already hard-to-handle situation, how do you deal with the arrivals of numerous figures with national levels of responsibility?

G. CARRERE: Now there's something that's not easy. Ideally, these guest appearances should take place at the permanent command post, rather than at the mobile one located on-site. But how do you reach that point? That's the problem.

P.L.: These two events drove you to focus your thoughts and to make some interesting innovations in your emergency framework. Could you now discuss some of the lessons you've learned?

G. CARRERE: There are several. You have to be able to count on:

1. A previously-organized operations command post that can be installed immediately somewhere close to the accident. In both cases, we saw how important it was to have an almost totally developed operations post, that can be set up without delay. And of course the need to arrange high-quality information transmission is clear.

2. A think-tank of experts that is close to the authorities but free to make its own diagnosis and statements. The Villeurbanne business gave rise to the idea that you have to have a scientific institution available that has the right to its own opinions and isn't directly tied to operations - but isn't totally excluded from the action, either. It should give advice and opinions on the measures being considered. These specialists should be able to meet with the media on a regular basis. They should be able to speak freely on those occasions, for ethical reasons as much as for practical ones. The idea is to have these specialists provide information to the public, regularly and calmly - on the model of health reports that are co-signed by the whole team of doctors involved.

Along these lines, a think-tank of experts was officially constituted in July 1987. It includes members with a wide range of skills. Now we are making an effort to have them all get better acquainted and work together a little, even though it is unlikely that they would all be called in for any given problem.

Behind this innovation lies the basic belief that administrations, so-called authorities, and decision-makers can no longer act alone in complex cases of emergency management - they run the risk of taking on considerable responsibility without having the necessary means of evaluating it.

3. Early, solid information to the media. Even at the height of the Villeurbanne incident, and during the Port Edouard-Herriot matter as well, we always proceeded in the same manner. Once or even twice a day, a group of authorities, members of the operations command post, and two or three expert consultants met with the press. We provided a presentation of the measures under consideration (at least a general outline). The press got answers to its questions. These scientific and technical answers didn't come from a politician or an operations manager, but directly from the specialists themselves - that's not the same thing.

Our experience at Villeurbanne convinced me that if you want to avoid — or limit - the development of scattered information sources, you must:

- have the authorities in charge open an information channel very quickly;
- offer journalists the possibility of speaking directly with the experts consulted by the crisis manager, as part of this information channel.

I think this approach lays the fundamental groundwork for ensuring that the way the situation evolves and the measures taken will be well understood, on the one hand, and that statements from the administration maintain their credibility, on the other.

Those are the three elements I drew from these two cases. Of course beyond that, the necessity remains for seriously deepening our understanding of the events themselves and of how the players (administrative staffs, consultants, and the rest) operate within them.

P.L.: What would you say to other local or regional political leaders who had to face this kind of experience?

G. CARRERE: I think I would tell them:

First: The biggest task facing government administrations in the future is learning to move quickly and in an orderly manner from the ordinary to the exceptional. This implies modifying how they operate, and naturally how their psychology, and even their minds, work. Based on a few very diverse experiences, it seems to me that our administrations, beginning at the regional level, can very rapidly reach the point where they are capable of making this kind of shift.

Second: As a result, you mustn't hesitate to take every opportunity to meet with existing operations teams (especially in the context of civilian or

military exercises) in order to get our bureaucrats accustomed to crisis situations and to teamwork. In addition to the special operations staffs, you need to bring in volunteer executives from the administrations and prepare them to make this shift from a standard situation to an exceptional one, primarily by keeping them carefully informed of the work, the plans, and the successes and failures of civil defense or emergency management operations and exercises.

Third: Paying attention to mass psychology, to informing and alerting the population, and to relations with the media is absolutely crucial as soon as you realize you are dealing with a major-hazard phenomenon. This shouldn't create any sort of obstacles of principle for the officials involved, and even less a source of paralysis. Instead, it should be an inevitable aspect, which should therefore be incorporated into the emergency framework for taking control of a situation.

Fourth: On a related point, local and regional leaders have to get used to a different conception of how to command and coordinate operations. Major hazards, at least those related to human activity, force us to analyze scientific or technical issues. Mastering them will bring technology and specialties into play that all involve scientific and technical advice and cooperation.

The Rhône-Alpes region recently instituted an expert committee, soon to be extended to the Southeast military defense zone, that is charged with carrying out this issue analysis and acting as an advisory body to the governing authorities. This institution will, I think, constitute a new and important element in performing and even designing administrative action with regard to major hazards. It will be an indispensable part of our relations with public opinion in those circumstances.

# 4. From other actors' points of view

Many other people are involved in post-accident crises besides the decision-makers immediately responsible for dealing with the situation. As the frame of reference reveals, one of the characteristics of a crisis is the wide range of people who suddenly become implicated. This is why we have chosen in this section to move out from the heart of management operations.

To tap this broader spectrum of experience, we met with other actors who experienced the crises that followed technological failures, which they viewed from various social, economic, and political standpoints.

In gathering their testimony, we used the same approach adopted for the preceding interviews - analyzing the case, then thinking about the fundamental aspects of that experience. Using the same technique of interviews followed by the development of a document, participants were able to offer the most pertinent presentations possible of their cases.

We have attempted here to relate the experiences and reactions of individuals playing tremendously varied roles in this type of situation - including those of victim, journalist, expert, union leader, and communications consultant.

We also chose to include a few additional contributions that highlight the richness of these discussions. This is why we include the thoughts of a leading industrial executive, of a former French Secretary of State who held a crisis management portfolio and is internationally recognized for his disaster work, and of a former French Prime Minister. The contrasting point of view offered by a radical militant who rejects the industrial world's model of technological development provides a certain counterpoint, and a leading disaster analyst concludes this section by sharing with us the fruits of many years of research in the field.

To study these different roles, we will examine the following contributions:

1. The victim: Karine Robak, president of the Association for Dioxin and Furane Victims, whose experience is based on the January 14, 1985 transformer fire in Rheims, France.

*2.* The journalist: Philippe Dessaint, editorial director on the FR 3 Champagne-Ardenne TV station at the time of the Rheims case, and on FR 3 Ile-de-France during the Villeurbanne case. He bases his reflections on having seen the former case in his capacity as a journalist, and the latter as a consultant.

3. The expert: Lucien Abenhaim, epidemiologist and expert on public health risks. In particular, he analyses the handling of the question of video terminal screens and their impact on pregnant women (seen in Canada in 1979) and of the threat from askarel and PCBs in Villeurbanne.

4. The union leaders: Pierre Bobe and Jacques Fournier of the Chemical Federation of the French CFDT union. They base their analysis on the problems that arose around the stocks of methylisocyanate at La Littorale, a plant in southern France, shortly after this product caused a massacre in Bhopal.

5. The communications consultant: Robert L. Dilenschneider, president and chief executive officer of Hill & Knowlton, one of the world's leading public relations consulting groups.

6. The top executive: François Ailleret, Deputy General Director of Electricité de France, who spent years as distribution manager for EDF-GDF. In this case, he tackles not so much the nuclear issue as the commonly underestimated problem of business culture in large organizations and its effects on crisis management.

7. A leading international figure in catastrophe studies: Haroun Tazieff, former French Secretary of State in charge of Major Hazards.

8. A high-ranking politician: Laurent Fabius, former Prime Minister of France, who was faced during his term of office with such issues as the sinking of the Mont Louis (1985).

9. A radical militant: Gustavo Esteva, formerly a high-ranking Mexican government official, now an organizer of a citizens'network. He looks at how a such a network was able to respond to the earthquake that shook Mexico on September 19, 1985. Though this case originated in a natural disaster, it is included here because it, too raises interesting questions for our discussion.

10. A major disaster specialist: Enrico Quarantelli, Director of Disaster Research Center at the University of Delaware (U.S.A.), the world's first research entity devoted to this field, founded more than thirty years ago.

With these observers, we will delve further into the chaotic world of the post-accident crisis.

KARINE ROBAK

# The electric transformer explosion in Rheims

1985

## Background

The Rheims case started with the explosion of an askarel transformer in an apartment building on January 14, 1985. It was dominated by the April 5, 1985 publication (three months after the incident) in the French daily *Libération* of the results of analyses performed in Sweden by Dr. Rappe for the monthly popular science magazine *Science et Vie,* at the (very discreet) request of Jacqueline Denis-Lempereur, one of the monthly's reporters, known for other scoops of the sort. This data was troubling, not to say alarming, and it changed the backdrop to the incident drastically: the contaminated building - which residents had been vigorously "encouraged" to clean - was sealed off by public authorities. A medical commission was named to survey the health of the 200-odd people who had been exposed during the previous three months. Electricité de France (EDF), responsible for the faulty installation, received an official court summons.

As early as January 15, and since that date - given the available technical data (no fire, therefore no lysis of the askarel, hence no release of highly toxic substances, e.g. PCBs) and the statements made by the firemen consulted ("nothing other than a few burnt cardboard boxes") - EDF had been saying the accident was no cause for concern. Analyses performed in February by the main laboratory of the Paris police and by the French coal works board had supported this initial interpretation. In contrast, the residents, driven by two occupants (one of whom was a labor inspector), had taken a more reserved stance about the danger they, and all those busy cleaning the building, were in. In vain: under the combined pressure of the regional sub-prefect and EDF, they were summoned to put aside their hesitations and get busy cleaning. The sub-prefect gave the orders, and the electric utility implied that if its demands were not satisfied, the residents risked bringing down the wrath of its insurance company upon themselves.

In March, the Ministry of the Environment, not satisfied with the degree of precision in the analyses from the two French laboratories, asked a team from the University of Waterloo (Canada) and Ecole Polytechnique in Paris to carry out new tests. Ten days after Sweden, these studies, released April 15, confirmed and substantially darkened the diagnosis published in *Libération:* Seveso-type dioxin had been detected, whereas Dr Rappe had only stated that his equipment had not allowed him to confirm or deny the presence of this substance (so important because of the effect it can produce on the media and on public opinion).

Dioxin, dioxins, furans, toxicology, confidence, and the unknowns were all to fan a debate that had been called for from the start - in vain - by the two most active occupants. Brushed off almost everywhere, the two women had received decisive support from the journalist from *Science et Vie.* After three months of conflict, incomprehension, and roadblocks everywhere, discussion opened up, under very poor conditions. Against a

backdrop of widespread suspicion, feelings of anguish and uncertainty - essential aspects of any crisis - had to be dealt with. After three months of deep chill, this was a swamp, highlighted by:

- anguish of one group (blood tests on April 22 revealed traces of toxic products in six individuals), determined to obtain a proper settlement for damages suffered, i.e. the loss of all their belongings, and scornful of the rumors spread on their subject (the fact that they were women gave rise to particularly pointed reactions and statements);
— impatience from others with the importance given to the matter by the media (especially in the regional press: the local paper put a "Rheims-on-Dioxin" banner on all its articles); certain awe at the amounts of damages to be paid (considered by some to be scandalous); anger at the abusive use of the volatile term "dioxin"; and aggressiveness, sometimes expressed forcefully and in public, toward journalists'writings and judgments, held to be demonstrations of incompetence or of outright dishonesty; annoyance, at the least, with the stances taken by the government (and primarily with the Ministry of the Environment and the engineer handling the case in Rheims); and lastly, a barely repressed rage toward the Canadian laboratory and its French representative, guilty of having produced erroneous results on April 15 (that wrongly indicated, in particular, die presence of massive amounts of "Seveso dioxin"), which reinforced the impact of the announcement of the Swedish laboratory's results.

Since July 1985, positive gains have been made in terms of the health issues, but the victims emphasize that serious doubts remain. They continue to regret the same tendency toward secrecy that has characterized the whole business. Of course, they manage to learn the results of medical analyses made, but only by using ruses worthy of James Bond. Experts in the fine art of slipping around bureaucratic defenses, they can savor this ongoing guerilla warfare, but are nonetheless distressed that the stage on which these little games are being played out is their health. They wonder what sort of collapse it takes to make giant bureaucracies understand that an attitude of flight is inappropriate for anyone - especially those who think this attitude can protect them from public rage.

Karine Robak is the labor inspector mentioned above and one of the residents of the building where the transformer was located. After a quick personal investigation in the two days following the explosion, she was the first one to blow the whistle: the accident's conditions could have caused the release of highly toxic substances; measures had to be taken to protect everyone - the building's residents, the employees involved in cleaning the building, inhabitants of the city generally (because of the potential extension of contamination via release of untreated waste water, soiled clothing given to dry cleaners, and so on). As a labor inspector, she not only was used to such investigations but also had access to documentation on toxic products and was well versed in administrative procedures. Shortly after the accident, she was seconded by another apartment owner in the building, Arlette Botella, a luxury ready-to-wear merchant. Arlette Botella's ignorance of the administrative world meant that she never troubled herself with the procedures traditionally governing how cases are processed. Such an odd couple was bound to elicit disarray, as they were not easy to categorize, especially by their political beliefs. Nine months after the initial events, they created a defense association.

Two and a half years later, we went over the case with Karine Robak, president of this association, to see how a victim lives through a crisis of this type. We asked her to try to take a somewhat objective stance with regard to the event.

P.L.: I've asked several leading management figures to tell me how crises "fell into their laps" and what the most difficult moments were. It would be interesting to ask you the same question, as you were in the role of a victim.

K. ROBAK : As a preamble, I must underline that there's no such thing as a typical victim. Everyone reacts according to his or her temperament, and we

know that crisis situations reveal individuals as they are deep inside. That said, we can perhaps identify some guidelines characterizing the situation in which victims have to fight. The point best illustrated by our case is the difficulty of fighting almost everyone at once.

### *Fighting on all fronts*

First, there's the shock of the accident. In our case, the sequence was the following: a violent explosion that shook the building; a power outage that plunged us into darkness (at 7.40 pm in January); thick smoke and soot that infiltrated everywhere (garbage chutes, air shafts, apartment doors opened bruskly). We were suffocating, so we took to the balconies, where some of us had to wait one or two hours, in -20°C temperatures; a fire broke out in the basement but was quickly brought under control; the firemen finally rescued us and made us breathe some oxygen before taking us to the hospital for a routine check-up. At the end of the evening, we came back home. The apartments were completely covered in greasy soot. What a horrible sight!

A first observation: the victim is strongly destabilized by this brutal loss of his or her habitat. You feel deeply depressed, you feel things are unjust. All the first reaction is to erase the traces of the aggression. Everyone is seized by a frenzy of cleaning and putting in order. This is an animal reflex: you remake your nest. No time to ask yourself questions - you go to it with mop and bucket! And then there are exhausting steps to take: discussions with the tenants' association, with cleaning companies, with the insurance and their experts - not to mention the difficulties in camping out at home or living with friends.

I also fell into this routine, but not totally, because my profession alerted me to the risks connected with electrical installations and had instilled in me an accident-investigation reflex. So I began to ask myself questions. Several facts alerted me: headaches, vomitting, bleeding and itchy hands; the sorry state of houseplants; an electrician friend who said, "It smells like askarel in your home"; a very recent article in the journal *Face au Risque* dealing with the subject and detailing a previous, very serious accident; the worried observations of a family doctor called to the building. A call to an engineer at INRS, the national institute of security research, confirmed my worries. A whole cluster of elements convinced me that the situation had to be examined very closely - something was up.

I then did everything to make the other homeowners react, all busy cleaning away - as if it was ordinary dirt: "Stop, or at least wear gloves! Don't walk barefoot! You can't just give your clothes to the dry cleaner like that! We can't simply throw this dirty water into the sewer system!"

My second observation: it isn't easy, in fact it's almost impossible, to convince victims that they have to deal seriously with the situation. Everyone wants to be left alone to clean in peace. And if you insist, the reaction is of the type, "If there was a risk, the people in charge would say so."

The third front is of course against the company. How can you obtain recognition that there is something to be investigated? You run into a wall. Orally, the refusal was brutal: "There is no risk because there can't be one: transformers are our business." I'd bring in the literature, which earned me the haughty remark, "Madam, you take yourself for an expert!" The eternal refrain was, "There is no risk; the conditions weren't there [the transformer didn't burn] to produce the substances you're afraid of." Sometimes voices were raised, because there, back to the wall, was Arlette [Ms Botella], who wasn't used to being roundabout:

*Arlette Botella, dialogue with EDF Rheims:*

EDF: There is no risk.
Arlette: If there's no risk, say so in writing!
EDF: We can't write it We aren't competent to do so.
Arlette: If you're incompetent, then shut up!

In writing, the first letter we received basically warned us, "There is no problem because there can't be one. And if you maintain the contrary, you'll see what our insurance company thinks."

But there were other fronts. No one wanted to stand up after the accident and cast doubts on the official story, or muddy the waters. People worry about their respectability, about the dangers in sticking their necks out for such an uncertain matter. So for us, we rapidly felt we were working in a void. There was no one in charge, just slippery officials:

*The desperate search for a contact :*

The firemen: No problem, because EDF says there's no risk.
City Hall: This isn't our sector.
The prefecture: See the sub-prefecture.
The sub-prefect: This matter doesn't concern us, because it involves a dispute between a company and private citizens.
The municipal laboratory: We aren't equipped to do the analyses you request; you'll have to contact the central laboratory of the Paris prefecture of police.
The central laboratory of the Paris prefecture of police: We can't do anything without an official request from the Rheims City Hall or the prefecture. Back to square one.
The deputy mayor in charge of security issues - who was also a medical doctor - was convinced of that by definition, EDF could not be mistaken: hence his edifying response: I don't need to examine you, because EDF assures me there's nothing wrong.
Contact the media? EDF assured them nothing was wrong. For weeks on end, only EDF representatives were interviewed. In the written press, only the voice of EDF appeared on the first day - and afterwards, there was no going back over the question: you don't go back to a story, that's a media rule.

That gave Arlette another chance to show all her capacity not to be hindered by rules of diplomacy. She called EDF in Paris, asked the switchboard operator for "the big boss", got hold of an official, and learned that samples had been taken for analysis by the coal works laboratory

(CERCHAR) and by the Paris branch of EDF. She then went back to edf Rheims:

*Arlette Botella, dialogue with EDF Rheims:*

Arlette: Sir, do you know when you'll have the results from CERCHAR?
EDF: Results from CERCHAR? What CERCHAR?
Arlette: The results of the analyses.
EDF: What analyses?
Arlette: The results that Mr X from edf Paris came and did.
EDF: Mr X? Don't know him.
Arlette: What do you mean you don't know him? He came clandestinely to Rheims without warning you? It's a good thing Mr Y informed me!
EDF: Who is Mr Y?
Arlette: You don't even know your superiors!
EDF: Madam, in any case, we don't have any information to give you.
Arlette: Sir, does it bother you to give me information that might interest me? Does it bother you to tell me that you've had secret analyses made? That means that at the time, you suspected something was wrong!

The same went for the mayor of Rheims. One evening, Arlette announced, "Things can't go on like this, I'm calling the mayor at home."

*Arlette Botella, dialogue with the mayor:*

Arlette: I'm Mrs Botella. Excuse me for troubling you at home, but it's impossible to reach you at City Hall - you're always in a meeting or absent. So I'm calling you at home.
Mayor: What's the matter?
Arlette: Well, sir, here's the matter: you know very well that there was an explosion in Rheims; you know very well that everybody has rejected us, that no one will help us. You know very well that a mayor's job is like a mother for a home. You're there to help and advise us.
Mayor: Madam, I don't know what your political persuasion is, but let me tell you that …
Arlette: .. .Oh! I'm of the same persuasion as you, but you may make me sorry I am!
Mayor: You know very well that they've put a spanner in the works at the municipal level. At the Ministry of the Environment, they aren't of my political persuasion. I've already made several requests, but no one replies. Madam, that's normal: a left-wing government and a right-wing mayor... At edf as well as at the prefecture, they've simply left me out, saying it's a private matter that has nothing to do with the City of Rheims.
Arlette: The sewers that are being polluted, the sidewalks that are being polluted- do they belong to you?
Mayor: Yes.
Arlette: Well, then?

EDF's authority blocked all power, which disappeared instantly. What's more, other networks contributed to reinforce this paralysis. Many of the officials were prominent members of groups like Rotary Club, a political party, or the campaign staff for a local politician. In short, everywhere we ran into walls. No way out. The only ones who at least listened to us were

Environment in Paris and in Châlons, the regional capital. But they have so little power.

The result is twofold. On the one hand, the victim rapidly is placed in the position of a suspect, guilty of being impudent enough to stand up against public policy and the State's prerogative. On the other hand, the victim no longer sees a way out of the problem. Was I going crazy? People suggested I was. Yet it didn't seem so: eminent colleagues of a certain highly-placed figure told us secretly to hold on, that the situation wasn't as harmless as the authorities were letting on.

So we doubled our vigilance on all fronts. We were on the alert to any slip-ups, any data. Should we automatically trust a medical commission? As soon as they arrived, even before examining us, these doctors declared that there were no symptoms. Believe the reports we received, on Seveso, for instance? We'd been told, on site, that they were heavily biased by political interference: the medical follow-up hadn't been very strict, given that fortunes had been paid to people to leave the region. But everyone pretended to be taking things seriously. However, we did get one allusion from an official at the dioxin office in Seveso: "You know, in Italy, there's always a combinazione."

We had to fight all down the line. To have analyses done, to get the results, to try to have simple typos corrected in the analysis reports (errors recognized by the laboratories but denied by EDF), to demand that analyses be done by laboratories actually capable of performing the highly complex tests that had to be done, and so on.

Arlette called the Ministry of the Environment. "Do something! If you don't do something, I will! Give orders! We're tired of hearing you say, 'That's not my sector." We had to go on fighting when we were caught in the crossfire over the lists of property that we had to draw up for the insurance companies. On one side, the doctors from the medical commission specifically forbade us, during a meeting at the Ministry of the Environment (four months after the accident!) to go into the basement to draw up these lists: "Madam, stop right now! You simply must not handle those items, you must not be in contact with these chemicals." On the other were the insurers, who couldn't care less about the medical opinion - no list, no reimbursement: "Madam, every single article, otherwise we can' take anything into account." My mother, who wasn' tin the building at the time of the explosion, but who came to help me make the list, is now one of the most severely contaminated persons.

Our only real source of support was Jacqueline Denis-Lempereur of *Science et Vie.*

## *A Few Lessons*

P.L.: If we leave aside this particular case, what are the general lessons you've drawn from this experience?

K.ROBAK: There is one central lesson: without exceptional circumstances (e.g. extreme gaffes on the part of officials in charge, or an unusual effort by damage victims to combine their strengths), there is little hope that victims will be able to stand up to events. To see why, just look at the obstacle course you encounter in trying to mobilize people who've just been affected by an accident:

1. You have to pull them out of the depression and feverish activity that leaves them no energy or time to think.
2. You have to inform them with simple words, and it's hard to convince them when the danger is invisible.
3. Victims are profoundly persuaded that "if there were something serious, the authorities would have taken steps."
4. If you get past all that, you still run into defeatism: "We can't fight a major company." The idea that the battle is already lost is part of the mentality of a victim. In fact, there are a lot of born victims.

All the company has to do then is be forthcoming and help the people re-establish a familiar way of life. People won't ask any questions. If in our case the game had been played this way ("Listen, we caused you harm; we'll repair everything quickly; you'll be able to go back home; things will be like before"), I don't think anyone would have followed me.

P.L.: What advice would you give to people involved in an accident?

K. ROBAK: I really don't know what they can do; I don't know what advice to give... In fact, I wouldn't give any, but I'd say, "You have before you institutions, companies, experts, a whole bunch of people. But all these people have are the authority and influence you are ready to grant them." That's what we did in Rheims. We always showed them behavior that told them, "We don't give you the power." We hammered in our messages: "We won't admit that you have the knowledge you pretend to have, even though we know you aren't stupid; you confirm this and that, but on this particular point, you're lying to us." This approach brings them down off their high horses. All they had left were the trappings of their authority. Naturally, that generates enormous aggressiveness.

This is where complementary characters are useful: Arlette charged ahead, and I knew the procedures. Arlette has no concept of bureaucracy, for her it's a totally unknown world. She doesn't understand it and doesn't want to understand. More than once I told her, "Arlette, you can't say that, you can't do that! You don't besiege the office of the attorney general! You don't write 'we demand' to a prefect. You don't tell the prefect off during a meeting ("Mr Prefect, I may have come in late, but there is something I'd like to tell you. When I talk about you, I say 'Mr Prefect', but you, you talk about Mrs

Robak and Mrs Bote lia as 'those ladies'. Henceforth, when you talk about Mrs Robak or Mrs Botella, you'll say 'Madam' just like I say 'Mr Prefect'.")."

But nothing could stop her. "What do you mean you don't do that, just watch me!" She charged; and she accomplished things that I wouldn't have been able to do, because I was too familiar with procedure. For instance, with the Ministry of Environment:

*Arlette Botella, dialogue with the Ministry of Environment:*

Arlette: Give me Mr Laurent.
Secretary: He's out.
Arlette: Then give me Mrs Bouchardeau.
Secretary: Mrs Bouchardeau?
Arlette: Yes, titles don't impress me, she's a Minister, and that's all. And I'm Arlette Botella.
Secretary: I can't give you Mrs Bouchardeau, but I could perhaps give you Mr Vesseron.
Arlette: Who's Mr Vesseron?
Secretary: Her technical advisor.
Arlette: Well, all right.

However, there were other moments when knowing the procedures helped me. For example, when you make a phone call, you write a letter confirming the terms of the discussion. And there was one mistake I would never have made, but Arlette made it, because she was the one who typed the letters. At the end of January 1985, we sent a report to a great number of officials, and she marked "for information" on the cover letter. What did the prefect do? Like a good civil servant, he understood that that meant "for information" and not "for attribution". All the others did the same. That was enough to ensure that we didn't get any answers. Only a bureaucrat can find her way around in those practices. I doubt the average citizen even knows the meaning of "for attribution".

P.L.: And your recourse to the press?

K. ROBAK: Except for Jacqueline Denis-Lempereur, who gave us the impression that she took things seriously, the other journalists were difficult to work with. First, it isn't easy to contact them, either. You get rebuffed, brushed off. They're hard to convince, because you also have to explain to them what's happening - and they generally don't have scientific background. Furthermore, they're also susceptible to the assurances they receive that there is no risk.

So you have to educate them, but above all, give them pictures. That's the key: pictures and headlines. Victims asking themselves questions and talking about complicated issues don't give many pictures, so they don't capture an audience. A victim's only chance of being heard by the press is to appear on TV. You have to realize that we live in a snapshot society: as long as something is only probable, as long as there aren't 200 corpses on the ground, there's nothing serious. You are accepted as a victim once you create a picture. When the furniture was being taken out of our apartments, at one

point a woman was hugging the wall. That's a very powerful picture, and they took it.

Journalists aren't easy allies. One subject drives out another, so they're not very faithful. You have to motivate them endlessly, interest them in the problem and prove that it can get them something. These people aren't working out of pure generosity toward the victims.

P.L.: You also had to deal with the scientific world: laboratories, experts, and so on.

K. ROBAK: In this business there were people who refused to admit they were incompetent, though they were (e.g. those who insisted they could perform the necessary tests, when they couldn't), and others, on the contrary, who said it was out of their field when they had full knowledge. In the medical area, we realized that we'd been exposed to toxic substances for which the doctors don't know the real extent of the consequences. That's when they talked to us about "reassuring" results and "acceptable" limits. But we know that each time a limit is set and considered to be safe, the facts cause that limit to be reconsidered a few years later, and so forth.

When we compared certain scientists' writings with what they were telling us, there too we discovered strange distortions. There too, we had to fight - even to obtain the results of tests on our own blood. There was no way simply to receive them. Just recently, we had to finagle to get the results (once more, it was Arlette who found the breach in the adversary's defenses). But right now we're running up against the fact that one of the doctors has changed his symbol key, which prevents us from finding our way around in the results. We probably won't become sick for quite some time, so we don't interest anyone. You need dead bodies right away to capture attention.

P.L.: What about the others?

K. ROBAK: In this type of matter, you rapidly discover a whole network of people who don't want to have problems. Politicians as well as civil servants (who can always hide behind the absence of legislation, something frequent in crisis situations), professional organizations, experts, insurers, businesses. Everyone closes ranks. You need the devil's own energy or rashness to pull through. You also have to resist attitudes of disdain - disdain for someone who "causes problems", disdain for women who ask too many questions, especially technical or scientific ones ("A woman isn't meant for that."). In fact, everyone was waiting for us to crack. Then we would have been coddled, and they even would have taken pictures! We rejected that strategy.

But above all, I learned that, quite naturally, our primary difficulty was the passiveness maintained by the victims. That's what's most serious. Taking action is exhausting. And what's more worrying, even if you manage to win (after all, we have made progress in our case and in the legislation as a whole), many victims still regard the whole thing as a failure ("What does it change?"). That's an underlying attitude. Some prefer to believe that it isn't worth the effort, other wise they would have to recognize some serious

things: a citizen can't place blind trust in institutions; you have to take responsibility yourself.

It would be so easy for large companies to hire social psychologists and carry on business as usual... All the odds are in their favor.

But it only takes a spark...

PHILIPPE DESSAINT

# Crises involving Askarel and PCBs

Rheims, 1985 - Villeurbanne, 1986

## Background

An EDF transformer exploded in Rheims in 1985, another EDF transformer station burned in Villeurbanne in 1986. We will discuss these incidents here with Philippe Dessaint, who was not only involved in the Rheims incident as a local journalist but also acted as a consultant at Villeurbanne. His latter role deserves a word of explanation. After the 1985 accident, the executive leadership at EDF decided to undertake an examination of the crisis it had just come through in order to see what lessons could be learned. Outside observers such as Philippe Dessaint were invited to participate in this re-evaluation process - to achieve a serious degree of self-criticism and to make in-depth changes, it appeared essential to receive input from the outside. To this end, when the second crisis was unleashed, EDF management decided to send technical and medical experts as well as a team of communications consultants to the scene. Sending the latter group marked a first-ever innovation: four people who had been through the Rheims crisis were sent to Villeurbanne to work with local officials - without challenging the distribution of responsibility within the hierarchy. This team was comprised of two persons from within EDF and - another innovation - two journalists, including Philippe Dessaint.

Dessaint's experience is particularly thought-provoking. He lived through the large-scale crisis that was generated by the handling of the Rheims case. He saw how the automatic reflexes used to handle the Villeurbanne incident were starting to lead in a similar direction. With other members of the support team and some local officials, he managed to bring about a lightning review proving it was necessary to take a radically different approach to communication in that type of circumstance. Rheims was an archetype for failure. Villeurbanne was a watershed, with an early phase in which behavior followed conventional patterns, and a second phase in which more open-minded attitudes were tested, successfully.

After working as editor in chief at FR 3's Rheims-based regional TV station, Philippe Dessaint became editor in chief for FR 3 in the greater Paris area. He is also a nightly-news reader.

P.L.: Both for Rheims and for Villeurbanne, you had a specific role to play. In a way, you've been on both sides of the fence. But let's look first at the Rheims matter. How did it fall into your lap, so to speak?

PH. DESSAINT : The most surprising thing about this crisis, deep as it went, is that it didn't fall into our laps. It took a very long time before it began to look like anything but a simple accident. On January 14, 1985,

around 8.15 pm, I was leading an editorial staff meeting when the fire department informed us that a transformer had exploded. A small fire had led to the evacuation of the occupants of the building in question. After some hesitation, I decided to send a crew out on this simple news item, mainly because it served to illustrate the impact of the exceptionally cold temperatures we were enduring (-21° C). I hesitated because the event seemed so harmless. The next day, my assistant even wondered whether it was worth broadcasting the report, since "EDF says it was nothing." We aired the piece anyway, with a commentary that was a simple rewrite of EDF's side of the story. So the first televised presentations were actually platforms for EDF officials.

A month went by before a journalist in a staff meeting mentioned the potential danger of emanations caused by the transformer explosion. Some of the occupants had told him they were worried. We checked the information - with EDF. Their tone hadn't changed: "There is no danger, because the transformer didn't burn." About the building's two most persistent occupants: "They're hysterical women. They've got a grudge against EDF." We interviewed one of the women, who happened to be a labor inspector.

March marked a transition for us. What with the incoherency in the behavior of EDF officials, the written-in-stone quality of their assurances, and their disdain for the building's occupants, the picture slowly began to change. From blind trust in EDF, we shifted to stubborn defiance. The journalists began checking their information with the inhabitants, who were well organized and based themselves on scientific research. Double-checking with City Hall was of no avail - there, they swore by the EDF version of the facts, before withdrawing completely from the debate because "it isn't our problem." The editorial staff became persuaded that from the very start, EDF had either been mistaken or, worse, was lying.

At FR 3, we began to realize we'd made a mistake originally and had been unwittingly leading our audience down the garden path. When Jacqueline Denis-Lempereur's article appeared in Libération on March 25, that was the turning point. I could see that we were no longer credible. It was time to stop the farce. The next day, we did a special information show on the subject.

As you can see, it wasn't an accident that fell into our laps, but rather a communications crisis - and three months after the fact. An ever-widening gap had grown up between what was being said and what we could see. On one side, there were growing doubts. On the other, EDF was just as unyielding in its assurances. A little like a ship's captain in a sea of icebergs who continues to proclaim that we're sailing in the Caribbean.

P.L.: What lessons did you draw from this first experience?

PH. DESSAINT : When the Rheims transformer case got started, I was totally new to the issue of post-accident crisis communications and without any preconceived ideas. Most of what I had dealt with were labor crises, with their well-known features: an employer manages to deny an event (layoffs,

for instance) whose existence becomes more and more obvious. The problem grows, and this labor crisis is reinforced by a communications crisis. But here, things were different. I didn't realize at the start that we were headed for a crisis, and that's one of the biggest lessons in humility this case gives us. We're supposed to be the communicators but we don't know, and at the start nobody knows, if the ingredients for a crisis are all there.

When a ferry sinks, you know almost immediately that it's a catastrophe. In the case of Rheims, a crisis that was fairly slow in getting started, we didn't know. I don't think anybody, any media person in the world could have said, "Look out, that's going to bloom into a major crisis." But you have to add nuance my prudent warning. Today, I would pick up much faster on the components of the potential crisis, because I would watch one vital indicator on the dash board: changes in the relationship between actors. In Rheims, it hit the red zone. My general opinion about that period is that a single, localized crisis spun off into political crises, administrative crises, medical crises, and media crises. What was fascinating was to see that the primary crisis didn't become weaker as it produced offshoots. To the contrary, it seemed to feed on them. And you got the feeling that even if the original core could be healed, the secondary crises had become self-sustaining. They could find their own elements to feed on. That's what started me thinking about the issue of crisis and made me wonder how such a process can develop - from the simple explosion of a transformer.

Then I went back over the declarations that had been made. I think that the linchpin of the crisis was just that - everything that had been said, that had been denied, everything that couldn't be supported, that couldn't be done. Each time you fumble (especially by making dubious assertions), you sink a little deeper into the crisis, and you erode your stock of confidence a bit further.

I've discovered that the key parameter is time, the time over which events are played out and things are said. When there's a gap between those two elements, you're moving onto slippery ground. What I find fantastic is, a crisis may never be completely finished. You can always do "even better," i.e. bury yourself even deeper.

That's what I saw at Rheims. An incredible energy was wasted because EDF people were so self-contended, because certain politicians were so busy looking after their careers, because some members of the press weren't on their guard - and FR 3 tops the list, I'm the first to admit it. Let's say that our combined incompetence and immaturity in a number of areas meant that together, we created our own little crisis, which of course fed off the main one.

This experience taught me my first lesson: you need to manage over time. It seems clear to me that that crisis wasn't born in forty-eight hours. Rheims is an even more interesting example because it wasn't a spectacular crisis. The story was lightweight at the outset - between degenerating and disappearing, it could have gone either way.

I would also note that finally, nobody was credible anymore - not even us, after tagging along with the official story for months. We all went through a strange and rather unpleasant period, like a game of poker where everyone is bluffing and there's no semblance of order anymore.

### *Villeurbanne*

P.L.: The Villeurbanne case presented itself very differently for you.

PH. DESSAINT: Above all, when Villeurbanne came along, we had Rheims behind us. The word askarel had acquired a connotation, and we'd learned that the event could lead to a crisis. We made two moves as soon as the second incident occurred: first, we called our colleagues in the area, at FR 3 Rhône-Alpes. It looked to them as if things were going to get messy, and they asked for my help. I agreed if necessary to come to Lyons. Second, I called EDF's regional director in our area (Champagne-Ardenne). He reminded me of a suggestion I'd made during our discussions of the Rheims business - that a support team should be sent to guide the officials working "on the front," and especially to help them adopt more open communications behavior, unlike the company's traditional culture. He asked me if I was ready to go along with that and participate as an outside expert in a support team. Now of course this request made me wonder, "Ethically speaking, can I do that kind of work?" The answer was easy, since nobody was asking me to play a double role (it wasn't happening in Champagne-Ardenne) or work against my natural role. I think that to be effective in this kind of situation, you have to tell the truth. Since that's what I believe as a journalist, I've never backed myself into a comer. Sol accepted.

The kinds of questions I began asking when I arrived there were, "Where are things already starting to seize up?" I got to the EDF center in Lyons a few hours after the other three members of the support team - who had been rather badly received, as you might expect under the circumstances, since officials are always afraid someone will take away their prerogatives. When I arrived and caught up with the group having dinner with the Lyons EDF officials, I heard things said that made me think, "We're right where we were in Rheims, that experience didn't accomplish anything." For example, I heard the director of the center say, "I'd be ready to go sleep in that transformer station," even though he himself admitted that he didn't really know what had happened to it. Another official stated, "In any case, there's no problem here. Unlike Rheims, we've got a hold over the press - we know them." Their third fundamentally untenable idea was that in forty-eight hours, it would all blow over. I also heard their self-confident statements about how absolutely leak-proof the retention basin under the damaged station was. "Nothing could get through." After listening to them throughout the meal, I said to my neighbor at the table:

"Listen, the fact is I'm ready to get on the next plane back home. I didn't ask to come here. I'm not getting paid to be here. But if we're going to be of some use to you, let me tell you what I really think. In my opinion, you have said three stupid things:

First, you can keep your hold over the press, as you put it. But when things begin to go awry, it won't matter if you've been taking them to lunch for the past ten years, they still won't follow you blindly. Also, don't forget that the press isn't just regional - national and international media could get into the act, and then you can't do a thing.

Second, when you say, "In two days, it'll all be over," don't forget that in Rheims, it took at least a month for things to get started. There's no way you can be so sure of yourselves.

Third, if the slightest traces of furan or anything else are detected, all the ecological associations are going to offer the director of the center a mattress so that he can actually go and sleep in the transformer station. Then you'll be stuck, unless he backs down. So if I were you, I would be careful."

The center's deputy director listened to me and cut short the general conversation. "We've got to start from scratch, because we've clearly taken a wrong turn somewhere." I think from then on, they made a strategic about-face. No more blocked stances, no more incoherent ideas. Even if the situation kept changing, it became possible to hold a position without doing flip-flops.

The next morning, I walked into the regional headquarters and saw all these long faces. "Just our luck, the retention basin wasn't leak-proof. What do we do now?" It was decided to publish a first communiqué, without waiting for the news to get around, with a statement along the lines of "Contrary to the indications we gave yesterday, the retention basin which we thought to be leak-proof has allowed, etc."

At last! Maybe the case wasn't as serious as Rheims. But all the ingredients were there for a much higher-profile crisis: spectacular amounts of smoke had been released, it was the second such incident, there was a concentration of political power that Rheims didn't have, askarel had leaked out and might, it was feared, get into the water table (which happened to be used directly by a yogurt factory, among others), people had been evacuated, and so on. The potential was there to go careening into a crisis at least as big as Rheims. But in this case, as I could see with my colleagues at FR 3 Lyons, an atmosphere of trust had been established. Everything was brought out into the open, no attempts were made to cover things up. It also helped that the crisis hadn't just been diagnosed by the inner circle, where by definition people were a little paranoid ("they're out to get us, they think we're too powerful"). All this meant that at no time did EDF find itself in a position where it had to lie or cover up (even if it was accused of doing so anyway). I think that's one of the reasons why Villeurbanne, which could have been a thousand times bigger, actually calmed down pretty quickly to what it was about - simply

managing a technical crisis instead of having to manage a discourse that rang false from the start.

P.L.: And now, as a journalist, what would you say about the management of this type of technological crisis, more broadly speaking?

PH. DESSAINT: I'd say that the biggest battle has to be fought within the first twelve hours, or even within the first six hours after the accident. The climate of trust has to be established immediately. You have to set up a group to take charge of communications problems, and it must work in symbiosis with the group in charge of the technical management of the incident to provide information. Not so much information for its own sake, but to demonstrate at a basic level, "I'm giving you this information because I recognize that your interest in this matter is valid. We can trust each other." And in those twelve hours, either you create that atmosphere of trust, or you generate wariness.

I'd say that in this country today, there is an underlying (and perhaps legitimate) suspicion. In any crisis, journalists think, "Look out, they're going to pull the wool over our eyes."

But if the actors take the initiative in this kind of situation, in the first hours following the event, to call up the press, to organize a press conference - even if all they have to say is, "We don't know much, but we know this, that, and that. You can set up shop here, and use these telephones. Every two hours, we'll give you a briefing" - then we could break out of this pattern of systematic failure. That may sound Utopian, and yet it's the least expensive, most efficient, and most profitable solution. So if people focus on that early on, things are off to a good start. After that, the contradictions can't have the same impact.

However, if during twenty-four hours there's a news blackout, you'll soon have to begin denying what the associations, the unions, or whoever else has said, and you'll be up to your neck in tension and contradictions. That's why you have to give information really fast. And that's actually what EDF has begun to do. A notice is published about the slightest EDF incident. And this overabundance of information actually leads to a certain loss of interest from the implicated parties - whereas silence provokes tremendous curiosity. Of course you can draw a cynical interpretation of this observation. But you can also think seriously about it, and realize what the outside actors are asking for: "Something's gone wrong for you, but that doesn't necessarily mean you're criminals. There's no such thing as '100% risk-free," we all understand that. So tell us what you know." If that kind of atmosphere can be created within the first hours, then you can guarantee that things stay coherent.

It also seems crucial that those caught up in the crisis (e.g. businesses, public authorities) find a way to get another point of view on things. They need somebody else, with a different mental framework, whose career is not

at stake and who can say freely what he or she thinks. This fresh look is the best contribution to avoiding making the wrong strategic choices.

P.L.: One recurring question is, should the person in charge really tell all?

PH. DESSAINT: One thing's for sure, the decision to cover up is dangerous. Though by definition, when there's a cover-up, the press doesn't know it.

But this choice and this type of behavior are frought with risk. If the people are found out, it's like a bomb exploding in their hands. They lose all credibility. Also, this approach can prove to be dangerous in the long run. The slightest evidence of cover-up will get out of control and discredit their whole operation.

If a journalist discovers a single example, he will be tempted to keep digging. No one can ever assert mat an incident has slipped by unnoticed. You can simply say that to date, it hasn't been uncovered. In the case of major technological hazards, I think it would be foolish to try to hush up a radioactivity leak, or the fact that a radioactive cloud has passed overhead and will pass nearby shortly. I think that would be stupid. Using silence is like setting a time bomb. The day the information gets out, there's nothing to be done. It's really a form of suicide.

So I would say that withholding information is a source of momentary comfort that is highly costly in the long run. People say, "Hold on there, let's not tell the press, they wouldn't understand." That's fantastically comforting for about twelve hours, but it takes weeks and months to repair the damage. Or, to use a medical metaphor, it's like saying, "The dentist's drill hurts too much, so I won't get my teeth fixed." Then you spend four sleepless nights with a horrendous toothache. Silence is really comfortable for about twelve hours, and it can pay off - it would be hubris on our part to say that throughout history, no one has ever managed to keep the lid on an accident. But generally speaking, it's a time bomb, and when the lid blows, there's nothing more to be done, because your credibility is gone.

But an important question is, how to say what you know? Now it's true that there's no point in frightening the population. But don't jump to any hasty comparisons: informing people doesn't necessarily mean reassuring, either.

P.L.: What are your feelings on this issue of credibility after seeing how the impact of events in Chernobyl, Basel, and elsewhere was handled in neighboring countries?

PH. DES SAINT: In most cases, the population and the media are already inherently suspicious. When something happens, we have the feeling that we aren't getting all the information, that things are being hidden from us. For years, France has been attached to a solid tradition of secrecy. This means rumors and approximations spring up immediately. I know full well today that if one source won't give me any information, I'll look for it elsewhere, even if it is more approximative. I won't accept the wall of silence, and nobody in this country will. So we go look for information from other

parties - who may be less solid or less credible. And as soon as that happens, the official in charge has put himself on the defensive, in a position of having to justify. For example, this may involve denials: "Contrary to allegations made," and so forth. This is the worst possible situation to be in. The official in charge arrives on the scene like a criminal arriving in court, obliged to offer justifications, assumed to be ready to lie, having lied once already by omitting to speak up.

So I'm persuaded today that the public does not trust the major actors in a technological crisis - even the press doesn't have their confidence. So we have to be very careful not to replay scenarios like Chernobyl.[1]

P.L.: I'd like to go back to a point you mentioned about the Rheims case. Journalists have very little room for manoeuvre, because they have to maintain public trust.

PH. DESSAINT: Yes. You might be tempted - out of sympathy, because you know these people, because you can see the awful mess they're in -not to question them too hard. But as we saw in Rheims, the press can't follow the actors in a crisis down the slippery slope of eroding credibility. There comes a point when you have to set yourself apart. If you've followed them too far, you even have to rebuild your credibility by kicking people when they're down. Let's be honest: if your capital of public trust begins to wash away, you look for a lifesaver - and one person's lifesaver is another person's troubles. That's why FR 3, in its own public-trust crisis, attacked EDF, saying "You screwed up" - to rebuild its own credibility. We'd screwed up as much as they had. Cover-up and suspicion create a vicious circle that's never very wholesome.

P.L.: Now can we talk a little about that circle?

PH. DESSAINT: We as journalists are persuaded that the people in charge (whoever they may be) want to hide things from us and lie to us. And they are wallowing in what is often highly visible corporate paranoia, persuaded that we'll do absolutely anything to muddy their reputation. All the elements are there to make the situation explode, and invariably it does. One way out today would be for the people in charge to have enough innovative capacity and enough initiative to open up and escape from this perverse system. That explains the interest in experiments like those done around a high-risk plant such as Rhône-Poulenc in Pont-de-Claix, or in the Isère region (Translator's note: Isère is an area combining mountainous terrain with chemical and nuclear industries. Studies were made there of all potential hazards and followed up by broad public information campaigns.).

P.L.: So just what changes should be made in the usual behavior of these actors who find themselves caught up in the momentum of the crisis?

PH. DESSAINT: As far as the officials in charge are concerned, I'd say that a period of technological crisis cannot be reduced to fit what they are used to

1. Most French observers were surprised to learn that the cloud of radioactivity affecting other European countries had stopped short at the Franco-German border.

doing. Press attachés are at a loss in exceptional circumstances. They're fairly good at organizing press luncheons and trips, but much less good with situations where everything is turned on its head. And this little detail points to a much vaster problem. Even though there are people today who try to think about how they can avoid sinking into the morass in the first hours of the crisis, on the whole industrial structures are thrown into complete disarray when trouble comes. It is completely out of scale with the way they're used to working. And with that, fear takes charge and their mechanisms begin to backfire.

As for the press, I recognize that there are a lot of problems, even though I think overall, it does a good job of covering events. It is thought of as an arbitrator, or it sets itself in that role, so that the press becomes both judge and jury. It also has a tendency toward caricature - but this danger is related to the very way the media work. Everything has to be said in thirty-second or one-minute sound bites. You can only do that if you take an item out of its context and exaggerate it. And I have to admit that in a way, we feed the crisis, either by ignorance, or because we want to do that great article. Faced with all these snares, the players may prefer to remain silent, or at least to be very prudent, if they don't resort to newspeak. The press's behavior can lead them to adopt a somewhat hollow language.

When the two meet, that becomes the source of all the difficulties, and of a blocked situation. Obviously, the dispute is open today. Journalists can reel off the list of an official's cover-ups. The official will tell the journalist, "Three years ago, I said that a certain chemical could potentially, under specific conditions, prove to be dangerous. Imagine my surprise when I saw myself quoted as saying, 'This chemical is mortally dangerous'! And the day there's an accident, everything comes to a head. The industry leader is fuming even before the journalists arrive: "The press is going to bury us again." And the press is busy thinking, "Those chemists are going to do everything to pull the wool over our eyes again." Clearly what is missing is a gentlemen's agreement. We start trench warfare when we should be talking together. But if the first steps haven't been taken before the incident, there is every chance that at least the first communication will be completely fouled up.

Basically, I think that given the importance of technology and of its hazards, we can't go on in this country living with this reciprocal suspicion.

P.L.: If the crisis is really very big, how should it be handled?

PH. DES SAINT: Before talking about that, I'd like to emphasize two points. First, I think that paradoxically, the difficulty doesn't have anything to do with the scale of the accident. Second, I think that high-ranking officials can pull themselves out of the usual briar patch, even if they find they've fallen in once again. All it takes is for people at the highest level to admit that an error has been made, that inexact statements may have been made. This is what happened at Villeurbanne: "Contrary to what we announced previously, the retention basin was not leak-proof." Even when the situation has degenerated

severely, you can still do something - provided you realize that the mea culpa can't be used over and over.

Now let's look at the question of an extreme situation. Let's say we learn that a radioactive cloud is hanging over France, and no one knows when the weather will drive it away. We're pushing the example to the limit, but let's suppose this scenario could happen. If I were an official then, I would immediately do two things: call together a crisis team at the highest level, and announce a press conference. During the press conference, I would give a first description of the problem, even if I had very little information - at least you can stop wild speculation and narrow the definition of the hazards.

But I think I would try to communicate on a second level, and to transmit this message: "I'm going to inform you, I'm going to give you information, even if I'm not able to interpret it. I'll try to bring it gradually into focus." In other words, I'd create a climate of trust. Then I could count on receptive partners when it came time to give instructions (whether general or specific) or reduce the level of vigilance. Above all, I'd try to tell myself, "Information is too dangerous to be left by the wayside, hi this country, there are too many people who have information for us to be able to give this event the silent treatment. So I might as well be an information source. I have to be credible and establish trusting relationships right away."

What if I don't? I have to realize that on the other side, everything is ready to track down information. Here's an example from our own methods: in Paris, when there were the terrorist bombings in 1985, we were never informed (of course the police had other things to do besides call us in those cases). So, we retrained one of our men and bought him a high-frequency scanner. He spends all day with his ear glued to the scanner. Now we're out there at the first indication. In other words, when there is no satisfactory method, you make due with something else, but you always find a way. So if there were a major accident, I'd have to do everything possible to reassure people that I would give them information.

P.L.: Nonetheless, there remains a substantial danger, that of systematically going too far to protect or develop credibility. In that case, when there was the slightest incident, an official might decide, as a preventive measure, to stop everything. In other words, to be a macho: "Look how serious I am, you can trust me, I'll stop the whole works." That's tempting for an official more concerned with image than with the general impact of an action. Isn't there a danger of the pendulum's swinging too far in the other direction?

PH. DESSAINT: It's true that the danger exists: imagine evacuating Lyons (population 800,000) when there's an incident next door in Villeurbanne. In general, I'd say that just as handling a crisis technically without communicating is a grave mistake, management communication without technical knowledge is also disastrous. What's needed is to measure the range of potential dangers with the specialists, then, based on this diagnosis, to

develop communications adapted to the situation. The key is to keep a sense of perspective, intelligence, and coherency.

P.L.: Just what lessons did you learn from your experience as a crisis consultant?

PH. DES SAINT: One of the risks for the consultant (especially in the communications field) is that the decision-maker will turn to you and ask you to clarify a technical doubt, or to decide for him. For instance, at Villeurbanne, one of the executives turned to us and said, "Do we shut down the yogurt factory or not?" The plant was near the site of the accident and drew its water straight from the water table. But we all have to stay within our roles, within our specialties. I would never allow myself to offer an opinion on whether the yogurt factory should stop operating.

Why, at Villeurbanne, I even heard someone say, "To think that we didn't even want you to come - now that we've seen how things work, we think that in case of a critical accident, the matter should be taken completely out of our hands, and a commando team like yours should make the decisions." I think nothing could be worse, because we don't know the whole context. Communication is only a part of the problem. On the other hand, we could help them go much further, by asking things like, "How long do you think you can defend the position you're taking?" It's true a crisis situation can bring about a very dangerous confusion of roles. This is where you can gauge the kind of disruption caused by a crisis. Often, at the start (and I saw this in Lyons), the communicators are welcomed with a smirk. Then, in a few hours, stupefying reversals take place. Completely overwhelmed, the officials in charge became convinced that we were omnipotent, and they were ready to turn over all their powers. Then you must be careful not to become giddy from the surrealistic quality of the situation.

LUCIEN ABENHAIM

# Uncertainty, the expert, and crises in public health

## Background

Lucien Abenhaim is a physician, a researcher and an associate professor at McGill University Department of Epidemiology and Biostatistics in Montreal, Canada. As an epidemiologist and a specialist in the field of public health risks, he divides his time between research and practical intervention in France and Canada. He has been working in the area of industrial hazards for the past fifteen years. He taught at the University of Montreal's School for Industrial Relations and headed program development at Quebec's Research Institute for Occupational Health and Safety (IRSST), where he worked directly with decision-makers on issues of occupational hazards (e.g. video display terminals, ethylene oxide, accident indemnity policies, information and prevention policy, standards). He has since widened the scope of his activity to include evaluating environmental, therapeutic, and technological risks (e.g. electric transformers containing PCBs). With Dr William Dab, he recently led a nationwide study in France on the epidemiological consequences of terrorist attacks. This study had a direct impact on victim indemnization policies.

P.L.: You were called in as an expert in several cases you refer to as "public health crises." Could you explain what this expression covers?

L. ABENHAIM: These are cases where the health of a population is at stake, but there is a high degree of uncertainty as to what the actual dangers are and what steps should be taken. Here are a few recent examples that provoked public health crisis situations (which were sometimes narrowly avoided):

*1979, Toronto, Canada:* Just after video display terminals (VDTs) had been installed, four women working in the offices of the daily Toronto Star gave birth to children with congenital malformations. The "preventive removal" of all pregnant women from work involving VDTs was requested throughout Canada, and the measure was widely applied in certain provinces.

*1981, Montreal, Canada:* A dozen cases of leukemia were detected in a suburb of the city. Factory pollution and the water supply were accused, and inhabitants began to wonder whether they should drink the water, and whom they should believe.

7956, *Paris, France:* Several scientists and technicians at the Institut Pasteur for biology research were found to be suffering simultaneously from serious cancers. Rumors spread about the role of viruses handled or genetic

manipulations. A committee had to be formed to evaluate the situation, with a well-known medical leader at its head.

*1986, France:* Several infants died suddenly within days after receiving a vaccination. All vaccinations for babies were called into question, and one specific vaccine was accused.

*1986, Alberta, Canada:* After a campaign against the harmful effects of sulfurous gases released by a factory, the question of closing the plant was raised, at the risk of putting a great many people in the region out of work. McGill University sent 118 scientists, doctors, and technicians to the site for three months to examine the situation.

These few examples offer a first illustration of what can be called public health crises. I use this term the way others use "hangover", "heart attack", or "nervous breakdown" - it doesn't really have a medical meaning, but everybody knows what it is - except physicians, who are the very ones who need more information to be able to do anything.

These situations have one point in common: within a relatively brief period and inside a relatively limited geographical area, what we call a cluster of often distressing health problems (cancers, birth defects, sudden deaths) appears, calling for public health decisions to be made in a fairly short time. These decisions themselves may have weighty consequences, such as stopping a factory's production, removing young women from work on computers, or questioning the value of a vaccination campaign.

They also have a second point in common: we cannot be sure that the phenomenon observed is actually due to a specific cause, and especially to the cause that has been immediately designated. Almost all the cases mentioned above could have involved simple coincidences (i.e. co-incidences). By random chance, spontaneous events that happen once in a hundred, a thousand, or more cases, occurred exceptionally close together.

On the other hand, there may be a true danger. Remember thalidomide, or talcum powder containing hexachlorophene, or contaminated Spanish vegetable oil, or distilbene (which produced cancers of the vulva in adolescent girls whose mothers had consumed the chemical during pregnancy). There are swarms of examples of public health problems that have been discovered this way. In fact, the outbreak of a cluster is almost always the way we learn about serious and rare effects of exposure to certain risks.

This uncertainty in which we find ourselves trying to distinguish between a random event and the real existence of a risk factor is the ground in which a crisis puts down roots.

Technological accidents fit this outline. Whether there is a real catastrophe or simply an alert, what is being discussed or threatened is the health of great numbers of people. They are calling for rapid decisions, in the first moments following an accident, even though we face many sources of uncertainty about the actual dangers.

P.L.: To help us understand how complex public health decisions are in these situations, and to highlight the specific role played by the public health

expert, maybe we could review some of the cases you've been directly involved in.

L. ABENHAIM: Yes, I'd like to look at two examples. One is the earliest public health crisis I was personally confronted with, first in Canada (following the cluster at the *Toronto Star* I described earlier), and then in France. This taught me a great deal about the expert's role in such situations. The issue was pregnant women working on VDTs. The second example is the fire involving the PCB transformer at Villeurbanne, in 1986. I've chosen these examples because they both represent decisions to be made in the face of risks about which science provides only scanty information. This means science and medicine offer no absolute truth at the time the decision has to be made.

## *Video display terminals*

In 1979, four women working on computer screens in the offices of the daily *Toronto Star* gave birth - within the space of a few weeks - to children with birth defects (a cardiac malformation, a cleft palate, a club foot, and a malformation of the eyelids). Of course this news was soon published by the very same newspaper, and it rapidly became the subject of an important debate.

It is easy to see what was at stake here. We were at the beginning of the office automation revolution, which many people were taking badly. Computers destroyed jobs, they were thought to be inhuman and hard to use. Some health effects of working in front of terminals (e.g. fatigue, eye strain, back pain) had been widely studied and were often used to support demands from labor unions. The birth defects at the *Toronto Star* added a much more serious source of worry, reinforced by the fact that the cases were not isolated.

In light of the vigilance provoked by the *Toronto Star* cluster, twelve other clusters were identified in North America in the following months, involving unsatisfactory outcomes of pregnancy among women using video display terminals, hi one case, among nineteen pregnant women working at a hospital, seven had miscarriages; elsewhere, among twenty female employees in an agency of the US Department of Defense, twelve miscarried or gave birth to abnormal children.

These clusters triggered considerable action by employee and consumer associations in Canada and the United States, who fought to have pregnant women removed from work involving computer screens. The question went as far as the Congress of the United States and public health and occupational hazard authorities in Canada (especially in Quebec). I can cite from memory some of the questions that arrived every day at the IRSST in Quebec: "My wife works with a VDT; she already had a miscarriage last year; should I ask that she be covered by the law on preventive removal of pregnant women?" (from a doctor at Saint-Luc Hospital in Montreal). "This young women wants

a baby; her only skill is word processing; she wonders if she should change jobs. Of course, unemployment being what it is..." (from a general practitioner in Montreal). "An employer wants to force all his secretaries to work on word processors; how can we make him understand that this is dangerous?" (from a labor union in Hull, Quebec).

At the time, we had no data on the effects of computer screens on foetal development. Right away, we thought of the possibility that these screens were emitting electro-magnetic radiation. Teams were sent out to measure the radiation produced by the terminals on the sites where clusters had been observed. The ionizing radiation they found was negligible, lower than background radiation levels. On the other hand, fairly high levels of non-ionizing (low-frequency) radiation were detected.

We knew almost nothing at the time about the effect of these low-frequency electro-magnetic fields (LFEMF) on pregnancy. This is why we were impatiently awaiting the results of the first studies. And the earliest study published, done in Spain, demonstrated that this radiation caused malformations in chicken embryos. The polemic, which had simmered quietly until then, suddenly became much more heated.

As a response to these worries, and to the demand for removing pregnant women (and those planning pregnancies) from work on VDTs, we saw several types of reaction develop.

The first attitude, encountered most frequently among employers, was to deny the danger outright. This denial without supporting arguments reinforced the radical attitude of those who were worried or who wanted to have the danger recognized. The second attitude consisted of denying the risk by applying what I call the poker player's logic. This is worth describing in detail, because it recurs systematically in this type of situation, sometimes rightly and sometimes wrongly. The poker player's logic goes like this: the odds are very slim of being dealt four aces in a five-card hand, but it's normal that it should happen from time to time if you play often. By the same token, if large groups of women work with computer terminals, it's normal that from time to time, some of them (four out of seven at the Toronto Star) will give birth simultaneously to malformed children.

This logic recognizes that the probability of each cluster taken by itself is low, even infinitely low (we can calculate its rate), but since there are many terminals in use (7 million in the United States in 1981), it is no surprise that clusters occur from time to time. This explains how statisticians asserted, in some very reputed scientific journals, that clusters of birth defects like those at the Toronto Star could be normally expected to occur two or three times per year, and that clusters of spontaneous miscarriages could be expected more than 100 times a year among women using VDTs.

This argument wasn't convincing. As you can imagine, it was hard to accept for the people who felt personally concerned, and furthermore, it was only valid if it could be supported by solid data. As it turns out, though the logic was good, the calculations themselves proved to be totally wrong. We later demonstrated, for epidemiological reasons that are difficult to explain

simply, that a cluster like the *Toronto Star* should only occur once every 25 years. At most, the clusters of miscarriages, which are spontaneous events more frequent than birth defects, could be expected to occur four or five times per year in the United States, but not 100 times, as the first estimations asserted. You can understand the women concerned were wary of cut-and-dried answers telling them, "This is normal." They had common sense on their side, against too hastily produced statistics.

The third attitude, and no doubt the most frequent one, was to avoid denying the risk, while at the same time refusing to admit the possibility formally. This explains why no clear policy was to be pronounced by public health authorities or occupational hazard officials, either on a national or international level. The World Health Organization, for example, recommended insulating the machines - while indicating that there was probably no hazard involved.

As for the scientists, they stated broadly that they didn't have enough data to formulate an opinion, and proposed to organize research on miscarriages and birth defects - which was promptly interpreted to mean that there was definitely a hazard. Slow and cumbersome studies were developed progressively.

But what to do in the meantime? Left to their own devices, practitioners and doctors decided as they saw fit, and naturally this created contradictions from one clinic to another. In Quebec, for instance, the Quebec community health departments often favored preventive removal of secretaries working with computer terminals. Many doctors also authorized sick leave. But others refused. Gradually, a great deal of confusion set in.

P.L.: What should have been done?

L. ABENHAIM: To deal with the birth defects, the possibility of a hazard should have been admitted already in 1979, since there was absolutely no argument to rule it out. Public health authorities should have stated, "We don't know if the terminals are responsible. We don't have any scientific data indicating they are, but we can't eliminate the possibility", and they should have set up quick and powerful epidemiological studies of the question. Under those conditions, if the necessary means had been provided, an answer could have been found within three months. Curiously enough, the very rarity of birth defects makes them easy to study, if you are willing to devote what it takes. But even discussing such a study caused a general outcry.

We did eventually have to organize studies, but they were less well adapted, so that the results weren't available until 1986, seven years later. They did eliminate the VDTs as a source of the malformations. But an adequate study could have been done earlier, if the authorities in the countries involved, along with employers and scientists, had been willing to admit the clear possibility of a risk.

P.L.: How was the crisis finally solved?

L. ABENHAIM: The case still isn't closed, though it has become less explosive. To the contrary, the debate has spread far beyond North America. In 1986, British labor organizations called for the removal of all women

planning pregnancies. That same year, there was an international scientific colloquium in Stockholm on the matter. The tone of the public debate there became extremely sharp. Shortly thereafter, it was rumored that the Swedish government had cancelled all orders for new terminal equipment. And yet the 1986 publication of the very reassuring results of epidemiological studies should have made it possible to offer a response, at least about this most disturbing topic (as for the miscarriages, no study could offer conclusive results, as many women do not even realize they have miscarried, since it happens when they are still unaware of the pregnancy).

But in some countries, the findings arrived too late. In Canada and the United States, people had come to mistrust scientists, after the errors made by some of them, which I mentioned earlier. This means is that those who are fighting to have a danger from computer terminals recognized, are still not convinced by the epidemiological results.

In France, as soon as the question was raised by nationwide labor associations in 1986, INSERM (the National Institute for Health and Medical Research) created a working group that took a formal stance as to the absence of a risk of birth defects (we had access to the findings from the studies I mentioned). We talked about these results with the leaders of all the major French labor unions on a national level, and with occupational physicians from the large firms concerned by the use of terminals. I think that helped prevent the debate from getting out of hand. The discussion between our working group and the labor representatives proved to be very instructive, especially insofar as the findings about miscarriages were concerned, because these were very difficult to interpret. In a word, this is the conclusion we reached: it would take a very large study to reveal an excessive risk of miscarriage, if such a risk existed; it was impossible, based on the studies available, to disprove or prove such a possibility. But even if the latter scenario were true, we already knew that the risk was remote, and in no way sufficient to justify removing millions of women of childbearing age from work on video display terminals. With that, it was easy to reach the consensus, at the time office automation was getting under way, that the risk of discrimination against women was greater than any potential risk from the terminals.

For me, the case of VDTs is a very interesting model of how a mini-crisis can build up around a public health issue. It has led me to several conclusions on how an epidemiological expert should approach this type of situation:

- Whatever your personal conviction may be, do not deny the possibility of a danger if you don't have rock-solid arguments. While awaiting scientific arguments, you must look for a social consensus as to the interim measures to be taken. The greater the uncertainty surrounding the risk, the more explicit your policies must be.
- Respond immediately to the concerns expressed, by setting up short-term studies that can provide efficient answers to the questions. An epidemiological study on birth defects like the one on VDTs published in Finland in 1986 can be put together and completed in three months. Something similar to this was

done in Alberta, in another situation I talked about at the beginning, when Dr Spitzer worked with a very large team to solve a crisis. In a few months, people's anxieties had been relieved. Obviously we can't do this every time there is talk of danger - the means have to be proportional to the end. In North America, the importance of apprehensions about computer terminals justified the effort.

- Do not pretend that science can answer all the questions. We knew here from the very start that the question of miscarriages couldn't be answered scientifically. This meant a social consensus on the extremely miniscule degree of risk had to be reached (which is what we did in France).

- Be wary of hastily prepared statistics (and I speak as an epidemiologist and an amateur of statistics). The fact that three different highly qualified teams (one English, one Swedish, and one American) erred in the same direction proves just how careful you have to be in interpreting figures in a crisis situation. (Their computational error was identified by cooler heads in France, when there was no real crisis under way on the subject, and it was trivial.)

## *The Villeurbanne Case*

P.L.: How did you become involved in this other matter?

L. ABENHAIM: Via television. After the two fires that hit PCB transformers, there was a great deal of coverage in the national media - the cloud of smoke over Villeurbanne, a thousand people kept out of their homes, the political celebrities in the limelight. The whole thing had become highly dramatized. I went on-site, as a scientist, to learn what I could. I thought it was all over. I was surprised to learn during a meeting held at the prefecture the day after the second fire that there was talk of evacuating another thousand people.

P.L.: Did the risk justify such a move?

L. ABENHAIM: No. PCB s do not represent what we call acute hazard, and furans, the substances that can be released by their combustion, are not produced in sufficient amounts to put people's lives in jeopardy. So the panic triggered by these fires was absolutely unjustified. More specifically, there is almost never production of Seveso-type dioxin, contrary to the headlines in the press after Villeurbanne. This was not a major hazard situation. Not that we could dismiss all potential for risk. But from a public health point of view, the crisis itself could be harmful.

First of all, you should know that under certain conditions, the furans produced can cause skin lesions. While these don't present any objective danger, they can be very unpleasant. They cause what is called chloracne, i.e. skin rashes on the face, torso, and limbs. This contributed largely to the tension created by the accident.

Furthermore, these substances are carcinogenic in animals, and according to the International Agency for Research on Cancer (which just happens to

have its headquarters in Lyons), they may have the same effect on human beings. What can you reply to the question that is bound to be raised: "Can you certify that these substances are not carcinogenic?" What is difficult to explain in an emergency is not so much the reality of the danger but rather the impossibility of ruling it out. This is what generates anxiety as well.

We had to make decisions aimed at avoiding any outbreaks of chloracne and at limiting any residual exposure. The difficulty lay in the fact that the smoke had covered a wide area, and it was hard to know where the soot had come to rest. Our decision also had to take into account the anxiety that was inevitably raised by the fuss over the fire, the dramatic atmosphere I described, and the references made to dioxin in all the morning newspapers. The psychological damage was done: some 495 people went to Edouard Herriot hospital to be examined, which goes to show that they considered themselves implicated and were doubtless worried.

There is a common temptation to evacuate everyone and make decisions later, especially if you have to wait for laboratory analyses. The question was clearly stated by the local government. This type of measure offers several advantages: it gives the impression that the people in charge are taking no risks, it avoids awkward explanations, and it plays very well with the media. This is what many decision-makers do in cases involving chemical accidents, when they can't confine people to their homes.

Aside from the fact mat they are not easy to carry out thoroughly, these large evacuations are often the source of a series of perverse effects, of which you have to be aware.

First of all, it's easier to decide to evacuate than to decide afterwards what the criteria are for letting people return to the area. In another case involving an accident with a transformer in Rheims, occupants could not return after the evacuation, and they lost everything. It took five years to reoccupy a building in Binghamton, New York (the most severe case on record of contamination following a transformer fire). I wouldn't like to be kept out of my home very long without a good reason.

But to return people to an area, you have to demonstrate conclusively that there is no further risk (otherwise, what was the point of evacuating in the first place?). When you are dealing, not with volatile gases, but with substances with a high surface tension, that accumulate easily, as was the case here, the contamination may be lasting. So two things are required: (1) getting public health authorities to provide a definition of the threshold at which the risk "disappears", and (2) taking measurements in all the evacuated buildings to see whether they are above or below this threshold. In other words, there is weeks and months of work. And it becomes clear that 99% of the buildings will have been evacuated for nothing, if that step is taken without circumspection, i.e. without knowing where the soot has accumulated. As a result, hundreds of people will have suffered pointless discomfort, not to mention the other costs (not only financial) of the operation. Then again, finding out exactly where the soot has landed and whether it is dangerous will also be time-consuming.

Last of all, every measure involving large population groups has epidemiological consequences that should be clearly recognized.

For one thing, there's the catastrophe syndrome. Epidemiologists are now well aware that the stress created by a catastrophe is the cause of an increased morbidity in the populations in question. It doesn't necessarily take a spectacular crisis to produce this syndrome: at Seveso, where the original accident went unnoticed, there was an excessively high incidence of deaths from myocardial infarcation in the following weeks and months, no doubt because of the panic generated by the news and the measures taken as a result.

There is a second aspect of this catastrophe syndrome. It makes people more conscious of the state of their health. In particular, a series of pathologies are brought to our attention in the days following the incident that normally would only have been diagnosed progressively, or remained unnoticed. This distortion becomes the source of numerous difficulties in some situations (for example, an increase in the number of miscarriages is observed).

Third, we're very familiar with the psychosomatic *effects* of these situations.

Another perverse effect derives from the very nature of medical statistics. This is probably the most difficult aspect to manage in post-accident situations where there is a great deal of controversy over the actual effects. If you evacuate 1000 people, there may be some twenty pregnant women among them, and a few will probably miscarry. There will be cardiac incidents in the following months (perhaps a dozen within a year), there will be cancers, and so on. The greater the number of people involved, the greater the corresponding number of pathologies (if 10,000 people are evacuated, for example, there may be 30 miscarriages). At Villeurbanne, out of the 495 persons examined by the poison control center, 30% presented "abnormal" blood or serum conditions (it had to be proved that these problems were due to tobacco or alcohol or to the fact that the blood samples were not taken according to standard procedures).

All these elements have to be weighed together in making a decision, and you have to be ready to handle the consequences, both in medical and epidemiological terms.

The problem would be extremely simple if, on the one hand, we had some time before us and, on the other hand, we could know what the levels of contamination were at the time the decision had to be made. By definition, though, decisions have to be made rapidly, and the analytical laboratories are absolutely incapable of producing reliable results within a few hours for substances like furans (it took a week at Villeurbanne to get analytical results).

In the case of Villeurbanne, I advised the local government to take two measures, after checking with two other experts to be sure they were justified (one expert in Paris and another on site - this double point of view is important). The first measure was to evacuate the dwellings in which there was soot, whatever its source might be. In other words, we had to take

inhabitants at their word if they declared that the soot had appeared recently and not take into account the presence or absence of dangerous substances. The other measure was to distribute information about potential contamination of vegetable gardens and yards, and advise people not to eat home-grown produce. The only worry I had was about contamination of children's playgrounds from smoke deposits (as furans apparently accumulate very easily). Children have pica-related habits (they will put almost anything into their mouths). Their body weight is obviously much smaller than adults, and they are generally more sensitive to PCBs and furans. So we provided information about potential contamination in gardens and advised parents to avoid their children's consuming anything from the playgrounds in question. Obviously this was not without a certain psychological impact, but studies of previous accidents seemed to indicate that chloracne might be caused by eating contaminated food.

A system was also set up at the poison control center to provide medical follow-up. The appeal reached a very broad audience, broader than could be controlled, as events were to prove: in the following days, 495 persons came forward, which is a lot, and which proves people were apprehensive. For them, a hazard did exist, and I think we were right to take the measures we did.

We had to outline an epidemiological means of verifying the situation: we identified two groups of 36 representative individuals from among the most exposed and least exposed groups that came forward for the medical exam, and we performed a comparative study in order to evaluate the specific effect of exposure according to different parameters, including blood levels of PCBs.

P.L.: Could anyone reproach you with these decisions?

L. ABENHAIM: They did, on both sides of the issue! In Italy, where I explained my reasoning, the experts told me that I should consider that these accidents were 50 to 60% as serious as Seveso, and that they should therefore be handled accordingly. Others said there might be furans and PCBs even where there was no soot. I think treating those incidents like mini-Sevesos would have created more problems than it could have solved. The cure would have been worse than the illness. In contrast, those in France who didn't believe there was any risk indicated that the probability of finding furans was remote, given the type of PCBs involved in the fire. And in fact, laboratory tests published later revealed very low furan levels. But in other accidents involving liquids similar to Villeurbanne, significant amounts of furans were produced. So I don't believe you can make a public health decision on the grounds of small probability if you aren't capable of providing precise estimates. Those who allege (and even write) mat they had foreseen there would be no toxic furans are behaving just like someone who wins at heads-or-tails and says, "I told you so." It isn't very meaningful, and it's even dangerous. And even if there are only less toxic furans, go explain to people that "there are 1, 2, 3-trichlorodibenzofurans, but rest assured, we think that they are less dangerous than 2, 3, 7, 8-tetrachlorodibenzofurans!" And you

should note that we often neglect the presence of PCBs themselves. Here, the analyses performed a week later proved that there were large amounts.

Certain writers have stated that the Villeurbanne experience should teach us to be less hasty in the future. That may well be true as far as the contamination of the water table is concerned, but it's easy to say so after the fact. There are a lot less volunteers for Russian roulette than for the state lottery.

P.L.: What do these two cases have in common?

L. ABENHAIM: I chose these two examples because they illustrate the kinds of choices facing public health practitioners more and more today. We have to make decisions in environments full of uncertainty. Worse yet, the problems are posed in scientific terms (e.g. risks, toxic effects), but science is in fact unable to provide formal answers.

There are more than 60,000 commercially available chemical compounds, and 1000 more hit the market each year. We have knowledge of the acute effects of some of them, but we only have epidemiological data on the long-term effects of a few dozen, less than a hundred of them. It takes years to study a compound sufficiently and to understand its chronic effects on human beings.

Animal experiments have been done and have revealed teratogenic or carcinogenic effects, under conditions that are incomparable, in terms of either dosage or exposure, to the conditions encountered by human beings. At those levels, you almost always find some effect in animals. On the other hand, some substances are carcinogenic for humans but not for animals.

Should we wait for proof that a substance is dangerous for humans, or rather, in the absence of proof that it is innocuous, should we assume there is a hazard?

For the public, we understandably have to take the fewest risks possible, but the dilemma lies in the fact that these decisions themselves are not neutral or risk-free. To cite the examples I've given, banning work on VDTs for all women of childbearing age would undoubtedly lead to unemployment problems, with non-negligeable consequences that can also affect health. If nothing else, declaring that working on computer terminals was dangerous would lead to job-site discrimination, in an age when computers are ever more commonplace. In the same way, thousands of people cannot be evacuated without a certain amount of stress, and without re-entry problems. What's more, recent incidents in France have shown that large-scale evacuations are very difficult to carry out.

Often, populations are exposed to a hazard through an accident, or during the introduction of a new technological procedure. Under these circumstances, that means there is practically no scientific knowledge about the conditions created by exposure. In other words, the expert's evaluation is based on judgment and on an interpretation of the data, which necessarily leaves a wide margin of uncertainty. The expert is called on to make none other than an educated guess based on the information available.

Making a public health decision is something neither technical nor truly scientific. It's more like the obstetrician who must choose between a caesarian and a breech birth without knowing exactly which is the better solution. This is where operating know-how, an epidemiological sixth sense, and a knowledge of the distribution of morbid phenomena in a given population can all play a crucial role.

PIERRE BOBE AND JACQUES FOURNIER

# In a crisis situation, unions are vulnerable, too

## Background

Shortly after the Bhopal catastrophe in December 1984, the region of Béziers in southern France was shaken by emotional turmoil involving "La Littorale", a Union Carbide plant located there. This plant used MIC (methylisocyanate), the very product that had caused the massacre in India, in the production of the insecticide Temik, and 50,000 liters of the chemical were stored on-site. Of course it was kept in relatively small (180-liter) drums and not in a vast reservoir, and of course everyone insisted that safety measures at the plant were draconian. But doubts had been raised before. There had been poisoning problems within the plant in 1977, and with 17,000 people living in the environs, the closest residential areas were not far away. No specific attention had been paid to the way the drums were transported to the plant from the port at Fos, near Marseille, after being shipped from the United States. Any discussion between the 450 people working at the plant, in an area stricken by severe unemployment, and those calling for the plant's closure, was bound to be tense.

This case is an interesting starting point for examining the way unions behave in the post-accident period. To launch this discussion, we interviewed Pierre Bobe, federal secretary of the CFDT union, and Jacques Fournier, CFDT's delegate to the higher council on dangerous installations.

## *The case of "La Littorale'"*

P.L.: What were the key moments in the La Littorale case for you, and for a start, how did you come to be involved in this matter, since you are outsiders to the area?

P. BOBE: The crisis around Béziers developed during the months after the Bhopal catastrophe. The union became involved at the national level in February 1985, when I got a phone call from the secretary of the local union: "The chemical federation has to take a stand, because we're having problems with the section at La Littorale on the issue of plant safety." Until then, we hadn't had any reason to get involved. I should also mention that during the

actual Bhopal crisis, we were holding our trade union congress down near Montpellier, so that wasn't really the best moment to begin tackling the problem. So at that time we hadn't developed any special contacts with the union in the area in question. The first key moment came on February 22, when I had to go down to Béziers to try to clarify the debate and get discussion going among the different points of view within CFDT. Let me go into a little detail on this episode, because it's the most enlightening aspect of the case.

All the contradictions that were present in the region were mirrored within CFDT, from the most determined advocates of plant safety (i.e. the workers at La Littorale) to the most ferocious partisans of plant closure (including members of other CFDT unions, like the social security or postal employees' unions), and other groups with more moderate positions in between (such as the firemen). Within a single organization, there were strongly opposing forces, against a backdrop of general confusion.

J. FOURNIER: You have to realize how explosive the situation was. Every day there were articles in the press, with photos taken using a zoom lense that made it look as if people's houses were right up against the plant when they were actually a few hundred meters away, and so forth. As is so often the case in this type of situation, this context was aggravated by secondary questions, like the issue of temporarily starting the plant up again (it had been stopped after the Bhopal disaster) in order to use up the stocks of MIC, whose presence could no longer be tolerated by the local population.

P. BOBE: At the federation, we wanted to see the problems and the issues clearly identified. We didn't want to simply give in to the ecologists: there was a serious unemployment problem, and we couldn't simply take a stand on principle for the closing of the plant without having a closer look. Or else you could just as hastily close half the chemical installations in Europe, by arguing that there's always the risk that a plane will crash-land on them, or some other hypothetical accident will take place. But we also didn't want to yield to the very reassuring noises being made by our comrades at La Littorale. Because they were so worried about keeping their jobs, they had a strong tendency to shut off all discussion — though even for them, this was a grave error, since by behaving that way they simply made people even more suspicious.

Our position was that we had to defend the principle of keeping the plant open, but on three conditions: 1) an in-depth safety study had to be made (this was indispensable, because everybody was talking about this and that without really knowing where things stood); 2) a program for both technical and financial safety had to be drawn up; and 3) the transportation system from the Marseille port to Béziers had to be completely overhauled.

But it was hard to get the discussion rolling:

- The people who wanted to "reconvert" the plant (i.e. the local elected officials) had what looked like common sense on their side. But this very

attractive solution was also somewhat hypocritical, since there was nothing behind it. You don't reconvert a plant by magic, and we wanted details.

- Those who wanted to close the plant (the ecologists, neighborhood associations, and certain CFDT unions) had an argument that was hard to beat: "The plant management has already lied to us in the past, when it began using MIC in 1977 and was asked how toxic the chemical was, so there's no reason to believe it will stop lying now."

- The people who wanted to keep the plant open, and who tried to minimize the hazards while refusing to enter into a serious discussion of the safety issues, simply strengthened the hand of the partisans of plant closure. They also tended, like their management, to refuse outright any study aimed at modifying the industrial process. Actually, that was the solution that was finally adopted: they stopped importing MIC and began using another compound.

I tried to reconcile these different factions, by telling some, "You're exaggerating things", and others, "You can't ignore the hazards, you have to put all your cards on the table. On the other side they're exaggerating the problems, but you're only reinforcing their suspicions." There was no way the plant could be kept open unless there was a clear discussion with everyone who was frightened by its presence.

To come to grips with the very large problems that the plant posed - which ran much deeper than union issues - we called for the creation of a sort of health and safety commission for the city of Béziers. It brought together managers, elected officials, associations, plant workers, ecologists, and so on. The crucial point was that these different parties could receive information and talk together. Because in this type of situation, you have to be careful that for want of information, people's fantasies don't overwhelm the discussion.

But the February 22 meeting alone wasn't enough. It took other meetings and a whole series of small steps, such as the safety report that was commissioned by the Ministry of the Environment.

## *Beyond Béziers*

P.L.: Now if we move away from the Béziers example, what observations would you have to make about the position of a union like yours during an acute post-accidental crisis?

P. BOBE: Within the unions, you have to realize that there can be a gap in the way the problems are perceived at various levels. That was certainly the case at Béziers, or more recently around the reactor at Creys-Malville. We saw the same situation with Kléber Tires, when the consumer magazine *Que choisir!* launched a campaign denouncing their products as unsafe. Some

people defended Kléber, others were more convinced by arguments coming from the outside. As you can see, we can very quickly find ourselves between a rock and a hard place as a result of statements made to the press, local conflicts, and differences in positions taken by the local section and the federation.

P.L.: Do you think you might find yourselves "on the front" some day during a crisis?

J. FOURNIER: The obvious answer would be that since we aren't in a decision-making position, we would never have this problem of having to manage a crisis. As a general rule, we have it pretty easy. We can always protest because the preventive measures taken were insufficient.

But we might find ourselves in possession of a single piece of key information that the local government or the plant director didn't have (simply because our network of unions operates at top speed), and at the same time, we might be called on by the press to speak out, which is an accepted practice. You have to understand that our star-shaped information networks often function much better than hierarchical ones. For instance, during the Port Edouard-Herriot fire, the personnel from the national railroads called me - they didn't call the prefect - because I belonged to their union, because they know me, and because I'm a technician, too (that's very important: we share the same background). On this point, by the way, what really counts are the relations you've developed before the event strikes. If there's a problem, the press systematically calls up CFDT, because the journalists know that this union will give them specific technical information and not just a political position.

Given that state of affairs, there's no denying that we could become caught up in a crisis. So you have to be careful of what information to give out and what to preserve. In the case of the Edouard Herriot port fire, for example, what would have happened if we had told a journalist who called, "Look out, there's propane right close by, and if it blows up, there will be piles of dead"? If in the midst of all the excitement, we repeated what we had just learned from a buddy who wanted to inform us, without thinking about the weight of this information or the fact that neither the local government nor the firemen were aware of it, I can guarantee we'd be on all the radios within ten minutes. This isn't a matter of pure speculation. Generally speaking, we do sometimes find ourselves in possession of a very specific piece of information that the prefect doesn't have, and which might be vitally important at a given moment. In particular, we know better than the firemen what chemicals are where at any given moment. Industry is a living system, and it doesn't always follow the pre-established plans to the letter. There are a lot of instances in which the firemen would have had some nasty surprises if ever there had been an accident. But our information could also very well be false. We might not be in a position to verify it. And there are still other problems: what do you do when a worker has secretly confided this

information to his supervisor? How do you manage collective decision-making - which is the way unions are supposed to work - when public action has to be taken very quickly by a few, or even a single person? And what kind of entrees do we have to the local government system? Generally speaking, none: the unions are not consulted in drawing up emergency plans.

P.L.: To tell or not to tell, whether or not to establish relations with the authorities when that isn't part of your functions - those are questions that could thrust you into atypical roles for a union leader.

J. FOURNIER: That's right. But we've been lucky until now, and we've never been thrust brutally into the limelight. If that ever happened, we could quickly find ourselves in the same position as the people in charge. We would run the same risk of seeing our credibility evaporate at the slightest error. Simply because we had been misinformed, for instance.

P.L.: For the time being, what landmarks do you bear in mind to guide your actions in this type of situation?

J. FOURNIER: I would prefer instead to speak of warnings:

- Don't let yourself become mesmerized by the media scene. This goes for everyone, but the union leader has to pay more attention than anybody else. People who don't often have access to the media are tempted to take advantage of a situation to make themselves heard - when they would do better to shut up and check their sources. But we know that journalists are fickle. They just might not call back. Knowing this, we give them an answer, and that's a mistake. To the contrary, it's absolutely necessary to say that we'll check our information first, and ask them to call back later. Even at the risk of not hearing from them again.

- Don't get caught up in the whirlwind of emotions. In a crisis, public emotion exerts such a force that everyone, even unions, must be careful not to add fuel to the fire. For instance, during the crisis with Bhopal and Béziers, we had to deal with the problem of three drums of MIC found in an installation near Lyons. The company very rightly proceeded to destroy the product, after obtaining the necessary government authorizations and taking all the appropriate precautions. We didn't publicize the issue. There had been no danger, everything had been done according to the rules, and it would have been very unfitting to fan the media fires even further because of a non-issue. To understand how important it is to be prudent, you have to examine the kind of difficulties that are inherent in a crisis. Because of the shock, it's difficult to get any kind of rational ideas heard. People develop fixations that prevent them from using any technical reasoning. Because basically, a catastrophe seems first and foremost to be a technological failure, and with that, people are very likely to resist anything relating to technology. It becomes absolutely impossible to point out that from a broader point of view, MIC is probably less dangerous than chlorine, which is handled in tremendous quantities. Announcing that three drums of MIC have been

destroyed without incident would simply add to the general confusion and could provoke bad decisions - which would create other hazards.

- Be aware of the biases different groups bring to a situation. People who are far removed from technology are very likely to be subject to anxiety - and the further they are from the industrial world, the greater their anxiety will be. But in the same way, the bias can run in the other direction. Those who work day in and day out with a chemical will tend to minimize the hazards. They quickly latch onto the idea that there are safety measures. And that can be vital for them: how can you live through the day if you keep thinking, "If I turn my valve the wrong way, I'm going to kill so many hundred people on the outside"? Along the same lines, you should note that union leaders are fundamental believers in the industrial process. An accident is a failure for everyone, including the union leader. Employees will tend to close ranks with their management. In some companies, it's even frightening... And the more the company comes under attack, the stronger the defensive reaction becomes. In addition to these fundamental behavior mechanisms, it's probably necessary to consider aberrant behavior which can be explained by the situation. Under such circumstances, people may begin to imagine things, even employees who seemed to have accepted the hazards. They may have been worried for a long time and have built up an imaginary scenario, and with the shock of the event, they imagine the scenario is being played out.

- Don't forget that a union is an organization with the problems of any organization. The more serious a problem appears to be, the less information on it will circulate. This means it's important for us, too, to train our members, before the event hits. The classic case in point is making a statement after an accident. Who should do the talking? A journalist could interview an untrained union member, who might make statements under stress, in the light of this failure, that would be impossible to retract later on.

- Don't forget that after the crisis, the systems have to go on working. You have to be careful not to resolve a crisis without paying specific attention to technical issues. Because as the crisis fades into the distance, what remains are the technical issues. You don't want to find yourself stuck with a completely ridiculous technical solution, which will actually end up causing not only serious economic problems, but real safety problems as well. An apparently simple solution may simply shift the danger around: if you replace a gas with a powder, it shifts from the outside onto the workers; if you change the transportation pattern, it shifts from one place to another. You musn't lose sight of the fact that one day, the crisis will be over, and then everyone will have to live with the decisions that have been made.

ROBERT L. DILENSCHNEIDER

# Ethics and competence for crisis management

## Background

Hill and Knowlton, Inc. is a public relations company operating on a worldwide scale. Its organization includes at least 56 offices in North and South America, Europe, the Middle East, Southeast Asia, Australia, and New Zealand. It offers services in the field of communications - which include crisis communications and provide specific tools such as satellite channels and TV-linked conferencing. The company's clients range from public organizations to private corporations and trade associations, and from non-profit institutions to labor unions and consumer groups. Robert L. Dilenschneider has been president and chief executive officer of Hill and Knowlton since 1986. He is the author of a manual on public relations (see bibliography in appendix) and has taught in various universities such as New York University and the University of Notre Dame. We spoke with him in New York in August 1987.

P.L.: Based on your experience, how do you see crisis management?

R. DILENSCHNEIDER: The good crisis manager does not let his crisis become public when it is reasonable and possible to hold its impact to the minimum. But he has to be prepared to deal effectively with all the publics involved when the crisis is beyond control.

Take an air transport crash as an example. Many categories of people are affected: there are the passengers who are hurt or killed, along with their families and acquaintances; there are regulatory and political authorities who must be dealt with for legal or diplomatic reasons; all those with a stake in the company must be kept informed, such as stockholders and employees; customers have to be not only informed but reassured as well; the press, with its insistent and voracious need to inform the public, must be met forthrightly and satisfied.

In each instance the facts and emphasis in communication may differ, as will the persistence of interest in the crisis. The press wants the facts immediately, as does everybody else. But politicians and regulators will be concerned, perhaps, for years. Employees' interest will linger for a long

time. In fact, some studies show that they have enormous psychological problems following a tragic crisis.

The good crisis manager must assess the importance and nature of the interest of all such groups, both immediately and for the future. He must work out a strategy accordingly. And it will become evident only in time how well he has performed. Only afterwards can one measure how a crisis has been handled. Do employees leave? Have customers abandoned the ship? How have stock prices and market share reacted? Has the crisis led to additional laws or regulations? To me, these are important criteria.

P.L.: What do you think of the "right" crisis plan?

R. DILENSCHNEIDER: Many people like to say, "Here's my crisis plan." Forget it. The crisis plan never works. What is needed are people skilled in dealing with crises and who have a feel for the social, political, and economic dimensions of their country, their city, their continent, their world. Such people are able to adjust very quickly within that framework. Such people should be skilled at handling other people, such as the media, the inhabitants of the political environment, and employees from entry level to the executive wing. The good crisis manager is always training people how to deal with a crisis.

Let's look at a good case and a bad case. A chemical company that I will not name had a serious crisis. It had had 70% of a particular market, but after the crisis it plummeted to 30%, a tremendous loss. It cost the company $40 million to recover that market share. To me, that is an example of a crisis that was not well handled.

In a Gerber Food crisis, where the company had unwittingly gotten bits of glass into baby food jars, the company's 80% of the market dropped to 65%. They spent only a couple thousand dollars getting their market share back. That is a good example.

P.L.: What was badly dealt with in the first case?

R. DILENSCHNEIDER: Amateurs rushed into the public domain with more information than they needed to communicate. As in many cases, I think managers created more of a crisis than there was in the first place. Rather than dealing in a straightforward way with the politicians and regulators, rather than getting the story to the press, they continued raising problems.

A good technique to consider in a crisis is to tell all those concerned something like this: "To recover from this crisis, there are ten things we need to do." Then you list them. Every time you get one of them accomplished, you declare a partial victory. Finally you get to ten, and the concerned people are satisfied because you have pulled them into an understanding of the process and an appreciation of the progress.

P.L.: Is there a particularly amateurish way of dealing with a crisis?

R. DILENSCHNEIDER: The world is populated with amateurs. The amateur tends to speculate, which is dangerous in a crisis. He tends to move faster than he should, not stopping to think through the consequences, not taking into account the audiences which should be considered. Take Chernobyl as an example. There were enormous implications for the vodka business in

Poland; for the lettuce business in Germany; for the nuclear power industry in Texas; for workers in nuclear projects everywhere; on the USSR's foreign relations. The amateur is the person who does not take such considerations into account.

P.L.: To cite a specific example, was it good or bad for Warren Anderson, the president of Union Carbide, to go to India after the Bhopal catastrophe?

R. DHJENSCHNEIDER : It was smart of Mr. Anderson to go to India, except that he did not take the right steps before leaving. It was amateurs who prepared him for his trip to India, and that is why he was arrested. He should have gone there with the attitude of having people join hands to solve the problem together. Instead he went to India to investigate the problem, and he got arrested.

P.L.: He probably should have established contacts beforehand with the Indian government.

R. DlLENSCHNEIDER : Definitely. It should not have been hard to do that.

P.L.: Don't you think that generally, in a crisis, even top-level managers do not know how to cope?

R. DlLENSCHNEIDER: The inability of executives to come to grips with this kind of problem has caused many crises to become bigger than they are. Generally most people try to figure out how to hide. They do not want to be blamed. The strong people in a crisis are the ones who emerge to say, "I will take responsibility, and I will do something about this." There are not too many who do that. Most try to get away from responsibility because they know their careers and families' security are on the line; their own reputations can be compromised.

P.L.: How do you explain the reticence of corporations to consider the possibility of crisis?

R. DlLENSCHNEIDER: Corporate offices are under such pressure to perform financially that they are often unwilling to invest the time and thought necessary for crisis preparation. When that's the case, the occurrence of a crisis can be the end of the corporation. The smart manager should devote part of his time to crisis communications. He should require of those reporting to him that they give some attention to the matter. And their progress at work should require improvement in their ability to handle crises, as shown by their comprehension of training in crisis communication. Often, there is no training, no requirements, no reports to the senior officer - although preparing staff for communication during a crisis is not that difficult. People simply do not pay that much attention to it. But they should.

P.L.: But don't you think that there is a general feeling that whoever becomes involved in a crisis - even if he succeeds in resolving it - is necessarily going to have difficulties in his career?

R. DlLENSCHNEIDER: On the contrary, I think that if he succeeds, it should be very good for his career.

P.L.: Nevertheless, there is the idea that the less you get your feet wet, the better it is for you.

R. DILENSCHNEIDER: I understand that - unless you help solve the crisis. If you do, I think it helps your career.

P.L.: All the same, I wonder if even successfully resolving a crisis wouldn't potentially be a source of trouble for those involved: in the course of that experience, they would have come to know the underside of their corporation, those fundamental elements that no one is supposed to know. From that point, they run the risk of being pushed aside. And that risk is also frightening: people believe that it's a no-win situation, whether they succeed or fail.

R. DILENSCHNEIDER : I still think that when a crisis occurs, it is up to the manager with courage to step in and do something about it. Managers should get involved in crisis planning and training. If they will not, they should not be managers.

P.L.: Do you think that a corporation in crisis can cope for itself, or does it necessarily need help from the outside - from a company like yours?

R. DILENSCHNEIDER: Most corporations cannot deal with crises by themselves - not because their people are not good, but because all the different publics that have to be dealt with, and all the places in the world that must be reached, require many more resources than any single company has. For example, we often use the satellite in case of crisis. Most corporations do not have access to a satellite. We have 56 offices around the world, and in many cases, we put all 56 into action. We also have political connections in Washington, London, Paris, Canberra, Bonn... In most cases, corporations do not have that kind of access. In the United States, we have political connections in every one of the 50 state capitals. It is important for corporations to have access to outside resources at a time of crisis.

P.L.: During a crisis, there are of course technical and organizational problems. But the worst is when you run into a true black void, where no one knows what to do next. How do you handle that kind of problem when you are confronted with it?

R. DILENSCHNEIDER: In a crisis, you have to sit down and say, "What are my objectives, my strategy, how do I get there from here?" Most people do not do that: they simply act, and they mistake action for results.

P.L.: But how do you help people deal with crises that are completely outside the realm of their experience?

R. DILENSCHNEIDER: You create scenarios. In most of the cases I have been involved in, we created dozens of scenarios of what happens if X occurs, and how to deal with it. We develop plans for each scenario. This is very effective. Normally, we isolate a crisis team and set them apart from the crisis. We feed them the facts that are occurring and then constantly create scenarios.

P.L.: And do corporations accept this sort of approach?

R. DILENSCHNEIDER: No, rarely. It's too expensive for them; they do not want to do it. But when they do, it always solves their problem.

P.L.: Would you say that there is a growing contradiction in the fact that as the world becomes more and more complex, institutions and organizations,

on the other hand, are failing to develop the capacity to anticipate, to take initiatives, and to look at the long-term future?

R. DILENSCHNEIDER: I agree with you completely.

P.L.: What is to be done? Generally, people refuse to participate in crisis management training.

R. DILENSCHNEIDER: The good news is that that is what makes our business go well. Without their own corps of trained people, corporations call on us. The bad news is that people are not developing their skills through crisis training. That is the real problem.

P.L.: How do you deal with ethical and political problems?

R. DILENSCHNEIDER: If there is an ethical problem, you have to cut right through and begin practicing good, solid ethics right away. That is the only solution. If somebody is unethical, you have to tell him to change or resign. There is no alternative.

P.L.: Are there situations in which you have not been able to work, because people refused to understand this kind of prerequisite?

R. DILENSCHNEIDER: Yes. In South Africa. We were sent to the South Africans many, many times. "If you are willing to accept our recommendations, we will work for you", was our response. But they would not listen to us. There are many other examples. We have often been asked by people to break the law. You can't do that, even though it accomplishes the objectives. It simply cannot be done.

P.L.: And don't you sometimes run into ethical problems of your own in your work?

R. DILENSCHNEIDER : Those are no problem, because from my point of view, there is only one position to take: the ethical one.

P.L.: My point is, say you have an agreement of confidentiality with a corporation, but you learn of the existence of a risk that the corporation does not want to make public. If you remain silent, you could later be asked by the press or the state why you did so. On the other hand, you are bound by your contractual obligations.

R. DILENSCHNEIDER: I have never had a problem with that. I suppose somebody who needed the money would have a problem. Even if the clients insist that they don't want to say anything, I tell them they have to. And if they will not, I say, "I cannot help you." This is a matter of ethics. If it were a question of business judgment, that would be a different story.

P.L.: Yes, but then you could be asked, "Why did you stop there? Didn't you have an obligation to make the problem public?"

R. DILENSCHNEIDER: In that case, I would say, "Ask the corporation." Then it's up to them to answer. I have taken that position many times, and I think that nothing is as important as the ethics of a situation.

P.L.: Suppose you find yourself caught between an ethical problem and a "black void". Say, for example, that you have learned that there is a very slight probability that a river has been chemically contaminated. However, to determine with certainty whether this is the case will take several days. Do

you give out the information, if the probability is so low, and risk causing a crisis as a result?

R. DILENSCHNEIDER: As long as the intent to share information is there, then you can only share it as fast as you have it and as accurately as you can. So if I did not know for sure that there was a certain kind of chemical in the river, I would not say there was. The minute I found out, I would. Until you know, you say to people, "We are studying the problem. Until it is over, do not drink the water." That is the right thing to do.

FRANÇOIS AILLERET

# An attitude of openness and responsibility

**Background**

We met with François Ailleret just after he assumed his new duties as deputy general director of EDF, France's electric utility. He was previously director of distribution for EDF-GDF (the electric and gas utilities) and has encountered various crises in recent years, ranging from grid problems, caused by wet snow, to difficulties involving PCBs. Based on his observations of the complications encountered on such occasions, he set out to introduce changes within the company. The process of change was notably visible in the Villeurbanne case, when the decision was made to dispatch a support team on-site rapidly, to work with regional officials.

P.L.: You have been developing an approach to crisis management for several years now, and your thoughts have guided various initiatives you've taken, both "under fire", as was the case at Villeurbanne, and on a regular basis by setting up new organizational structures or training programs. The first thing I'd like to ask you for are your primary ideas on handling this type of situation.

F. AILLERET: It seems to me that while the probability of a real technical crisis is very low, the probability of a media crisis based on a technical event is more significant - so you have to get ready for it. We have to realize that even though we master the technical aspects of a problem, our activity is by nature public (and this explains why our failures are sometimes blown up to be much larger than their effective impact).

Our basic attitude must be to remain open and to sense what the public expects of us. Once we've determined public expectations, we have to compare them to our analysis of the situation, to our professional ethics, and to our responsibility in managing the crisis. It seems to me that the public has at least one key demand - openness, even if the word has become a cliché. The idea is not to let tactical concerns (let alone Machiavellianism) or visions from a hidden agenda enter into the explanation of the phenomena and of our policies.

Secondly, we have to bear in mind the time dimension. There, you have to understand the different attitudes involved. On one side, the public and those whose job is to inform it - the journalists - want to have a fast and steady stream of information. On the other side, technicians largely prefer to give

orderly, comprehensive, proven, and reliable information. As a result, a gap springs open, and journalists have the impression something is being hidden from them. The answer to that is to give out frequent information, even if each contribution is limited. Take the example of problems on the electricity grid: the first announcement might be, "We know something is going on, we don't know what, but we know something is happening." Bit by bit, we fill in the picture: "We've located the problem, it's at such a point, but we still don't know exactly what it is." Then, "We now know that it affects this part of the network, and we think it will take a day or two to clear up." "This area is more seriously hit than anywhere else; here we'll need two days; but in that area, power should be back in a few hours." In other words, the idea is to build information up from a base that remains reliable and isn't contradicted by what follows. The information becomes increasingly complete, giving the justifiable impression that we are continuing to be concerned both with the technical failure itself and with informing those involved.

Naturally we can't exclude the possibility that with all good intentions, we make a mistake. In that case, we have to admit it immediately. The damage done by a mistake is infinitely more harmful when you are trying to take shortcuts, or when you don't admit you were wrong.

So that's the first point: prepare yourself by thinking ahead and by developing an open attitude, and analyze the expectations of the people affected, whom we think of as our partners. I think there is also an ethical approach to a crisis - with regard to the outside, as I've been describing, but also in-house. You have to have clear priorities. We should place the safety of our clients above everything, immediately followed by the safety of our agents, and only thereafter by equipment problems and their economic consequences. You have to remind people in-house of the ethic of openness and informativeness with regard to the outside. This way they know they mustn't withhold information, as soon as they feel there is a demand for this information. If the data isn't reliable enough, if we really have no certitudes, just assumptions, they have to be presented as such. It's better to say, "We're a little lost, things aren't clear, this is what we think it is, but it could well be something else", than to be too peremptory and say, "That's the problem", or "We have no comment." I think this is the direction you have to take, and this vision has to be shared by everyone involved, during crisis preparation drills, communications training, and of course in a real crisis.

Another point worth thinking about is what attitude to take when you notice blatant errors in the media. We're often very uneasy about that. First, we've got to tell ourselves that when we don't give information to journalists, they're going to find some other way to look for it. Consequently, if we want the press to be well informed, we have to inform them - otherwise we push the journalist toward any source available. And when there are blatant errors, in no case should we adopt a polemic style. We just have to present the facts, not request a retraction, but present the arguments showing that the

information given was false - without accusing them of premeditated misrepresentation. Above all, as soon as a crisis becomes serious, we have to stay very calm. You can't expect that everyone will behave rationally, that every word will be well-chosen, that all descriptions of events will be pertinent. But I think that's also part of this ethic: using solid, understandable arguments, you try to adjust messages that have been misunderstood or misstated.

P.L.: One fairly new difficulty derives from the proliferation of information sources. We no longer live in a segmented world, but rather in a highly competitive universe. Not that the theory of a single spokesperson is wrong, but it's no longer sufficient. What can you do about this competition, whether it's internal or especially when it's external?

F. AlLLERET: Internal competition is a matter of organization. You have to think about a problem before the crisis comes, and when it does come, you move quickly to appoint a manager, a contact person. This person won't pretend to know everything, but will be able to fall back on a network of both close co-workers and other persons sent in to provide logistical support - which is what we did at Villeurbanne. For some crises, that occupy the immediate site, the regional headquarters, and Paris all at once, you need a well-thought out organization and a disciplined approach to your work, in order to avoid the kind of discord that can really hurt. But this concern for discipline shouldn't lead to a blackout toward the people who are expecting information in Paris, in the regional headquarters, or on-site. I should specify one point about the overall organization: you have to manage the crisis and at the same time handle the company' normal activity (which goes right on, since a crisis usually isn't enough to bring the system to a halt). A single person can assume all these duties, but it would also be conceivable for a boss to say, "I'll take charge of everything that directly touches on the crisis, and so-and-so will carry on the normal everyday business. I delegate everything dealing with outside communication to so-and-so, who will act in my name and in concern with me." So there are two requirements to be met: not forgetting that life goes on, and clearly distributing roles.

As far as competition for legitimacy among outside sources is concerned, I think the only possible solution is to take the high ground yourself first, using a strategy I explained earlier: you explain things bit by bit as you verify them, maybe not 100%, but with a high degree of reliability, and you don't hesitate to go back on a statement if it proves to have been badly positioned or poorly expressed. If we say what we know while respecting an ethic of both openness and what I call total good faith, it seems to me that we can earn full legitimacy for our explanations. If the people who know aren't talking, their attitude immediately lends legitimacy to other sources, with all the risk for error we've already seen.

Of course, some situations are extraordinarily tough. It's the responsibility of those directly in charge of the matter to keep an eye on their guidelines, but also to have a sense of the situation - and this may lead them to speak up

earlier, thereby taking a risk, or to wait, thereby ensuring greater reliability. Or to let some other source speak out, provided they don't think it will contradict their strategy of openness. Or on the contrary, they may choose to take the high ground right away, and even be firm and direct about it, if they think there is undue risk in letting non-legitimate sources be heard. My experience is limited, but every time bad information has gotten out, it was because we waited too long to say what we could have said early on.

I think too that when a crisis lasts some time, if you show how you work, by saying, "Next news briefing, next press conference in two hours, or tonight at midnight, or tomorrow morning at seven", then you make your presence felt. You can't stay legitimate if you aren't willing to speak out.

That much said, you sometimes run into subjects that are generally mingled in the public mind. I've seen serious confusion over several cases involving PCBs and askarel: hot incidents vs. cold incidents, pollution of water tables, dioxin identified in Seveso. The people who are going to make pronouncements have to know their facts and be able to head off misinterpretations that could be made. When askarel and PCBs are involved, I think the first statement should always be somewhat educational, along the lines of "there are two types of incidents: cold incidents, that happen under such-and-such circumstances and can have the following consequences, and hot incidents, that occur under such-and-such circumstances and may have these consequences; the present situation involves ..." and you explain the situation. Otherwise, the first link in the chain is missing, and the people who have to report the information may go to their archives and refer to a matter of a different type, thereby creating great confusion.

P.L.: Another problem we've seen is the company caught in an awkward situation because of its outside partners, namely political leaders, who make up a weak link in the crisis management process. What do you do then? Don't you find yourself having to play new roles that you aren't qualified, on paper at least, to fulfill?

F. AlLLERET: That's for sure. I think there is important work to be done in clarifying things among those in charge. You have to make certain that the system of decision-making powers is even better defined in a crisis situation than in normal times. In a calm situation, you always have a little margin if you realize you've made a mistake. There may be economic or financial consequences, but they generally have no immediate impact on human safety, or any repercussions in the media. In a crisis, powers have to be very clearly defined, even if the person holding the power clearly states that in a given area, power has been delegated to somebody else.

Now of course everyone thinks about the media crises involving nuclear energy, a field in which many different parties feel implicated. Seen from the outside, it may seem hard to get a handle on such a burgeoning number of contacts. Who is qualified to speak about what? Here again, maybe when officials from a given sector speak out, their initial message should be

educational, to specify the roles: "In a crisis situation, EDF is responsible for everything happening inside the reactor; another organization takes charge of what happens outside." So everyone would begin by, "I'm speaking as a representative of this group."

P.L.: But the risk remains of a gap in background between various groups, and this can entail different information options. You can go in flags flying - which may very well deepen the crisis - or with resigned acceptance, which can be deadening for everyone, including your own organization.

F. AlLLERET: Here again, I think you can prepare with the other parties involved - for a start, get to know them. When a partner seems distant, but turns out to be another key actor, it's better not to make that discovery the day of the crisis. It's better to see that beforehand, when there's no excitement, no power play, and to talk out the way you all see your respective responsibilities. It's much easier to make a second contact during the crisis.

Then, if it comes down to a very confused and tough situation, I'd say everyone has to examine his own conscience and evaluate his responsibilities - and not with an eye toward seizing power ("So-and-so is in trouble, now's my chance to speak in his or her name and get the credit myself'), but simply with an attitude of openness toward the expectations of others, especially the public. No one should forget, either, that public opinion is absolutely not interested in a technical crisis by the various powers held by one person or another. What it expects is information on the situation and the steps to be taken. If you stay with this perspective, you can probably avoid treading on toes to some extent.

P.L.: What about problems caused by the duration of a crisis? We often see difficulties in this area.

F. AlLLERET: I think we tend to dismantle the crisis units and the specific procedures for exceptional situations too early. The people in charge tend to check out when a problem is 95% solved. The reaction is, "OK, tomorrow it will be 100% solved." This leads to a brutal letdown after the tension of the previous phase. And the people busy with the remaining 5% are forgotten. For them, the problem hasn't been solved: they need a contact person. Especially in the area of communication.

I've seen this clearly during power failures, for instance in January 1987 after the electricity strikes. We set up a crisis unit. When the strike was over and the network could be managed normally - on Monday morning - we disbanded the crisis unit (besides, we were getting almost no more telephone calls). But we realized, looking back, that the measure had been lifted too soon. A number of r regional managers still had local problems to handle, often of a different type, and they were hindered by the disappearance of the crisis unit. We should have checked with them whether we could close the unit. When you've had a widespread incident on the network and 95% of the customers have electricity again, the remaining 5% feel even more handicapped. If at the very moment when the demands of those people become justifiably more pressing, you also take away their contacts, then you

can only aggravate the situation pointlessly. The crisis unit should never be dissolved until the people it deals with, and who are its main reason for existing, feel it has nothing more to offer them.

P.L.: Another frequently encountered problem takes the form of heavy pressure to shut down a system as soon as there is an apparently inexplicable failure.

F. AILLERET: I think the decision to stop a whole series of machines because one of them has failed seriously is an extraordinarily weighty decision. But I don't think our only choice is between this radical solution and its opposite, which consists of saying, "One installation has problems, we'll take care of it and let the others run as if nothing had happened." There is an intermediate posture, that consists of saying, "The installation in trouble will of course be stopped for as long as necessary, and the other units will be placed under reinforced surveillance." That is to say, whereas under normal circumstances, you would accept a given situation because the probability of a hazard is extraordinarily low, you move your precautions up one notch. I think this is the wisest attitude, because when you've had one failure, no one will accept any errors anywhere else. So you have to be even more vigilant, though without reducing the risk to zero by shutting down all the installations. That conveys both common sense and responsibility, and it goes over pretty well: "We have problems with this reactor or that transformer. Stopping all the reactors or transformers would have extremely severe consequences, and objectively, nothing justified such a move. But we're reinforcing our controls, with a more stringent level of precaution than usual, and we'll stop any other units if that proves necessary." You have to avoid over-simplifying, in either direction. And be fully aware that if a second accident occurred for the same reasons as the first, that would spell trouble. (It's obvious that with 10,000 PCB transformers in operation, there is a real danger of repeated accidents, which drives us to take costly and draconian preventive measures.)

The underlying attitude must be one of humility and responsibility. You have to study all the intermediate situations possible, knowing that it's always easy to decide to stop the system, but it's infinitely more delicate to start it up again. On what grounds do you make the decision? What kind of image do you give by making apparently unfounded gesticulations? It's very grave to give the false impression that major flaws escaped the attention of the system. It's equally damaging to offer the spectacle of bureaucrats in ivory towers wrestling with decisions.

P.L.: Clearly much remains to be done in developing these new organization approaches. How do you conceive the learning process to be created?

F. AILLERET: I think there are different strata. On the deepest level, and especially for questions dealing with public communication, there are problems bound up in habits and in company culture (even if that phrase is

something of a cliché). That should push us to think about crises that hit others and to ask ourselves with humility what we would have done. We need to reach a better understanding of how our society and the expectations of our fellow citizens are evolving, not only in crisis situations but in everyday life as well. That's a long-term problem, since evolution is by definition something gradual.

But at the other end of the scale, I'm convinced that there are problems involving know-how and operations that probably aren't very hard to solve, with ideas like creating a crisis unit, distributing roles, coordinating, and so on. These are all technical aspects, and we can move fast there. We can develop training and emphasize the importance of these pre-occupations whenever someone new comes on board ("You're responsible for this and that, so think about how you're organized for a crisis"). We can also use the track of doing a post mortem on a crisis, even a small-scale crisis: even a summary evaluation can bring to light various problems with logistics, personnel, or making ourselves understood, as well as other factors that are easy to improve.

And then there are somewhat intermediate questions: in-depth organization, controlling the time dimension, dealing with confusion between different authorities. Here again, we can probably make the most progress by thinking about it, trying to set guidelines, and doing drills now and then.

So there are several avenues of approach. But as you know, overall changes come slowly. In all likelihood, if a really deep, harsh crisis hit tomorrow, it probably wouldn't be treated much differently from five years ago.

P.L.: Things are moving, but there are areas of reticence -

F. AlLLERET: - that are probably due to an insufficient awareness of public expectations. If you respect the public, of course it can always accuse you of not doing your best, but there won't be a boomerang effect. When you leave expectations totally unsatisfied, you open the door to voices that have absolutely no legitimacy but that acquire legitimacy because they fill the gap left by the people who should have had a presence.

It' one thing if we appear to have made technical mistakes, but to have taken full responsibility in trying to limit their consequences. It's something else to say "hush-hush" and to avoid issues - that gives rise to a public sentiment that not only mistakes were made, but they may not even have been identified (since nobody will talk about them). We emerge looking empty-handed and out of control (since we don't seem to be fulfilling our role). You have to realize that in a crisis, public opinion will give no quarter. Nobody has anything to gain by being disdainful or simply absent. It's better to admit to the errors made, recognize your weaknesses, and try to explain the situation clearly and without complacency, and to face up to the harshest critics. Otherwise the risk is, the public may rapidly arrive at the conclusion that your representatives have no sense of responsibility. In my opinion, that's the worst thing that can happen.

HAROUN TAZIEFF

# Who will have the courage to prevent catastrophes?

Background

Haroun Tazieff - former French Secretary of State in charge of Major Risks Prevention, is a well-known volcanologist and a figure of international repute in the field of major hazards.

P.L.: For many long years you have made your presence felt in the field of major hazards. I would like to go back over your experiences with you, over your view of the difficult questions that contemporary societies are having to face with regard to the challenge of major risks and of managing crises.

H.TAZIEFF: For me, everything began on May 20, 1960 in Chile, where I discovered just what a high-intensity earthquake was: some 100,000 dead and, as always, many, many times more wounded, with enormous problems for the survivors, the entire economic and civilian infrastructure laid to waste, and colossal difficulties for the government. The first question that came to mind was, how should the emergency aid be organized in a large-scale catastrophe?

Things got started in the Goûter refuge on Mont Blanc, where I was with Gaston Rébuffat, when we heard on the radio that an earthquake in Chile had triggered a volcanic eruption. I jumped up: "Gaston, I've got to go there." Actually, whether eruptions can be triggered by tremors was a subject of hot scientific debate: could a seism set off an eruption, or not? So I left Gaston to continue his crossing of Mont Blanc as part of the filming of his beautiful movie *Entre Terre et Ciel* and at the crack of dawn, I scooted down the Goûter peak, jumped on the train, caught my plane, and arrived in Chile.

There I discovered the effects of the strongest tremor ever recorded, and those effects were frightening. I first "investigated" about what had motivated my trip (in fact, the volcano was ripe to erupt and the earthquake had simply hurried things along), and that led me to find out what a colossal-scale catastrophe was. During my wanderings - including cavalcades of several days in the southern winter, airplane and helicopter flights over the area, and

and to witness the high price of badly-organized emergency measures, the absence of any prevention, and the tendency for governments to play with the statistics (e.g. some 50,000 deaths officially announced, which was half the real figure, and which was divided again by ten the following year). I was scandalized by the lack of preparedness, by the corruption, by the misinformation, by the displays of selfishness.

All this led me to wonder about the measures that have been taken to deal with large-scale catastrophes in our own countries. History has shown that we are not out of harm's reach. There were colossal earthquakes in France at the end of the Middle Ages and during the Renaissance. For a long time, it was totally impossible to *forecast* tremors, until 1980, when three Greek specialists succeeded in developing a remarkably efficient method - which I had officially adopted in France by then-Prime Minister Laurent Fabius on February 2, 1986.

What remained was *prevention* (e.g. constructing buildings that won't collapse) and organizing *efficient* emergency action (in order to save as many survivors as possible).

When I was asked by President François Mitterrand to take charge of the matter at a government level, I realized that the existing emergency plan was totally incapable of handling a large-scale disaster. We could handle serious accidents, and even do a very good job, but not the big catastrophe. On that point, France is no different from other countries. The error is to believe that by simply adding together available resources, we could deal with the change of scale in this area while maintaining the same structure that is used for medium-sized incidents. But lining up so many excellent fire and rescue brigades in no way constitutes a group that can be effective when faced with a disaster.

In this area, a structure that can function within existing hierarchies is a *sine qua non* condition for effective response.

This poses serious technical problems. Take radio transmissions for example: the firemen aren't on the same wavelength as the paramedics, or the police force, or City Hall. One day I was in a helicopter and found that it was impossible to talk to the prefect, who was in another helicopter not far away, in the fog. We had to land in order to talk - and also to avoid running into each other in flight.

The key thing in this area is to have a solid framework in place, with a clear hierarchy, on which you can hang all the elements for emergency action. In France, only the Army can furnish such a hierarchical pyramid structure. That is why I've stood up, not for the Army in general (since turning to the military can create very serious problems, as we have seen only too often, in too many countries), but for the *specialized* units that it can put together. That is why I urged the development of civil defense intervention units, units specially trained to act in a catastrophe, which would be placed at the disposition of the Ministry of the Interior. This is also why I proposed that we use our military defense zoning as the basic geographical division for which emergency aid and command structures would be

organized - so everything wouldn't be centralized in Paris, and so we wouldn't be hemmed in by district or county boundaries, which are much too narrow. These efforts paid off, because that guideline has been incorporated into a new law on civil defense.

I called - in vain - for a drill to be organized in 1988 in the Isère region of France, near Grenoble and the French Alps, to test these improvements. We also wanted to see if the lessons drawn from previous failures, both in other countries during real catastrophes and in France during earlier drills, had been well learned.

P.L.: Suppose you are consulted to act as an expert advisor during a crisis. What do you have in mind when you arrive on the scene? Of course you've probably already been in this situation.

H. TAZIEFF: Yes, that has happened to me some twenty times.

Each occasion was a rich learning opportunity for me, to learn about very diverse things. For instance, in 1963, the President of the Republic of Costa Rica invited me to come and give an opinion on the eruption of Irazu, which was causing grave social and economic problems. Furthermore, he wanted to know whether this slow eruption could culminate in a catastrophic paroxysm. I told the ambassador who had been sent to me that in this case, no one could predict anything, and there was no point in my coming. The next year, however, the eruption was still going on, and Costa Rica reiterated its request, so finally I went, accompanied by a good team of seismologists from Ecole Nationale Supérieure [France's leading research university]. As I had suspected, it was impossible to tell whether there would be a paroxysm. But what I saw very quickly was that the quantity of ash accumulated since the beginning of the dry season was so great that when the rainy season came, it would unleash devastating torrents of mud. I explained this to the President: "The city of Cartago is right on the axis of these imminent 'lahars'(mud slides). You have to protect the population - by training people and telling them how to behave when the alarm comes, and by organizing a good, effective surveillance as soon as the rains return. Once alerted, these people will have at least half an hour to reach shelter." The response I received was polite, as it always is at that level. But nothing was done. So I had to use threats: "If you don't act on what I've suggested, there is no reason for me to stay here. I'll go back to Paris and hold a press conference." That's how I managed to get our recommendations enacted, and as a result, when the rains came, a few weeks later, the surveillance, the training, and the watchfulness imposed on the population, as well as some infrastructure work done in the meantime, meant that there was not a single victim - instead of hundreds, or even thousands - and the cost was nominal.

Compare that result to the catastrophe of Nevado El Ruiz in Colombia in 1985. My colleague Franco Barberi, a professor at the University of Pisa, had written an excellent report on the very same risks posed by the ice cap on the volcano, which was then undergoing eruption. He had delivered it personally to the governor of the province in question. He emphasized the need for surveillance, for setting up a few observers around the edge of the

ice cap with radio equipment to sound the alarm and, as in Costa Rica, for training the population. His efforts were in vain.

The death toll was 25,000. I was called in immediately by the Colombian president. Once there, all I could do was repeat and emphasize the necessity for surveying the volcano, because the same phenomenon could very well recur. To my knowledge, however, nothing has been done to date.

With all these problems, you have to deal with incompetence, vanity, greed, social climbing, and rackets of all sorts. The examples are legion - in this country just like everywhere else.

P.L.: One of the most heavily-debated questions in recent years has been how to handle information. You have always made a case for total openness.

H.TAZIEFF: Information and training are fundamental. Above all else, you have to understand the dangers as well as possible. This is why I proposed a serious study of both natural and industrial hazards threatening the Isère region. We found 350 volunteers, ready to provide the best possible cross-section of all the local actors, of the whole political spectrum, of all the skills and resources available. We divided them into twelve working groups according to the type of hazard to be studied. They all agreed to provide clear, limpid information, without any newspeak. For example, we informed the population about the potential hazards from a major chemical plant in Pont-de-Claix; we told them how to behave (e.g. if there has been a toxic gas leak, close the windows and wait for the cloud to disperse; in case of a mud slide, go to high ground and take blankets with you, and so on). These tricks are simple, low-cost, and effective.

P.L.: Many would object that this is a good way to stir up hard-bitten resistance, that there are cases in which it is not so easy to protect the population, and that, in the meantime, it is better not to ask too many questions -

H.TAZIEFF: - and they are fundamentally wrong. In any case, I would base myself on the courageous ideas of leaders like Churchill, or Gorbachev today: tell the truth, however unpleasant it may be, and appeal to people's intelligence, intellectual courage, and solidarity. I would also reply that we live in an increasingly industrialized society that offers a multitude of ways to improve our lives. When someone of my generation looks back on his or her own youth, it is stupefying to see all the means we now have available that were once unimaginable. There are risks: we have to minimize their impact. Certainly we are menaced by catastrophe, but we mustn't attack the wrong enemy. Why not start by doing what would be easy - if we had the courage to act (a courage that no administration has yet had)? Begin by drastically reducing the massacre on our highways for one thing, and by fighting pollution, for another.

We also need to institute more rigorous and efficient controls of industrial activity. I called on the Council of Ministers to double the personnel assigned to regional offices in charge of industrial safety, which are incredibly understaffed. No one moved, and the situation has gotten worse. Sooner or later, something will be done, but probably too late - the day after a major

catastrophe. In the meantime, the biggest monster of them all, pollution, continues to gnaw away at the atmosphere, the water, and the land.

I would also make an appeal to bring in outside experts. This was supposed to be part of the safety studies to be done on highly dangerous sites. There are expert organizations with the means to handle what has become a vital task - but does anyone really want to develop this practice, however vital it may be?

I would also appeal for an efficient emergency action organization. Catastrophes like those at Bhopal and Mexico City pose a continuous and *increasing* threat to our society, France included. Prevention is the best medicine. It protects so much more, and it costs so much less.

LAURENT FABIUS

# Our societies: ill-prepared to face complexity and the future

Background

Among the technological accidents that took place while Laurent Fabius was Prime Minister of France, the sinking of the Mont Louis and its containers of uranium hexafluoride (on August 25, 1985) undoubtedly attracted the greatest attention. During the interview presented below, the Prime Minister offers us his thoughts on the difficulties encountered by contemporary societies, France among them, in facing up to the challenge of preventing and controlling crisis situations.

P.L.: In late August 1985, the Mont Louis matter aroused public opinion. The danger was felt to be great, there was some hedging over which technical specialists were to take charge of the case, and the press was explosive, as befitted the reticence it encountered in trying to receive information. The first question that comes to mind is: how, as Prime Minister, did you analyze these events, and in a more general manner, the dynamics of other technological crises you have encountered?

L. FABIUS: I'll give you an answer on the Mont Louis in a moment. First, I'd like to begin with another example. When Chernobyl happened, a newspaper drew up a chronology of incidents that had taken place in France in recent years. I looked at that list, and suddenly one of the dates surprised me: I had been Minister of Industry at the time, and I had never heard a word about that business. Thinking my memory might have failed me, I called one of my former associates - he had never heard of the incident either. The case had been considered a serious one, but no one in the cabinet or the ministry had ever gotten wind of it.

This is one of the problems we face - maybe not for a major crisis, in which case I would necessarily have heard about it, but for something that could become a crisis. How does information make its way to the top? People only turn to the political powers in really serious crises, very late in the game. This is why it's difficult for these powers to target preventative measures the way they ought to. That has been my experience, and I imagine the same is true for other political leaders.

More generally speaking, the basic question is, how does government work? There are two overlapping remarks here. The first is that government - and is this only true in France? - spends a great deal of time preparing for a decision, a certain amount of time making a decision, and almost no time on following up the decision and its consequences. I think that's a shame. I could cite numerous examples - this is a general characteristic. It is highly revealing about how our planning procedure works: a highly-developed collective preparation, a certain impact on the decision itself, but little or no retrospective examination of how effective public policy has been.

My second remark is, France is a society which needs to develop checks and balances. One conclusion I drew from the Chernobyl catastrophe was that a body independent from the French atomic energy commission and the electric utility should be created, that would practice true openness and would be responsible in matters of information and for launching civil nuclear power plants. Ideally, the same procedure should exist for Europe, but we should already begin in France. Otherwise I don't see how we can efficiently manage to prevent a whole series of difficulties in the nuclear sector. Could this procedure be applied to other areas? Why not? Government has a role to play. But we should set up specialized, independent organizations - without creating a log-jam - organizations that can debate, and sometimes even make decisions, independently of the oversight of existing powers.

More generally, our democracy is built on an outline in which the fundamental powers are military, economic, and political. Now, new powers are appearing: administrative power, science and technology, audio-visual power. Those powers really don't fit into the present-day structure in which French democracy operates and has found its balance. If we don't find a way to integrate them, we will continue to have problems preventing and mastering crises.

P.L.: As a matter of fact, as soon as there is a crisis or even the beginning of a slip-up, we often see systems spin their wheels and become unable to anticipate or find solid footing.

L. FABIUS: Only too rarely do we think a crisis is possible. As far as anticipation and preparing for decision making are concerned, of course there are bureaucrats who examine the various possible solutions. But they often realize they don't have the means, that there are roadblocks, or that they don't have the necessary powers to undertake action. This explains their reticence about organizing even simple simulation drills. There are departments and groups working on the question - but here again, their projects tend to fall by the wayside. It soon becomes apparent that if a real crisis took place, things would change scale radically: "This is getting too big for us, so we're dropping it." We don't really take such situations seriously, which is really too bad, and that should provoke a reaction.

As far as the actual reality of a crisis is concerned, let's go back to the case of the Mont Louis. It is not my memory at all that there was any official effort to dissimulate anything. Above all, I recall endless discussions on the responsibilities (between organizations and between governments) and on the

technical difficulties we were encountering. If the containers had leaked, one thing is for sure: we would have been too late. If I can make one general remark on the information aspect, the public imagines that there exists a place where we know everything and can do anything. It has the idea that there is a sort of all-knowing central office. This explains the frequent suspicion that secrets are being kept. In the reports I received, I don't ever remember reading anything that didn't reach the press, and my motto was always "Openness".

P.L.: Now more specifically, how were you, as Prime Minister, plunged into this matter on Saturday, August 25, 1985?

L. FABIUS: First I was informed: "There are sunken containers, we don't know exactly where." I asked, "Is it serious or not? How might the problem evolve?" Answer: "It's not really serious, but..." I asked, "What can we do?" Answer: "Not much, and besides, because of where the ship went down, it's within another country's competence." I then gave the order to the ministers involved to follow the matter with extreme attention and to report back to me. The rest is history.

It's important to emphasize that in certain areas (airline hijacking, for example), more of the kinks have been worked out of crisis management. As soon as a problem arises, specific procedures are brought into play. These have developed bit by bit, from one trying experience to another. We know the role of each minister involved, the messages that have to be sent, the specific actions to be taken - beginning negotiations, finding a spokesman, and so on. In technological crisis situations, there is not only a procedural problem, but a technical one as well - and that's where the actors are often at a loss. This is why I think that longer term efforts, like those made by Haroun Tazieff (on the issue of earthquakes in the Mediterranean basin, in particular, or on river flooding) offer an excellent approach. You need to have a view of the long run.

Our administrations already have enough trouble trying to deal with what can be foreseen (look at the problems we run into in fighting forest fires, even though they happen every year). They are often helpless when faced with unforeseen difficulties.

P.L.: And why, in your opinion, is there an almost cultural resistance to thinking about things that aren't immediate emergencies?

L. FABIUS: Is it part of human nature, or is it a specific characteristic of French government? I note in any case - and I regret - that we tend to believe that what has been prefigures exactly what will be, and what is urgent comes before what is important. These are grave errors.

P.L.: But we are going to have to manage increasingly complex systems, which are going to continue to generate unforeseen events. Don't we run the risk, in your opinion, of encountering more and more pitfalls?

L. FABIUS: That's the risk. And I suppose you are dealing with the following question in your own work: what kind of governmental, administrative, or social organization is best equipped to prepare for and respond to a crisis? For me, the most advanced societies are those that have

the strongest preference for the future. French society has a very weak preference for long-term considerations - investment, tax issues, training, forecasting, or others. We need to re-focus public policy very sharply.

P.L.: What do you think of the incredulity, of the lack of confidence shown by both public opinion and informed observers toward the authorities as soon as there is a hint of a crisis - what would happen if there were a really big problem?

L. FABIUS: I read an expression in an article from the daily Le Monde that seems to hit the nail on the head: "The fear of communicating ends up communicating fear." That's right on. It would be more to our advantage to put all our cards on the table.

It would be impossible to improvise a response to a major crisis in a few minutes. So the question is how a society, a government, an administration, and an economy should be organized to prepare for crises and to try to prevent them. Let's take the example of civil defense. France has excessively limited means in this area, for two main reasons: one, there is a notion - which I think is ridiculous - that if we develop civil defense, we would actually undermine our nuclear deterrent, because by reducing the dangers for the civil population, we would also remove the certainty that France would launch a massive retaliatory strike if she were attacked. Second, there is financial resistance, often unjustified if you take a broad enough view of things. On top of these two factors, there is a sort of Pontius Pilate attitude with regard to certain scourges of our society (look at the case of alcoholism or cigarette smoking). Among the procedures to be established, a distinction would have to be made between the people who decide whether to examine the possibilities of a crisis occurring and those who will be responsible for managing it. We should also make an overall audit of zones of weakness.

P.L.: But you would have to deal with a lot of reticence.

L. FABIUS: Of course. In fact, I would note that when I wanted to make major changes, I often had to work outside of conventional procedures. This was the case with economic restructuring in the Lorraine region during the mining crisis: very quickly it became clear to me that I couldn't simply operate within conventional channels, and to handle the crisis, I named a specific manager, Jacques Chérèque, who did remarkable work. When I wanted to bring computers into all the nation's classrooms in six months - because France was behind the times -1 named Gilbert Trigano[1] according to an *ad hoc* procedure. When we created special Mediterranean support programs to accompany the entry of Spain and Portugal into the Common Market, the procedure we chose was specific. And again, when the independence issue exploded in New Caledonia, we chose Edgar Pisani as our special envoy, for an appropriate type of intervention. Or again, when we give Bertrand Schwartz a mission on youth employment. You put someone in charge, you set a deadline, you define a specific mission - people know they will have to give an accounting.

1. Founder of "Club Med".

Beyond the crisis problem alone, you have to take two key notions into account: the preference for the future - which I already mentioned - and complexity, which means uncertainty. These are the two predominant notions which should be engrained in the very way we train people, because what we have to alter are attitudes.

P.L.: But the fact is, there is no place, in France or elsewhere, where we can study these problems.

L. FABIUS: That's right. Too many people have yet to understand that today's politician, in the broadest sense of the term, should be someone who sets challenges. We need places to determine exactly what those challenges are.

GUSTAVO ESTEVA

# Victims can organize themselves

## Background

Gustavo Esteva, a Mexican critical intellectual and a spiritual heir of Ivan Illich, has followed an unusual career path. He was a high-ranking civil servant (deputy director of the budget, president of the Mexican planning agency) and a top executive in multinational firms such as IBM and Proctor & Gamble before becoming a university professor and author of several works on rural development. Since 1975, he has been involved in developing networks of peasants and underprivileged urban groups. He believes it is essential to build effective alternative forms of development - imitating rich countries leads, for him, to a sure dead-end that can only increase crisis potential. The very tangible action undertaken by these networks is focused on both lifestyle choices and technological choices. It aims to show people that they can take charge, without always passively expecting everything from the models imposed on them. His network, the intercultural network for autonomous action, has woven links among hundreds of groups both in Mexico and abroad.

The following interview offers some insight into the backdrop to a disaster as seen by this type of organization. The starting point is the September 19, 1985 earthquake in Mexico City that caused between 10,000 and 20,000 deaths and left 50,000 wounded and between 150,000 and 200,000 homeless families, or about one million persons. Gustavo Esteva emphasizes that this experience is simply a larger-scale replay of what happened less than a year earlier, on November 19, 1984 in the catastrophe at San Juan Ixhuatepec (in the San Juanico neighborhood).

Esteva's essential message: People have to learn to organize themselves at the grassroots. Of course he emphasizes that natural catastrophes cannot be compared to technological ones. But the lines between the two cannot be too sharply drawn. The reconstruction technology selected after the quake was in itself a social catastrophe caused by technology, grafted onto a natural disaster - the building style forced on the neighborhoods destroyed any possibility of social life, since the rabbit-hutch model was imposed in the stead of patios which had been the focal point of community life, something essential to tolerating poverty. A door had been opened to social disintegration, violence, and decline. Esteva's ideas are wider-ranging - he is concerned less with handling crisis situations, a subject he finds downright dangerous, than with communicating the understanding that a style of development can in and of itself be prone to crises that become increasingly unmanageable. This is the background. Given the orientation of this book, however, the interview itself stays close to the immediate experience of these organized networks in the period surrounding the disaster.

This interview was conducted by Cesar Cordova and Maribel Vargas in Mexico City and reviewed with Gustavo Esteva during one of his visits to Paris.

G. ESTEVA: The earthquake hit on September 19 at 7:20 am. Immediately, lots of people rushed outside to see how they could help. Members of our group did as much - without stopping by the office, without consulting each other beforehand, they took their picks and shovels and went to the scene of the disaster.

That afternoon we had our first group meeting. The goal was to see what we could contribute. In the short term, we could simply do what millions of people were busy doing: take part in the rescue effort. What impressed us most at the time was not so much the heroics or the solidarity, but rather the extraordinary demonstration of how these people were capable of organizing themselves. It wasn't a horde or a panicking crowd, it was an organized society. That doesn't mean people arrived in pre-arranged battalions. But on-site, they were able to structure their actions within a few minutes, without arguing endlessly over who would do what.

You have to realize that we were faced with an unprecedented disaster. Never before had a catastrophe on that scale hit such a large city. So there were millions of people participating in the actions we're talking about. In any disaster, people work and stick together, but here there was a significant quantum leap.

Another element for thought: people tend to think, and this had been our feeling too, that in a city of that size and with its particular characteristics, people have become totally dependent on institutions. There's a problem? Just wait for the institutions to deal with it - you wait, passive as can be, for the firemen or the Red Cross. The earthquake proved that this wasn't true, that in this city a capacity still existed for conviviality, solidarity, and amazingly lively self-organization.

As for me, I was surprised and enthusiastic to see this organized society. Of course the situation was painful. Several of my friends died in the quake. A very close friend of mine lay for twenty-one hours under the wreckage of the Nuevo Leon building in Tlatelolco (and in fact she was saved by an unemployed fireman and a Red Cross volunteer, not by the institutional apparatus). But above the pain and grief caused by these deaths, I felt a sensation of inner lightness as I watched this impressive display of solidarity.

At the start, we felt hopeless when we saw how limited we were. But very quickly, we found other ways to be useful, by organizing the damnificados, the victims (for problems of constructing shelters, getting food, and so on). By the fourth day, some of us had began to share information about groups that had already worked with peasants or social dropouts and who were now trying to work in an organized way with the quake victims. That was when the idea emerged of setting up what we called a coordination. On September 24, each of us went and talked with friends and people we knew and invited them to an informal meeting to be held the next day.

*On September 25, we already had drafted a little document that served as the written basis for constituting a network with the one hundred-odd organizations that answered our call. This is how we set up the Red

Intercultural de Accion Autonoma, the intercultural network for autonomous action. That same night it was decided explicitly that the network would have no constitution, be it legal, formal, or institutional. It would not become an apparatus charged with receiving and distributing aid, it would be exclusively a mechanism for coordination among the victims and the groups that wanted to help them.

The network began to operate that very night, with an informal secretariat and volunteers who took turns manning the phone. Actually, the network was nothing but a telephone (used by people who took turns spelling each other) and working committees that got organized at the same time and set about coordinating various actions.

There was frenetic activity. We got calls like this: "I have no resources, no money, and no technical knowledge, but I'm free all day - how can I be useful?" One of the committees took care of coordinating these offers and directed them towards the hospitals and first aid centers. These people could be useful to the injured, to those who were starting to regain consciousness. Sometimes, they couldn't even remember their names, they didn't know where their families were or what had happened to them. The doctors and nurses obviously didn't have time to help them with these problems. The first support we could offer them was to act as messengers - to find the family and have them come, to inform the victims about their loved ones and their homes. Somebody also had to stay with the victims until a member of the family arrived. This committee then focused its work on physical, psychological, and economic assistance for the wounded.

Two critical decisions were made in the first days. The first was immediate: to act as a network rather than for everyone to join one of the pre-existing groups. The second came a little later, as soon as we were no longer faced with the sole problem of digging people out of the rubble: it was to help the victims who were out on the street. We also had to take a position with regard to the authorities. Often, we felt that their interventions on the disaster sites were not the wisest. They didn't tackle the most necessary issues, and sometimes they hindered or bothered other more useful actions. What we were most afraid of was that things would degenerate into violence, as we had begun to see with our own eyes: citizens exasperated by a policeman or a bureaucrat were coming to blows. That could slip into a terribly dangerous situation. One of the roles we gave ourselves was to try to maintain working relationships, develop concerted efforts, and not leave the door open to confrontation.

M.V.: Mexico had just been through the disaster of gas explosions at San Juan Ixhuatepec, on November 19, 1984. Did that serve as a prior learning experience? Was there any connection between the two events?

G. ESTEVA: I don't think there was any formal learning. But there was a collective memory suggesting the attitude to adopt. The San Juanico experience had demonstrated one fact: by the time the authorities arrived, the

people had already done most of what was urgent, like helping the injured. That experience had at least demonstrated that there was no point in waiting for someone from the outside to come take charge of the problems. This realization was certainly engraved in collective memory, and the earthquake served to awaken this memory. Yes, the population was capable of doing something - contrary to what it had been indoctrinated with for decades, i.e. that the people are fundamentally incapable of doing anything under such circumstances.

The creation of the main modern public institutions is founded on this premise. San Juanico revealed how false that reasoning was. In a catastrophe of this type, the institutions inevitably arrive too late, and they can also act in ways that are regrettable.

Of course there are things people don't know how to do, and there, institutions can take charge with their teams and their technical resources. But the most urgent and most important things in these cases are better handled by the population than by the authorities, institutions, or professionals. Organized bodies are hampered by problems of professional rivalry or prestige - and this came forth during the earthquake, as was reported and published by one of the interpreters placed at the disposal of the foreign teams. Unorganized people saved a lot more lives than the experts who came from fifteen foreign countries.

M.V.: How did you perceive the role of the media?

G. ESTEVA: It's somewhat ambivalent. During about a week, the media played a highly valuable role by bringing up-to-date information. There were no more telephones, there was no way to have reliable information, and the media acted with extraordinary efficiency as information transmitters. In a way, people appropriated the means of communication and used them to meet their own needs. But the media also caused grave problems. The first came from their pretension to coordinate. Nobody had enough information to coordinate the work going on in the city. It was simply irresponsible for a group of journalists - even with the best intentions in the world - to try to coordinate activities, saying, "Go here, don't go there." They sent people where they weren't needed, and vice versa. By the same token, passing along false information can also have harmful effects - it leads thousands of people into error. You can't simply declare yourself a coordinator and improvise the job.

The most harmful effect was the campaign organized by the first day to encourage people to stay at home. Systematically, the media said, "Don't panic, stay at home, it's better not to do anything, the authorities will take care of it." Just at the moment when a prodigious movement of millions of people intent on doing something was building before our very eyes. Actually, a lot of people couldn't stand to stay at home, inactive.

M.V.: What were the most critical moments and the major problems your informal organization encountered?

G. ESTEVA: Although this may sound like a paradox, the most critical period was not the first week, even though there were tremendous rescue problems. The most critical point for us came during the first half of October. Most of the victims had been tenants whose rents were frozen by a 1942 decree. They paid only a nominal rent for their very modest apartments. But this definitive right no longer applied to a pile of rubble. The landowners and the authorities, who had already tried thousands of ways in the past to evict people in order to renovate the center of Mexico City, saw an opportunity there to achieve their ends. The door to real estate speculation was wide open. The landowners had the law on their side - tenants had rights to a dwelling, but not to a lot covered with a pile of rubble. The inhabitants of these neighborhoods sensed the manoeuvre. Attached as they were to their environment, they took steps to avoid being thrown out of their neighborhoods. They stayed on the sidewalk, in the street, in the courtyard, to hold on to their places. Many of them were actually risking their lives, because there was a danger of buildings collapsing. But they didn't want to run another risk, that of losing their homes. The landowners and the authorities tried to do just the opposite, to make them leave by offering them housing elsewhere.

The conflict was really very harsh, and there was no clear solution. Property owners and the authorities had the law for them; the victims had historical and cultural logic. The problem wasn't a simple one for the authorities. To kick out the victims, they would have to use the army - which was unthinkable, because national and international attention was focused on them. So the government went against its own ideological orientation toward denationalization and decided to expropriate the lots. That was both a solution and a problem for the tenants. They hadn't been kicked out, but now they were faced with a single landowner who was taking charge of the rebuilding process.

Shortly after that episode, there was a second very difficult moment, when the question of foreign aid, both governmental and non-governmental, was raised. The fact was that during October, and for various reasons, two initiatives - ours and that of the government - coincided to stop this flow of aid. We wanted to stop the aid because it was actually harming the victims. We've often cited the following example to illustrate the situation: Mexico's FAO representative received an order from his boss in Rome the day after the quake to give $750,000 to the Mexican victims. The representative immediately set up a committee, which dug out an old project for creating soup kitchens in Tepito (one of the areas hit). The operation had two goals: to meet nutritional needs until the victims could return to their normal way of life, and to provide nutritional education. The people in Tepito reacted violently to this proposal, with two arguments:

- "For twenty-five years, we in Tepito have been eating escamoche [their word for restaurant leftovers, which they prepare right in the street]; and for

twenty-five years, we've been very happy with this diet; we don't want industrial escamoche."

- One third of Tepito's income comes from producing and selling this food. So the aid was actually going to take away the jobs and the income of one third of Tepito's inhabitants - in the guise of help, their economy would be destroyed.

That's a concrete example of the dangers of aid - which seems even more serious to us than the other, well-known problem of its inefficiency. This inefficiency was exemplified by the arrival of a plane full of salt and bean sprouts, which was totally useless and actually very negative, since it took up time, space, and manpower. This type of problem applies to a large part of foreign aid. But the real problem was not so much that it was inefficient, but that it caused structural damage. And unfortunately, we weren't always able to stop these projects.

For its part, the government announced to all these institutions that they should hold on to their aid until Mexico's real needs could be specified. On December 16, a catalogue of projects eligible for international aid was published. What had been retained were projects for rebuilding public edifices, like schools or hospitals - and no direct aid to the victims, who thereby remained under Mexican control. The primary reaction from foreign countries was to withdraw their support, since what they wanted was to help victims, not a government - and certainly not to run the risk of diplomatic conflicts. But some governments chose to give money to their own non-governmental organizations (NGOs), who weren't obliged to follow the advice of the Mexican government. That generated a certain amount of tension, when the government expressed its desire to lock the Mexican organizations into a set framework.

The third critical moment involved the decisions about rebuilding. Now that land had been expropriated, there were lots, there was a government organization, the NGOs were ready to participate, and there was money, several questions emerged: What would be built? Where would it be built? How would it be built? And the overriding question was, would we rebuild on the site, as the victims wanted, or elsewhere?

Thanks to pressure from the victims and the inhabitants overall, most rebuilding was done on-site. Immediately after came the decision as to what type of housing to build. I'd say that was our greatest failure. Neither we nor the government could do a thing against the dictatorship of the professionals. The architects and engineers, even the most open-minded among them, were deeply imbued with the idea that they knew exactly what people needed. We had proposed to create interaction between technicians and the people in order to determine the type of housing people wanted, and we ran into a wall. Our proposal was applied successfully in just a few cases. In fact, there were two erroneous biases at work. The victims were primarily people who had worked miracles to make their horrible lodgings livable. They had never thought about building a house. When someone appears out of the blue and

says, "How do you want your house to be?", their first mental image is a television fantasy. They aren't ready to express what they really want - they dream of what they think of as a rich person's house: like what they've been shown on television. That couldn't fit the specifications of the public office in charge of the problem, since the houses could only have a surface area of 40 square meters. Then the architect came along and said, "How many of you are there? I'll make the plans." It was almost impossible to establish dialogue, and you can see why, because any other approach required a lot more work. What we developed was a sort of Lego system, with little units. People started talking, and bit by bit they built models on the table, so that they could see what it looked like. And it was only then that they would say, "No, that isn't what I want, I prefer this." And they began to build something with the technicians' help. Of course that takes time, and it isn't easy. It requires an unusual attitude from the specialists. So they finally built what was imposed by what we called the dictatorship of the professionals: forty-square meter dwellings in a uniform style - in short, die usual little boxes.

The next decision was about how to build. From the very start, two opposing options had been put forward: traditional self-construction or industrial construction. One of the authors of the Tepito plan, the architect Mariscal, who claimed to be an expert in the field, promptly built several buildings with money from the Red Cross. He did it in about a month and a half, to show that using big entrepreneurs and public works firms was a solution. On the other side were people who thought that individual construction was more efficient and fit in better with the culture and the traditions of the people involved (in Mexico City and across more than half the country, most homes are built by the people themselves).

Here, we had two types of problems. The first was the false image created in the early days. At the beginning there were thousands of volunteers to build houses. We had the impression that we would be able to build the 70,000 or 80,000 units needed. Of course that was a mistake. Furthermore, the dwellings built had to be several stories high, which eliminated traditional self-construction. A family can build a one-story house with no problem, and perhaps, with a great deal of patience, a second story. But you can't build three-story, four-story houses using self-construction.

The second problem was the limited time available. People had to go on earning a living, and they couldn't set aside a whole week to build their housing. So it was out of the question to count entirely on the people directly concerned. Weekends weren't enough. That was the general picture, even though a few experiments in self-construction succeeded (very much behind schedule). For our network, this was a fairly serious problem. On the one hand, we recognized that self-construction was not an adequate approach, but on the other, we also couldn't admit that the solution based on mass construction companies was more appropriate - there were several reasons why it wasn't (e.g. cost of middlemen, inhuman scale). Then some of our

members developed an interesting experiment: they created a technical group to help the victims in the work of rebuilding - effectively bringing the strengths of the industrial solution to the traditional practice. Victims, united in an association, would receive a donation from the outside, and they would direct the operation themselves. To support them, we offered the services of an engineer (who was not their employee) and a group of technicians equipped with computers and other technical equipment for certain critical tasks (calculating soil mechanics or the building's structure, for example). But here, the association verified things and decided whether to pay or not. It was the association that purchased materials - and by making wholesale agreements with producers, we got specific prices for the materials. We then informed the communities of these prices, saying, "If you find a better price, buy there, but otherwise here is where you can buy at this price." This way, prices could be kept down while maintaining decision making power in the hands of the tenants.

Another accomplishment was training the inhabitants so they could participate in the entire building process.

C.C. How were your relations with the NGOs?

G. ESTEVA: At one point, we were working with almost a hundred NGOs. Some experiences were very positive, others very negative. We took various initiatives in this area. The first was my campaign in October, when I went to Europe and the United States to tell people not to send any more aid. And that actually caused a big scandal on the radio and on television. At that point, a number of NGOs came to see us, and we began working together. There was a big discussion on the best way to work with the foreign NGOs. During the same month as my campaign, the network organized a discussion and training session with representatives of the victims to help them evaluate their own capacities, their needs from the outside, and how to choose outside support. On this basis, not only were the groups able to develop their own projects, but they could even train other groups - somebody called them "barefoot planners." They went into the communities to try to help people define their own goals and the relations they wanted to have with institutions and foundations. At the same time, we also took part in a UNICEF forum organized to discuss the role of NGOs.

On the other hand, the attitude of some foundations and NGOs forced the victims and ourselves to refuse their help. We had some very serious disputes with some of them because of the shape their action took. Sometimes it was simply due to how bureaucratic it was, which caused a lot of waste. For example, in December, the Mexican Red Cross had tons of medicines, food, and tents, but it was virtually impossible for victims to receive any of it - they were sometimes asked to present the title to the property of the house that had collapsed, and of course all the papers were inside. In some cases, in addition to the inefficiency, we regretted various forms of religious, ideological, or political manipulation – help was offered in exchange for a commitment. That happened to many neighborhood groups influenced by

political parties that were trying to consolidate their positions. Early in 1986 we were able to select the foreign NGOs we were ready to work with.

CC: What are the main lessons to be learned from this involvement of civil society?

G. ESTEVA: The primary lesson deals with the ability to take autonomous initiatives. This episode was a spectacular demonstration of ability and the capacity of the governed to organize themselves. It suggests that the authorities should design their policies in such a way as to reinforce what the people can do. The key idea is to be complementary, not to substitute. The second lesson casts a small shadow on the first: left to themselves, people can't do everything. Under harsh conditions marked by numerous stresses inherent in the post-accident period, people need outside allies. But those on the outside must respect their independence and at the same time support their initiatives.

A final lesson is related to what we had thought before. The worst catastrophe of all is development that follows the model given by developed countries. In reality, our biggest enemy is development itself, and it is an authentic daily catastrophe.

C.C. And what about the way the network was organized?

G. ESTEVA: The bond that holds us together is friendship - not ideology. The network was an explicitly pluralistic one. It included all religions, all ideologies, all political organizations. There was never a decision-making center, or even an information center. The network was nothing but a pair of telephones that handled the circulation of thousands of dollars and almost a million people.

ENRICO QUARANTELLI

# Thirty years of catastrophe research

## Background

Professor Enrico Quarantelli directs the Disaster Research Center (DRC) at the University of Delaware in Newark, Delaware, the first center in the world to be devoted to studying emergency situations. It was Quarantelli who launched the practice of undertaking systematic, large-scale investigations of catastrophes, beginning with those involving natural events, and more recently, to study technological failures. DRC has analyzed more than 500 accidents all over the world, sending a team of analysts to the scene of the disaster within a few days after the event. E.L. Quarantelli is the author of about 150 books, articles, and reports dealing with this subject.

P.L.: My leading question to you is, what you think of the approach taken in the present work, i.e. what are the advantages and the limits of examining major crises from the past with the people who managed them or were closely implicated?

H. QUARANTELLI: The actor's point of view in a crisis situation should certainly be gotten and is very worthwhile. But there are some limitations to that perspective. The most obvious is the tendency to generalize out to all the world on the basis of one case, particularly when it is a dramatic one.

Related to that is another problem, which is perhaps less obvious and more dangerous. That is the tendency on the part of disaster researchers and planners and all those just talking about disasters, to look to the past rather than to the future. Obviously you has to look to the past in terms of certain direct experiences. But it's essential to keep in mind that the future event can be drastically different. Looking too much to the past can even be dysfunctional. Here's an anecdotal example of how the authorities in New Orleans were caught off guard by a flood when everything was ready for a hurricane:

> New Orleans, Louisiana struggles with an unexpected type of catastrophe: They are very well prepared there to deal with hurricanes, living in an area prone to them. A number of years ago, hurricane Betsy was approaching, and they started making the usual preparations. Among other things, the different public services took all then-trucks and put them in low-lying areas. One of the problems with a hurricane is all the debris in the air, so you want to keep equipment low so it won't be hit. Relief

> organizations such as the Red Cross and the Salvation Army opened up shelters. People usually only spend the night there and leave the next morning. The hurricane came over about 1 or 2 am, and everyone was prepared. Then morning came and they started closing down the shelters. They didn't even give people breakfast, because that's not the normal pattern.
>
> Then they started to discover two things. Because of unusual meteorological conditions, they had a flood inside the city - the water had risen in all the areas below sea level. And the electric and telephone companies lost most of their trucks, which had been put in low-lying areas. Some of the emergency organization headquarters were under water (...) All of a sudden they found themselves with about 60,000 to 80,000 people to evacuate. They couldn't use the old shelters, because these were now under water. Furthermore, at this point they had to worry about feeding people. Now here was a professional group with experience and the like, but they had always thought in terms of hurricanes, and they had a great deal of trouble adjusting their thinking to floods. This is what I mean when I say looking to the past can be dysfunctional.

The third problem is that the perspective of the actors in an organization depends partly on whom you are considering. There's a big difference between the command post director and the man or woman out doing the actual work. The director might say very honestly that he had had no problems in the disaster. The man out working on the street might tell you he had to wait hours before getting some piece of equipment. From his point of view it was a major delay, from the organization's, it was an insignificant matter. So there is always a danger in accepting a perspective as is. You must always take into account whose point of view it is. It's impossible to interview an organization as such; all you can do is interview its members at all different levels.

Another lesson we have learned in disaster research is that experience per se is not necessarily good. Sometimes people can learn the wrong lesson. People occasionally forgot that just because someone has experienced a disaster doesn't mean that he or she acted in the most effective and efficient way. I've been at meetings where people have gone on about what they did, and at a certain point I say to myself, "Good grief, this person learned the wrong thing!" So people can even spread misinformation.

P.L.: Emergency planning as a field is often characterized by a set of ideas set in concrete, that are rarely questioned. Could we look at some of these, based on your experience?

H. QUARANTELLI: One of the first points is the importance of distinguishing between preparedness planning and response management. In the abstract, everybody recognizes this, but often not in practice. You could have very good preparedness planning but you could end up managing the disaster situation really terribly. Planning will only get you so far - then you don't know how given actors will behave in a crisis.

Another point about planning is, you have to distinguish between planning and good planning. The fact that someone has spent a lot of time and resources doesn't necessarily mean the planning is good. As a colleague of mine once said, it takes as much time to write a bad book as a good one!

Another problem in emergency planning, particularly for technological crisis, is the tendency to assume that because you have technological problems, you must find technological answers. The hitch is that within the technological area, the problem itself may not be technological. For example, you might fear a communications problem, so you try to*build in redundant systems. But you are merely dealing with the means. The real issue is who says what over those means. It doesn't matter if you have four different redundant systems, if you don't know what communicators are going to say to each other. So planning can sometimes be off base, when you seek the wrong answers in the wrong places.

In American society, there are two good illustrations of this. It is frequently assumed that you will have to shelter many people in mass shelters. Much time, effort, and resources are spent. The actual fact is that an overwhelming number of people will go instead to friends and relatives. You may plan very well, design many mass shelters - and then nobody comes. The planning has been good at one level, except that it solved a nonexistent problem.

The other example is the maintenance of law and order. There is a concern that people will go crazy and become anti-social in times of disaster. But again, this is nonsense. You could set up all sorts of elaborate roadblocks, security systems, and do it very well, but you would solve a nonexistent problem.

On the other hand, all sorts of problems arise which are often overlooked. In most disasters, two problems are almost invariably badly handled. One is the pass system for roadblocks. Usually what happens is that four or five organizations set up their own passes and ignore one another's systems. This can become a real mess, with the police trying to prevent people from going through, and no one can get anywhere. Or sometimes you have roadblocks and no one can get anywhere because no one has a pass. During the student riots at Ohio State University, they worked out a pass system, but the place where you were supposed to pick up the pass was on campus, inside the roadblocks.

Another problem with planning is the tendency to think you can plan for everything. Sometimes I'm given these huge volumes dealing with emergency planning. You don't even have to open them to know it's terrible. In fact, I've sometimes give an opinion that way, and people reply, "You haven't even opened the book." I say, "No one is going to read anything this big, no one is going to know it." It cannot be good if there's that much detail.

The same goes for simulation exercises - too much is spelled out ahead of time. It's like reading the script of a play. Sometimes in simulations, I've had people show me the pages, and I say, "This isn't very good." And they say, "Why? Everything is spelled out." But that's precisely the problem. You have to train people to cope with the unexpected, to be imaginative and creative, because that's what they're going to have to do at the time of a disaster. Let me draw a parallel. An exercise or simulation should be like a road map. There are many different ways to get from A to B. You must train people to

think about the different options possible. Most children's toys nowadays are not made to have fun with, but to teach children how to think (and I think that's terrible!). But we ought to be able to translate that into our disaster training exercises. Our simulations should train people to be adaptive and creative in developing maps.

Another problem with planning is too often, it forces participants, be they individuals or organizations, to deviate too much from what they would do in an everyday situation. The general principle is: whatever you ask people to do in a time of stress or emergency should be as close as possible to what they do on an everyday basis. If this is the road that most people use to go to work, then don't create an evacuation route that forces them to take a strange road in an unfamiliar place. What makes you think people will use that road?

Basically, then, don't try to force people or organizations to do things they don't normally do. However, there is a qualification on that statement; in some crisis situations you can't do the usual: for example the delivery of emergency medical services. In most places around the world, there are very elaborate everyday emergency medical systems to handle intake from traffic accidents, heart attacks, and so forth. Most emergency medical planning is based on the notion that you can build on the everyday system and simply extrapolate to the mass casualty situation. Unfortunately, this is a case where following the familiar will get you in trouble. When an everyday accident occurs, emergency medical services (EMS) can dispatch an ambulance to a given place and then on to a particular hospital. Entry into the system and movement within the system are controlled. But in a large mass-casualty situation, one of the very first things that happens is the EMS loses control of entries into the system. In fact, as Joseph Scanlon pointed out recently, only 68 of the 400 injured in a recent catastrophe in Edmonton, Canada (July 1st, 1987), were delivered to hospitals by ambulances. The other victims came on their own or were brought by others outside the system. So the system itself loses control of entry into it. From its point of view, people go to the "wrong hospitals", the "wrong way," and so on. In that type of situation, you can't take the everyday system and hope it will work.

Another matter is what criteria have priority. In an everyday situation, for example, speed is very important, but in time of disasters, speed becomes less important than, say, not overloading certain facilities. It's more important to distribute patients well, than to get them somewhere quickly. In fact, in that kind of disaster, the less seriously injured typically get to the hospitals faster than the more seriously injured.

So you come back to the general principle: as much as possible in a disaster, follow the everyday, normal routine, but always be aware that there will be certain instances when you won't be able to do so. That's where good simulations can help: make people learn how to do different things, like using the back stairs instead of the front ones.

Another frequently made erroneous assumption is that the impacted population and officials in groups can't do much for themselves, but basically have to depend on help from the outside. The assumption is people are in a

state of shock, or in the instance of an organization, officials are so concerned about family members that they will abandon their official roles and responsibilities. The overwhelming evidence says this is nonsense. In the great majority of cases people may be frightened, but individuals rise to the occasion. It is clear that the first steps are taken by people on the scene.

At the earthquake in Mexico, the local officials were a bit annoyed about all these search-and-rescue dogs coming from France, the U.S., and elsewhere, whose pictures were all over the papers, because they pointed out that 95% of the rescuing was done within the first two hours, unofficially, by people around when the buildings fell. Even Mexico's own official search-and-rescue groups saved very few people. The dog teams rescued practically no one. There is some evidence that more people were killed in the later rescue effort than were actually rescued. About 100 people died - not victims, but search-rescuers themselves, as buildings continued to collapse.

At any rate, individual victims can be expected to take initiatives. Of course, some people won't show up, but they're the people who don't show up on a regular basis anyhow! There will be exceptions, but I've never encountered even an anecdotal example. The notion mat officials cannot be expected to carry out their work responsibilities simply does not square with the evidence. They will remain on their jobs and carry them out. If they are away, then they'll come back to their jobs.

P.L.: And what about panic?

H. QUARANTELLI: If by panic you mean hysteria or wildly fleeing from a place, that is simply not true. Very few people become hysterical, and panic is not a real issue. Unfortunately, people give "panic" many different meanings. If by panic you mean that people are scared, that's true. But in a disaster most people are quite rational, even though they're very frightened. Somehow they manage to keep their organization functioning. There are limited circumstances in which panic may occur in a crowded enclave. For example, there was a big fire at the Beverly Hills Night Club in Kentucky (May 28, 1977) and the University of Cincinnati did a careful study of those who survived. What emerged was that the overwhelming majority of people helped each other. Panic flight in the sense of competition or people trampling over each other simply did not occur. Especially when social ties (people with their families and friends) are present, then most everybody tries to help one another. I won't deny that there's a lot of post-disaster conflict, but at the time of crisis, almost everybody tries to help each other.

P.L.: Could we move now from the problem of planning to managing the crisis itself?

H. QUARANTELLI: I think we do have some ideas of where the managing problems lie. There are four kinds, the first of which is processing information (this is larger than a simple transmission problem).

One of the major problems in a disaster is the lack of accurate information. Sometimes the problem is very comparable to military intelligence. You have much information but you don't know which is correct, and you have difficulty assessing that which is valid. By the way, in

future disasters we will have an information overload problem, because we are putting in so many computers. Among other things, computers are going to generate much more information, which means it will be a lot more difficult to interpret that information. I have nothing against using computers - they are valuable in preparedness planning and response, but some of the problems have been overlooked.

Processing information within an organization becomes difficult in times of disaster because very often, you have more people around. People are suddenly communicating with unfamiliar faces - so there are organizational problems for obvious reasons. Shift organizations (hospitals, police) are particularly prone to these problems, because in emergencies, they bring in the second and third shifts. When you talk to people who have been involved in large-scale disasters, they tell you how surprised they were at how many unfamiliar groups turned up. They wonder where everyone came from! Again, that is veering away from the usual. You have unfamiliar organizations dealing with other unfamiliar organizations.

Another typical problem involves organizations communicating with the public. Most organizations do this on an everyday basis, but along very limited lines. Consequently, when a very serious problem arises, they don't know what to do. The system can be totally swamped. Problems also come from the public communicating with organizations, because the public has its own ideas of whom to call, and as far as the planning is concerned no one calls the "right" people.

When talking about systems, we shouldn't forget that many elements of communities are not isolated organizations, they are linked together in a system. Take emergency medical services: we're talking about the involvement of public and private hospitals, of ambulances, of police and fire departments. These are not simply a number of separate organizations, they're all interlocking. At the time of disaster, trying to deal with the problem of system communications at a purely organizational level misses the point. Information must be processed by the system, and without the right information circulating, the system cannot work. For example, in a recent tornado in Cincinnati (April 3, 1974) several hospitals didn't report to the communications center, so the system didn't know those beds were available, and therefore couldn't distribute patients to them. And you have to realize that systems are more and more involved, particularly in technical disasters.

Another problematical area is the exercise of authority. Actually, we should use another word, because authority implies that "we are in control". Instead we should talk about decision-making. What's wrong with authority is it assumes you need a centralized decision point in a crisis, like in the military. I like to point out that any one who has ever been in the military knows that in reality the military doesn't operate that way, either.

> Let me give another anecdote: I was in Alaska right after the earthquake in 1964. One day I walked up to a command post on an air force base in Anchorage where some some military officers were operating radios and telephones, seemingly passing on

> requests from civilian officials who came up to them asking for equipment or supplies. But I was puzzled by what I observed in the first hour. A major, for example, got on the radio, said he needed a 3/4 ton truck at a particular point. Then 50 minutes later he went to the telephone and made the same request. This happened for a number of requests. There seemed to be two different communication channels. The major later explained to me, "The Anchorage city official can't just come up to me and request something. He has to go to his department head, the department head goes to the mayor, the mayor contacts the air force commander. Then the commander goes down his chain of command and contacts the garage, and then word goes all the way back up the chain, saying the truck is on its way. We tried doing it that way. but it didn't work." So they had developed two channels of communication, the official one and the unofficial one. They felt they had to do the thing required by their chain of command, but they were also cutting across in a very functional and intelligent way. A very old notion, and one of the problems with bureaucracies, is that things have to be done from the top down. Sometimes they can be done from the bottom up, and sometimes they can work through the middle level.

Along the same lines, people often pretend that the practice set out in the plan is always the one used. But how can that be true in a disaster, if it isn't even the case in normal times? That's how things work, despite efforts made to cover up differences between the letter of the law and its application. For example, in the emergency room, nurses are prohibited by law from taking certain medical actions. In actuality, they take those actions on an everyday basis, and all the more so in a disaster. Once we had some physicians from the American Medical Association come with us to a disaster site, and they saw some nurses doing these things. They looked scandalized. I pointed out to them that they couldn't be that naive! And they admitted off the record that the nurses did sometimes do those things. Again, just because you don't follow the official path doesn't mean what you are doing is dysfunctional.

The third major problema area is coordination. Coordination is a golden word. We'll leave aside the fact that one person idea of coordination may be totally different from someone else's. One person means, "I'll tell you what I'm doing," (which is really informing). Somebody else means, "I'll tell everybody else what they're doing," (which is really controlling).

Now we have to clear up an old myth. How much coordination you want depends on what your goal is, and you can actually sacrifice a certain amount. It depends on the difference between the words effectiveness and efficiency. Efficient means there's the resources are well matched to the problem. On the other hand, you can sometimes effectively solve the problem in an inefficient way, by tossing many things at the problem, even if you overuse resources. As far as I can tell, this is how the Mexicans did a fairly good job in the natural gas explosion and in the earthquake. They were not very efficient, but because they threw so many resources at the problem, they ended up by being effective. The point is, if you want efficiency, then you need coordination. On the other hand, if effectiveness is more what you want and you are willing to sacrifice efficiency, then coordination is less of an issue, because all that matters is to get from A to B one way or another. I try to emphasize this,

because everybody thinks coordination is necessarily good. To coordinate for the sake of coordination is ridiculous.

There is also no way in any large-scale disaster that you are going to have excellent coordination. The best you can have is a degree of good coordination. One of the hallmarks of a large-scale disaster is that there is a tremendous convergence of organizations at different levels: local, community, regional, national, very often international. The notion that you can somehow totally coordinate all those entities is simply an absurdity. I'm not arguing against coordination - I'm being realistic and recognizing how much you can hope to achieve. Coordination is not the goal in a disaster. The goal is to manage the problem.

Finally, the fourth problem is that of mobilizing resources. We fail to recognize in many cases that this does not mean finding new resources. The resources are usually there, unless a catastrophic disaster has laid everything to waste for miles around. It is remarkable what resources are available in a modern, everyday community. They may not be where you normally think they are, but they're there. Again, it isn't a question of finding manpower, it's one of organizing that manpower. Many people who are victims could be very well used. In fact, they're the best people to use, because they are local, they know the local situation, and so forth. So it's a usually a question of organizing and mobilizing existing resources rather than creating new ones. Occasionally an incident may require some specialized expert or piece of equipment. But in the overwhelming majority of disasters, the real problem is that poor planning in the first place failed to identify resources around, and poor managing in the second place failed to take advantage of what was there.

This is one area where computers could come in very handy, because you can store many facts in them about where resources are located for when a disaster happens, assuming the computer continues to function. That's a strategic step you can take ahead of time. You shouldn't have to hunt around at the time of a disaster. With computers you could create databanks on a local level. You could have evacuation routes programmed in, for example, and then the computer would calculate how much road capability there is, what the meteorological factors are, and so on. We haven't seen much evidence of how helpful computers could be because they are a tool which is only beginning to spread. In the future they should work out very well, unless of course people become too dependent on them and stop using their common sense.

There is also a risk involved in computers without redundant systems. To give an example, I know a plant in Louisiana that was highly computerized, but when the computers were knocked out by an explosion, the monitoring system went out too, so they didn't know what kind of a threat they had. The monitor screens were blank, so they didn't know where the explosion had occurred. In the old days they would have had people at the various monitoring points, but now they rely on machines. In this case, they had to hunt around for quite a while for a couple of experienced workers who then

went into the area and tried to measure what was going on, and it took them hours.

P.L.: Very often the key point in a disaster is that the managers themselves don't know what to do.

H. QUARANTELLI: Part of this stems from poor preparedness planning. I'll tell you what I told an international group of disaster safety managers. I asked them whether in simulation exercises, the people participating are those who would be called in on an actual crisis. Most of them said no - they couldn't ask the plant superintendent or company vice president to come to simulations. But it doesn't matter that these people are superintendents or vice-presidents or prime ministers. The point is, who will be expected to make decisions in a real disaster? But it's very hard to train high-ranking people to think about these issues ahead of time. Part of the problem here is that even in a disaster situation there are political considerations, and what a leader does or does not do is more often dictated by political considerations than by the disaster plan.

P.L.: As our systems become increasingly complex, they will require more and more long-term planning. What can be done to encourage both private and public bureaucracies to tackle this task?

H. QUARANTELLI: The strategy here is to point out the long-term consequences. If you can point out that inaction can lead to terrible consequences, you can sometimes get action. In the United States, until quite recently most government officials could not be held responsible for their failure to take preventive measures in terms of hazards and dangers. Generally speaking, that is still the principle, but more and more laws are being passed that deprive officials of this immunity. That's going to force them to act. In terms of private organizations, the threat of law suits is already pretty well known in the nuclear and chemical industries, and it has moved many companies into action. Because even if the steps you take don't work, at least you can't be blamed for having been totally negligent.

To summarize, at least three elements are involved which make these situations extremely complicated:

1. Political considerations, both domestic and international. There is nothing wrong with politicians' paying attention to them, but that very often means they're boxed in when it comes to taking decisive actions. It's all very well to ask them to be courageous, but if they act, they may no longer be leading the crowd.
2. The bureaucratic problem. The political apparatus is closely intermingled with administrative bureaucracy. We know from studies that the way bureaucracies generally handle potential problems is to set them aside, in the hope they won't occur. All this works against planning and worrying about low-probability risk.
3. Organizational problems, along the lines I've already discussed.

P.L.: But the public often reacts by simply losing confidence.

H. QUARANTELLI: It's also worth looking at the relationship built up with the public. Especially in a democratic country, you have to pay attention to

citizens as a whole. But on the other hand, there's the problem of public indifference. For example, California has great earthquake planning partly because at one point an influential state senator - the head of the finance committee - took a great interest in it as a kind of pet hobby. The average citizen isn't very concerned about it.

But we should perhaps question bureaucratic practices, which are always strongly defended with the tacit implication that the public must simply learn to live with those decisions. The average citizen has a role to play, too. This is what I tried to explain to the weather services in Miami, during a conference they held on hurricanes. They wanted me to talk about why people didn't pay attention to warnings given by forecasters. I told them I would come to the conference, but that they were asking the question the wrong way. The real question was, "Why doesn't the weather service issue warnings that people will pay attention to?" The weather service people weren't too pleased at that, and one of the top officials told me afterwards, "We disagree with what you said, but I'll think about it." To his credit, he did, and within about six months he decided the problem was not the public, but the weather service.

Finally, there is also the typical political and bureaucratic behavior of keeping things closed and secret, especially when there is ideological opposition, as in the nuclear field. Actually, evidence shows that openness seems to operate much better - not because it's a democratic value, but because it's more pragmatic. But it's very difficult to convince bureaucrats and politicians of this.

PART THREE

# *Landmarks for Action*
# *Questions about Management*

The accounts we have just read suggest guidelines for action that are sometimes complementary, sometimes contradictory. They also raise a great many questions that lead into a discussion of some substance. Given the urgency of the issue, the pressing need to propose rapid responses when an incident occurs, and above all, the anxiety such incidents cause, it seems most helpful at this point to attempt to sort through and synthesize these elements in order to suggest specific, proven steps that are sure to succeed.

However, the goal of this book is not to produce a crisis management how-to guide. At present, our understanding of the multiple facets of this problem is still insufficient to be able to define specific, positive operating rules. But we can offer something else. Experience - whether acquired in real situations or simulations - has taught us that the primary difficulty today lies not so much in the how-to, but long before this tactical question arises. Even with the best possible manuals, we would still often remain mired in difficulty.

On the one hand, underlying mechanisms lead us almost naturally into the most conventional briar patches as soon as a crisis breaks - and they have quickly done with our golden rules of crisis behavior. It is more urgent to identify these mechanisms so they can be avoided. Only then can we find other approaches, which could even be invented on a case-by-case basis - that isn't hardest task.

On the other hand, the questions raised by technological crisis in an age of major hazards cannot be simplified easily. The question is complex (because of the many variables and possible combinations thereof), typified by its exceptional nature (since the event may brutally alter the reference context); it cannot be neatly pigeon-holed (since technical aspects and social factors overlap constantly), and it opens up awe-inspiring issues (How should technology be used? How can democracy be preserved?). As a result, there are no simple answers. A how-to manual in this case would be somewhat like the bolt held up by the American specialists 24 hours after the Chicago DC-10 accident, offering *the* solution to the riddle. But here as well, the truth is not so simple.

This chapter is therefore not entitled, "Crisis Management from A to Z", even though such a collection of recipes would be welcomed to soothe

anxious expectations and could ride the wave of a growing fashion. To the contrary, we will apply the standard to this research that has emerged from the general approach to crisis situations: when everything points toward simplification, that is precisely the moment when an effort should be made to look deeper and widen the discussion.

This is why we have chosen not to conclude this reflection, but to extend it, along two lines: removing the roadblocks that paralyze action, and discerning the perspectives that will lead to a deeper understanding.

# 5. Getting disentangled from failure's briar patch

No innovative recommendation can be heard, let alone followed, unless the profound roadblocks built into mentalities are broken down. We have encountered these hindrances at all stages of crisis management: before any accident takes place, at the moment the event strikes, and in the long period during which the crisis develops. It is these issues, more than any specific intervention tactics, that must make up the core of the training programs that are called for today and for which there is a strong demand. We must never lose sight of the fact that the key lies in mental dispositions and in habit - these command everything else.

## 1. Overcoming fears

*Augsburg, its ramparts, its guards, and its fears:*

"In the 16th century, it wasn't easy to enter Augsburg at night. The French philosopher Montaigne, who visited the city in 1580, marvelled at the "false gate" with two guards used to filter travellers arriving after nightfall (...). These were precautions that revealed a singular climate of insecurity: four successive heavy gates, a bridge over a moat, a drawbridge, and an iron grid were not considered too much to protect this city of 60,000 - at the time the most populous and richest in Germany - from any surprises. In a country that was prey to religious quarrels, with the Turk roaming at the borders of the empire, any stranger was suspicious, especially at night. At the same time, there were worries about the commoner, whose emotions were unpredictable and dangerous. So it was arranged that he should never notice the absence of the soldiers usually stationed under the complicated system of the false gate. Inside this gate, the latest advances of German metallurgy had been installed; thanks to them, a highly coveted city managed, if not to thrust fear completely outside its walls, then at least to weaken it sufficiently to be able to live with it.

The clever mechanisms that once protected the inhabitants of Augsburg have a symbolic value. Not only individuals taken one by one, but also groups and even civilizations are engaged in a permanent dialogue with fear" (1).

Fear: this is the most immediately perceptible aspect, as soon as the question of technological crisis is raised. We tend to laugh at its presence in the "ignorant citizen" - but we are still wary of the "commoner, with his unpredictable and dangerous emotions".

But fear also knows how to make a place for itself among the leadership. It has many faces. There is fear of the major hazard itself, or more often, of the anguish its appearance will provoke in public opinion; fear of the little breakdowns that could stimulate "mindless concern" in the public; fear of the non-event that will make rational beings feel and state their impotence; fear of panic; fear of a cover-up; fear of the expert, only too prompt to confuse truth and opportunity; fear of the scientist, more fond of discussion than decision; fear of the journalist, that modern-day barbarian ever ready to storm the citadel and tear down its walls; fear of the citizen, only too happy to take a jab at any authority figure; fear of your own peers, and of deviating from what is expected of a leader; fear of those friends and colleagues ready to take your place, and fear of yourself in a crisis: of course you've been trained to apply the recognized optimal solution to every recognized problem, all other factors being equal. But suddenly, you find yourself in a fog where, at least at first glance, the optimization tables have been replaced by the wheel of fortune.

In order to live with fear, organizations construct defensive ramparts. Until very recently, anyone who asked "unfounded" questions was subject to deep suspicion. Before an accident, you mustn't yield to defeatism; after the accident, fighting against soothing forgetfulness would be indecent. Within the walls, deep-rooted beliefs and attitudes have become established and are held up as inviolable dogma:

- Thou shalt not doubt for a single moment the intrinsic safety of the products, processes, and activities for which you are responsible.
- Thou shalt protect the firm from external attacks led by opponents (be they journalists, associations, elected officials, or others) who are totally ignorant of industrial issues and who pursue unacceptable, secret goals.

Such dispositions offered some protection yesterday, but today they lead directly to failure. In an infinitely more open society than was previously the case, such defenses have become a sort of Maginot line. Furthermore, their very existence is often the cause of an instantaneous collapse. The diagnosis is clear: unbounded fear makes it impossible to manage crisis - it even pushes its victims inevitably further down slippery slopes. This is why work is being done in many areas today to transform this thin-skinned attitude based on pulling into the shell and on responding with self-sufficiency and aggressiveness to anything that moves (without or within). But the legacy of the past is heavy, and cultural revolutions do not happen overnight.

The classical line therefore often still leads to failure through fear. The following example bears witness to the fact, showing clearly that crises can be built out of nothing more than fear itself.

*Simulation of a nuclear accident, May 6-7,1987:*

One year after Chernobyl, French public authorities organized a very conventional crisis drill, whose sole exceptional feature was that the post-accident phase extending over the month following the accident would also be simulated. The Chernobyl experience had clearly revealed that this could be the most delicate period. This meant the accident scenario chosen had to be sufficiently dramatic to provoke a significant breakdown in the operating efficiency of the power plant at the center of the exercise, even if this meant adopting what seemed to be excessively pessimistic hypotheses. Another major innovation was to incorporate a simulation of the media response, to be handled by two journalists. The government agency in charge of nuclear safety designated an expert in crisis management and two journalists who had already worked on similar projects to organize this aspect of the drill.

Because this type of exercise was designed during numerous meetings of the various agencies involved, feelings on how to handle information policy varied widely. Some even questioned the utility of the whole operation, since recent problems with nuclear reactors on French soil created a negative context for the drill.

The whole exercise was characterized by one attitude: outside the technical organizations directly responsible for nuclear energy (i.e. EDF and the French atomic energy commission), fear of journalists was obsessional. One fixation developed around the issue of the final press release to be given at the conclusion of the exercise. From the very start, the outside participants had insisted that this "first" - a large-scale simulation of a nuclear incident — could not be considered successful without this overture to the press. Given the errors made in the past (and the French government's handling of Chernobyl had been bad enough), given the repeated assurances about being more open, given popular expectations, the need to change thinking within the organizations in question, and the professional position of outside participants, nobody could afford to remain silent - unless they wanted to run the risk of seeing new accusations of dissimulation brandished against them, with headlines like "Shrouded in secrecy, the government trains to be more open".

As if to prove the accuracy of this idea, various press organs began to talk about the planned exercise. This in itself was no surprise, given the number of agencies involved - and public expectations in this area. The government official leading the project finally moved to guarantee that the overture would take place: a meeting with a few journalists was to be held on the second and final day of the drill. Then, less than a week before the exercise, fear of the media helped push through a new decision overriding this official's decision: the final press meeting was cancelled. At that point the outside participants withdrew from the operation, thereby cancelling the media aspect of the drill, until harsh negotiations won acceptance for an encounter with 20 or 30 journalists. But fear still held the high ground: just after the invitations to the press encounter following the drill had been sent, a final decision was handed down to the drill's organizer: no meeting with journalists. Once again, the press was called, to cancel the invitation.

What a successful ploy! Hordes of journalists came running. When they arrived, already surprised at this non-invitation, they had no trouble discerning the strange atmosphere created by fear.

Worst of all, fear - or rather fears, each with a different face - leaves its imprint on"< every link in the chain of reactions, from preparations for emergency situations to the final handling of events and their consequences. Some reactions are so caricatural that they are actually revealing of how far we have to go. In a lecture hall (where the presence of large groups highlights

the defensive mechanism), it is not at all unusual to see a conference of top executives suddenly tremble when a speaker mentions a blatant error made by a journalist. Fear of "the other" is often greater than the capacity for taking one's distances from an event.

But of course the problem is not that simple. We are actually seeing cybernetic processes at work: a manager's reticences can also be explained by his or her fears of other partners, whose own worries heighten as the manager's fears become more pronounced. On the other side of the fence, the fears are equally deep-rooted: fear of catastrophe, fear of officials who seem to be primarily concerned with the survival of their company or their administration, i.e. with ensuring technological continuity, economic stability, or law and order.

To break out of these vicious circles, the best approach is doubtless to move step by step, building on successive achievements while advancing towards increasing the safety of technological systems and raising the awareness of all the actors involved. Calling fear by its name, identifying the difficulties, listing distracting non-issues, and raising questions that remain to be discussed and solved - all these demands must be met as part of a collective learning process intended, naturally, to lead to a real control of risks and vulnerability.

The pilot operation in the Isère region of France, mentioned earlier by Haroun Tazieff, offers an interesting application of this perspective. It successfully combined inventorying risks, searching for concrete measures, and informing various populations. It was founded on the participation of numerous businesses and public agencies, including the press, and even groups critical of this approach (2). As the Minister of the Environment emphasized, its primary interest lay in "the dynamic it created" (3).

To return to the image of Augsburg, the besieged city, the foremost goal we should pursue is to transform our risk-filled civilization so that we no longer feel we are living in a state of siege. When our dialogue with fear becomes obsessional, life is nothing but a nightmare. Then any behavior, however studied, can only provide a trigger for a chain reaction of mishaps.

Nevertheless, this goal is hard to reach, because fear isn't just a pure manifestation of irrationality. It is indeed illusory to think high-risk systems can be totally controlled. In short, while it is possible and desirable to tame fear, it is impossible - and even dangerous - to throw this natural alarm system overboard. This is the archetype of the ambiguous and irreducible issues that will be raised in the final chapter. As always, major hazards cannot be considered as if their various elements could be sealed in separate, leak-proof drums.

## 2. Moving beyond imaginary defenses

*Notes from visits to a few crisis centers*

In the suburbs of Paris, at a fire department emergency center: "Of course we have plans, but you have to recognize their limits. For a marshalling yard, for example: if chemicals are involved, the only solutions we have is often whatever is available (the national railroads consider themselves as suppliers of leased equipment and not as operators, so we're on our own). The employees on site have no decision-making power, and it takes a long time to get ahold of someone who understands the problem. There is no retention basin onto which we could tow a damaged wagon. The manifest indicating the nature of the chemicals transported is often illegible."

Valabre, France, north of Marseille: "You are standing in the only operational center for interregional emergency management."

London, a nuclear emergency center: "This is our crisis room: 20 meters long, 5 meters wide. And as you can see, there are at least 25 telephones! This is where we would operate if there were a serious accident."

Washington, an administration responsible for emergency preparedness: "These are the reference rules to be followed in case of crisis." (Our host shows us several pounds of paper.) We ask, "You wouldn't happen to have a short document outlining your policy and how it works?"

Bethesda, Maryland, a nuclear crisis management center: "We are in the process of designing our crisis room. The key idea is, how are these people going to work? Based on that, what should the interior architecture be, how should offices (windows, observation areas, etc.) be arranged?

Harwell, west of London: "We are in an emergency response center for handling chemical transportation accidents. We have substantial computer equipment and a large data bank on chemical products. But we have also given priority to developing emergency micro-computer tools. Businesses and firefighters can request floppy disks and can train at their own rhythm (the firemen especially enjoy this, because it offers a very useful and stimulating activity to fill their hours on duty). Another detail : we also have non-dangerous products in memory, because these can also cause crises. (Recently, some unidentified white powder was found on a beach: how could we know whether the fact that the substance didn't appear in our references meant it wasn't dangerous? As you can imagine, the situation rapidly becomes delicate.)

Washington D.C., at Chemtrec: "This is a communications center financed by the industry for handling chemical emergencies in case of transportation accidents. We operate around the clock, and we receive ten of thousands of calls per year. We can establish simultaneous telephone hook-ups among some 20 experts all across North America. When there was an accident in Louisiana, this telephone conferencing system worked non-stop for 19 hours".

This tour of a range of emergency centers is instructive (4) (5). What are its essential lessons? The main regrettable weakness is quite simply the frequent absence of a minimal level of equipment. But we must look beyond hardware alone and analyze these tools in terms of their effective operation. Everybody - and not just the major crisis centers - must be particularly aware of the slippery slope that we can slide down so easily, i.e. the tendency to produce illusory protections. This regularly takes the shape of flow charts and plans whose bulk doesn't necessarily correspond to their pertinence. Another criterion that should turn on a warning light is any insistence on the definitive quality of such documents, which often masks a degree of unpreparedness.

After the Mississauga incident, the police force in the affected region received countless requests from agencies wishing to receive the emergency plan used there. Yet the secret behind the unprecedented success of this ïarge-scale operation did not lie in the document. Everything hinged on the life breathed into these plans (which were fairly conventional): a general policy of observing risks and vulnerability, frequent exercises, careful analyses of experience, effective involvement of people at the top of the hierarchy, and a joint effort carried out by many partners. For years, everyone involved had been preoccupied with translating the keywords - trust and competence - into something real.

This is in fact Mississauga's fundamental lesson: the secret lies in the quality of the processes set in motion, and not in the plans themselves. As a counterpoint, the following example is drawn from outside our field but is highly suggestive. Maurice Grimaud, chief of Paris police forces during the student and popular uprisings in May 1968, tells how he discovered the emergency plans, conscientiously filed and forgotten.

*Mythical organizations: Emergency plans in May 1968:*

"In our morning meetings at the Prime Minister's offices, I was surprised to learn how all the major government services had been caught off guard by events and found themselves helpless in the face of accumulating difficulties. Not that we hadn't made very lovely plans long before to guarantee that these services would go on functioning in case of trouble or a general strike. Rather, none of these plans worked, primarily because no one had ever tested them.

There was a plan to guarantee a minimal train service, and one for civil aviation, and another for transporting fuel and supplying the cities, and for maintaining radio and television broadcasts. All of them, to be effective, presupposed that electric power plants and the grid would be in working order, because without electricity and telephones, all the others would grind to a halt. These plans had been studied down to the last detail by administrative units combining civil servants and military men. They were based on assistance from the army and on requisitioning certain categories of public service agents. But once signed and stamped with "Secret" seals, they were apparently all locked carefully in the safes full of confidential documents located in each ministry, and they had gathered dust there until today. It wasn't just by coincidence that they generally bore names inspired by mythology - rarely was an organization more mythical than that one" (6).

*Perspectives*

The key lies in building a continuously-oiled system whose capacity for changing speeds is tested regularly. A plan should be the picture on paper of a real capacity for action and interaction among numerous actors - from industry leaders and public authorities down to individual citizens, via various groups and associations.

This is precisely what industrial, municipal, and administrative leaders did, on their own level, around the Rhône-Poulenc chemical plant near Grenoble, France. Their multi-leveled action included continuous information given to the population, through public meetings, press articles, and brochures distributed to inform the citizenry of how to proceed in case of a chemical accident (7). The case is now considered a model in the field. Unfortunately, it is only too rarely followed in Europe, despite the obligation to provide information laid out in the European Community's directive on major accident hazards, the so-called Seveso directive. (In June 1982, the European Community chose to adopt a legal instrument, the Seveso directive, in order to deal with major accident hazards incurred by some industrial activities. This directive required that installations fulfilling certain criteria were to be notified to the administration, and that notification had to include a survey of safety conditions in the installation in question. Article 8 of the directive stated that "Member States shall ensure that persons liable to be affected by a major accident originated in a notified industrial activity (...) are informed in an appropriate manner of the safety measures and of the correct behavior to adopt in the event of an accident.")[1]

This is where the stakes are the highest: beyond a very fashionable discourse on technological hazards, beyond the plans that must be prepared, are we ready to undertake the substantial transformations that will necessarily entail changes in everyone's habits and priorities? One of the first steps to take (or to move towards) involves modifying this inherited culture consisting of taking a myopic view of risk problems and of closing off the outside world. Without changes on this level, all our emergency plans will never be anything but paper.

Top management and administration have heavy responsibilities in this area. Their job is to:

- confirm the importance attributed to questions of safety and crisis management;
- show, by the decisions they make, the stock they put in this issue;
- open up discussion on these subjects with the main partners outside the organization (without neglecting partners on the inside, such as safety committees and unions).

All this requires a tremendous capacity for innovation and for repositioning organizations so that they will be perceived and represented as

1. See European Communities Council: Council Directive of 24 June 1982 on the major accident hazards of certain industrial activities, Official Journal of the European Communities, 5.8.1982.

real partners in activities involving multiple agents, rather than "citadels" constantly seeking to protect themselves from the outside world. The chairman of Electricité de France recently summed up his position quite clearly: "We have to make glasnost work for us as well" (Europe 1 radio, September 30, 1987). This evolutionary development will be necessary in order to muster enough force to face the challenge of major hazards and crisis situations. Johnson & Johnson's top management was fully aware that what gave it the strength to cope with the crises the firm faced were the principles of openness and responsibility laid out in its charter. Furthermore, this charter wasn't something foreign to the company's culture. This explains why the company was not defeated by cyanide slipped into a few capsules of Tylenol (8).

Once this imperative of lucidity and openness becomes inherent in the very life of an organization, it is possible to make considerable progress in the quality of major hazard prevention. Building on this truly solid base, crisis management measures can be developed which are themselves much more resistant.

### 3. When the crisis strikes, avoid yielding to immediate defeat

As the preceding arguments have shown, post-accidental situations are tremendously diverse, and they contain formidable pitfalls. It is an illusion to imagine that prescribing simple remedies can prevent every situation from getting out of hand. However, the prescriptions for guaranteeing failure are very simple, and we have examined their many ingredients in the previous chapters, with breakdowns in public communications doubtless marking the high road to defeat. Remaining silent, persistently denying the presence of risk, fighting a rearguard battle against information, or simply rejecting everything (to the point of being provocative through denial) are all key chapters in this anti-manual that could also be entitled, "May the best one lose" or "Suicide, a how-to guide." There are many roads to defeat, but they all follow two main axes:

- constructing a state of confusion in which truth and falsehood are as elusive as the officials in charge;
- displaying this state of confusion to those curious observers convinced, in the light of official faux pas, that any line of interrogation will lead to an unending series of new revelations.

With that, we are almost certain of digging ourselves into a hole in which any technical margin for manœuvre, any credibility, legitimacy, or dignity will soon be swallowed up. How can these reflexes be reoriented ? Without offering a book of home remedies, we can identify a few landmarks.

*Getting critical information instantly to the top*

Organization rules must be specified concerning the internal distribution of sensitive information. In the organizations most advanced in this field, any significant breakdown is immediately reported not only to a permanent technical watch, but also to a permanent organization in charge of external communication - and to a top manager, or even the executive office of the organization.

> *Union Carbide:* any significant incident, i.e. one necessitating a rapid decision at a top management level or which could be extensively publicized, must be notified quickly to the group's upper-level management. Such incidents have been specified to include:
> - multiple fatality accident,
> - explosion or fire likely to result in national publicity,
> - bomb explosion or finding an explosive device placed in or near a Union Carbide facility,
> - product spill or other environmental accident (...),
> - any threat or allegation relating to the facilities or personnel of the corporation likely to result in national publicity or demanding a prompt corporate decision (9).

But here again, even if the rules for getting information to the top have been clearly stated, the most natural tendency in this area is to do exactly the opposite. Actors tend instead to:

- hold onto critical information, whatever instructions have been given, and to hold on even tighter if the data to be transmitted is troubling;
- not only to pass this information on too late, but to do so hastily and almost secretively, without verifying that it has reached its destination;
- avoid alerting high-ranking officials.

Without training that puts those concerned in a position to feel the strength of these natural tendencies, there is every reason to fear that few persons will follow instructions for immediately transmitting hot information.

*Moving quickly to establish contact with the outside*

Providing information and building bridges toward all the partners involved, and especially the media - these are the two fundamental requirements. Here again, rules must be laid down and adopted by the organization as part of its fundamental policy. One example in this area is how Dow Chemical Canada determines what information is to be given to the media, the most difficult aspect of information policy.

> Donald R. Stephenson, Director of Communications at Dow Chemical, Canada, has clearly set out lessons learned by his company from a certain number of crises: "1. The public must be informed frequently and accurately through the media, from the outset. This must be done by one or two highly credible senior spokesmen who understand the situation and can explain it calmly and clearly in lay language. The first 24 hours of a crisis are critical.

2. If this is not done, a public information vacuum probably will develop rapidly - and be filled by rumors or alarms far worse than the real situation.
3. Silence in the midst of a crisis implies guilt, whether justified or not.
4. It is not enough merely to assure the public that everything is OK and there's no reason for alarm. To be credible, we must provide details of how that conclusion is drawn.
5. It is vital to realize that reporters face deadlines hour by hour. Information must always be correct, consistent, and current, even if all the answers aren't immediately available" (10).

This brings us to a point drawn from our own experience: as soon as you can feel a zone of turbulence approaching, communication lines with the outside must be opened immediately. Then, when the turmoil hits (usually much sooner than anyone expects), these lines become a precious asset. Using a channel that has already been opened, calling back a contact who was already warned is infinitely less difficult than trying to establish communication as time and events begin to accelerate. What's more, the simple fact of taking initiative early on is a sign of confidence that can prove very useful.

But once more, in a turbulent setting, no one should forget that whatever the official rules say, there is a natural tendency to:

- withdraw into the wagon circle of the organization, and even into little groups within the organization;
- put off thinking about the initiatives that must be taken to build a network of contacts with the outside world;
- run away from dealing with the press.

Experience has shown that the game is almost entirely played out within the first moments. A filtering prism is set in place almost instantly, through which everything done and said henceforth by the organization will be perceived. Any delay, hesitation, or worse - any dissimulation or lies that can be proved at the start will become a handicap impossible to remove later on. Without training, without regular prior contacts with the main actors on the outside, it will be a laborious task for an organization to apply a policy of rapid openness. This is the general rule once more: no crisis can be managed without prior preparation. This is all the more necessary because mistakes are always possible - and if you are perceived as being unwilling to communicate, then every error will be seen as the sign of evil intentions.

It should be specified that because a crisis, as we have seen, has a time dimension, it demands more than one-shot information at the time-equals-zero mark: it requires working continuously with the external networks. This in turn implies long-term exchanges, previously established trust that is reconfirmed at the start of the problem, a clear distribution of responsibility, and more. All these conditions require more than simply prescribing rules: they call for an organizational culture largely open to the outside. Of course handling the media problems of which we are so aware today isn't the only purpose of this openness: it should be practiced with regard to all publics and all partners involved.

*Detecting potential crisis situations early*

Each organization has to develop its own capacity for deciphering potentially delicate situations. Several parameters should be listed and measured at the command post:

- What types of risks are possible or plausible?
- How long could the phenomenon last?
- Do results of analyses or the degree of uncertainty vary? Are there conflicting points of view among experts?
- How are relations among various agents and especially, how much trust exists among actors?

Experience has shown that those actors most directly involved often have a hard time realizing that they are in a potential crisis situation. Here again, deep-seated mechanisms seem to intervene almost automatically and inflict a sort of myopia on everyone. This means broader alarm systems must be planned that will incorporate other hierarchical levels within the organization, or even outside observers, as has been done on occasion.

Once such a dynamic is set in motion, it becomes possible to make use of technical and organizational crisis management resources, such as crisis teams, crisis centers, and press rooms. These will immediately provide support in coming to grips with the long process of post-accident turbulence.

## 4. Dealing with the crisis over time

Once again, there is no simple model in this area that offers easy resolution for crisis situations. Difficulty, uncertainty, and ambiguity form the core of any crisis. However, it is possible to get ourselves pointed in the right direction. Fundamentally, efforts must be concentrated on:

- developing coherency, at a time when the system is being torn apart by the forces described above;
- focusing on goals, even when they tend to get lost in the confusion;
- maintaining credibility, an essential factor for active management of the event.

More than applying specific rules, it is important to survey the overall reaction of the system attentively. The task of administrative staffs or top management is to follow the development of post-accident dynamics closely and to pay particular attention to those points that regularly constitute weak links in their response to a crisis. This effort to remain vigilant and in control at the highest levels should include:

- constantly tracking down and pinpointing any gross mistakes made by the organization or network of organizations involved, with a view toward taking

immediate corrective measures. If this is not done, tiny cracks in the edifice can rapidly become yawning gulfs that are impossible to close;

- rapidly identifying roles or responsibilities that have been left unfilled, despites what was foreseen by the emergency plans prepared. It is imperative that problems and people not be left without answers or someone charged with handling them. And we must insist on the importance of identifying all the publics to be addressed and dealt with - especially as the typical error today would be to restrict this effort to the undifferentiated mass media public;
- working continuously to find the major initiatives the system should take. As we have seen, there is an underlying tendency to make due with reacting to difficulties, which lets crisis make its own laws. It is important to fight against the inertia of such a reaction, and to realize that the occasions when you can act effectively are few and far between. Your organization cannot let such fleeting opportunities slip by;
- constantly focusing people's attention on the long run and reminding them that a crisis always lasts longer than first expected. Such reminders should be repeated periodically, with insistence. Under the shock of the event, there is an overwhelming tendency to forget the time dimension;
- developing efforts to anticipate at every stage. Most actors tend to focus on the most recent difficulty (just at the time when it has already made its greatest impact and is no longer the essential problem). This is when people should raise their sites and ask of technical and organizational crisis management resources themselves what state the system will be in tomorrow, next week, or next month: in short, what next? In addition, thought should be given to ways in which the system itself may evolve (i.e. "what if) should the crisis continue to reign;
- highlight landmarks within the network involved in managing the problem to help understand what an emergency situation is and what its dynamics are. The same prejudices (e.g. people will panic, the risks must be hushed up, beware of the press) and the same behavior patterns (e.g. withdrawal, conflict, escape into fantasy) tend to invade events and determine reactions everywhere. If some degree of understanding of crisis problems exists at the highest levels, these classic tendencies can be put in context, and this will help to soothe the turmoil somewhat;
- also place crisis management within the larger picture of the system's ongoing life:
  - don't forget that the organization's life must continue outside the crisis-stricken area.
  - don't neglect to think about the return to normal (or at least to some form of balance, even if it is new): this means you cannot make short-term decisions that are untenable in the long term.

Various means have been developed to guide this multi-tiered action, notably the crisis unit. The idea is not simply to plug in a bunch of telephones, but to bring a previously tested organization into play. Three essential functions must be fulfilled:

- the post-accident situation must be continually re-evaluated. This is a role for technicians (who may even need to be organized in a complex network of crisis units, as we saw in the Mississauga case, where a number of specialized groups had to work together);
- expectations in the area of information, comments offered on the outside, rumors, and available means of distributing information should be re-evaluated continuously. This is the role of communications specialists;
- initiatives to be taken in managing the whole process, including decision-making and information, must be reviewed regularly. This is the role of top management.

As experience has shown, the ranks of decision-making units have a classic tendency to swell. But it is important not to confuse the work of technical investigation with that of determining strategy for the crisis. This was one of the lessons from Mississauga: when the crisis unit had grown by the early hours of the morning to include all the recent arrivals, it counted more than a hundred people. The operations managers divided this assembly into a decision-making group, including few members, and another, larger think tank of experts.

One need which is too often ignored is that of reassuring the officials in charge. It is exhausting to have to deal with demanding and critical problems over a long period, to feel the solitude of power, and to have to work often in the dark. It's one thing for a leader to declare, when things are calm, that he or she will be capable of handling any situation, since that is what the job requires; actually having to play this role of the keystone holding everything in place can be extremely destabilizing. To protect the solidity of these systems and the safety of those touched by them, it is absolutely necessary to offer specific training and tools to top-ranking decision-makers.

It should be clear that the importance of prior learning opportunities and rigorous controls to test both the strong and weak points in these systems cannot be underestimated.

## 5. Controls and learning opportunities

What makes the learning experience particularly difficult is that on the one hand, each actor's defense mechanisms - including negation, sublimation, or overly hasty rationalization - must be broken down, but at the same time, the actor must be supported, so that he or she can regain some freedom of movement.

This process can be undertaken step by step. Several basic questions must be asked over and over again:

- What is the organization afraid of in the area of major hazards and crises? What subjects seem taboo, or cannot be broached with the objectivity, resources, and determination that seem desirable?
- To what extent are the partners outside the organization informed, included, and implicated in thinking about and preparing these subjects?
- Are simulation drills performed, with the participation of top executives? With the participation of outside organizations?
- Has the organization already begun to make strategic decisions in order to reduce the risks in question and their potential effects? This point is capital: no one can control a crisis situation unless there have been prior attempts to come to grips with the issues involved.
- Do top management and the leadership of the agencies involved keep a close eye on all these questions, without hesitating to become directly involved?

This is where the practice of case analysis can prove highly fruitful: look closely, not only at technical aspects, but at social and human ones as well, of any serious accident occurring anywhere in the world, and try to understand what it teaches us. This is an activity for our times, and the classic model is given by what a group like Disaster Research Center in the United States has been doing for over thirty years.

Another useful exercise is simulation. Not only does it provide an opportunity to test the pertinence of mechanisms intended for use by the organizations and systems involved, but it also deliberately places the people involved in demanding situations. Developing individual psychology is actually an essential part of preparing to cope with such situations, in which individuals often find themselves standing alone on the front line. A simulation offers them at least a scale-model experience of what a crisis situation can be like, and participants will emerge from it:

- having felt the strong desire not to pass on information that appears tenuous for the moment - and will realize that this hesitation is actually a good indication that turbulence is approaching;
- having had the physical sensation of standing before a television camera and feeling naturally driven to reassure others in order to reassure themselves, with thoughts like, "What am I doing here? There must be a mistake, there's nothing wrong."
- having felt the opposite tendency as well, which they should also recognize as a defense mechanism;
- having felt what it's like to be left on their own in the midst of a highly disturbing situation, and having realized that this can have disastrous results for both the individual and the organization as a whole.

The point here is not to prescribe a set of rules, but rather to set up guidelines and landmarks. Beyond that, it is also possible to develop individuals' capacities for taking initiative, in the knowledge that these capacities are strengthened by making the organization a "safe" place for creativity and keeping it resolutely open to its environment.

Each of these points serves as part of a basis for developing overall action. By applying them, it should be possible to avoid difficulties that are only too common today - especially in the area of information. But there are other, much more pressing and more ambiguous questions that remain to be addressed.

# 6. Perspectives: the debate is open

We have just examined a series of resources and conditions that should be developed to avoid falling immediately and ineluctably into the grips of a crisis. On many points, however, we had to open parentheses that could not be closed. This should come as no surprise: the very nature of a crisis is that it cannot be grasped as a whole - otherwise it wouldn't be a crisis, but simply a small, localized disturbance easily nipped at the bud. Our remaining task, then, is to return to these questions that were left aside. As for any true problem, it is the answers given to the essential questions, or the lack thereof, that finally govern the ensemble, from the most general strategies to the most elementary tactics - and the more the crisis is acute, the more this holds true.

Our approach has followed three lines of investigation, and we shall return to them here.

The first line dealt with those in charge and the problem of navigating through the crisis: how can you set sights on a general direction when all around the foundations are crumbling?

The second line broadens to include the range of actors present and raises the problem of complexity: how much room for manœuvre is left in the general context in which a technological breakdown takes place today?

The third returns to questions that haunt many thinkers and have a heavy influence on behavior, even when the events in question are not out of scale: how far can destabilization go in a really serious case? What types of response would be possible? How could we meet the challenge?

## 1. The people in charge: how to manage in a great black void?

Guiding a system through what resembles a great black void is undoubtedly the primary and the most difficult task facing top levels of leadership. In any crisis, there comes a moment when the contradictions become overwhelming, when the information available is dramatically insufficient, and yet it is absolutely necessary to act and to make decisions. These periods of darkness

are characterized by radical uncertainty, colossally high stakes, the solitude of management teams, internal conflict that is even more destabilizing than external opposition, and a feeling of having lost all essential support at the most critical moments. The mere perspective of such an eventuality generates hesitation and slow-motion behavior. This key area, too rarely brought to light, clearly deserves to be studied. Too often we are satisfied simply to examine the black box at the end of the case: our task here is to see what happens inside it. This is why we insisted so heavily during the interviews on the question, "What was the most difficult moment, and how did you react?" The lessons drawn from these interviews and from looking at other testimony (1) (2) can be summarized in two points.

## *Holding the keys*

If administrative staffs and top managers want to avoid simply adding to the general disorder, they must quickly move beyond a short-term interpretation of events. They must gather together the keys that will give meaning to the action undertaken, and therefore a chance to make it efficient:

1. An understanding of the major fault lines that create openings for the crisis.
2. A view of the outcome or different possible outcomes to the crisis.
3. Logic structures to guide strategic action.
4. A clear perception of the responsibilities to be assumed for managing and driving forward the system as a whole.
5. A constant effort to think in terms of scenarios, and thereby to escape from the "obvious" conclusions of any given moment.

These points are widely illustrated in the interviews in the second part of this book. The main difficulty stems from the fact that everything converges to obliterate them: in a crisis, it is so much easier to lose oneself in action or other diversions. And yet...

- If the first key is missing, we will never get a handle on the crisis. If we reveal that we didn't understand what the real issue was, then we will only emphasize how nonsensical the situation is. We will undertake a multitude of badly-timed steps. We will attempt the labors of Hercules without achieving any tangible result.
- Without the second key, we find ourselves incapable of defining a general policy, which is the only way to give some coherency to the response as a whole. In a crisis, the smallest gap becomes a yawning gulf, and a lack of coherency is immediately transformed into burgeoning incoherence and dissipation of forces.
- The third key is necessary to avoid perpetual changes in the orders being given. While the other points may seem difficult to pin down, this one at least can be settled and used to define a line of action. It is very interesting here to look at the highly instructive experience of the chief of police in Paris during the protest movement of May 1968.

*Maurice Grimaud facing the storm in May 1968:*

"When I saw the way events were going and realized that, henceforth, anything could happen, I adopted a guideline for myself that was of great help to me in getting through the weeks that followed. I knew that we had to get out of this chaos without faltering. I hadn't wanted to become chief of police, but since I had the job, there was no way that I would abandon affairs of state to the street, i.e. to the mob. There, I stood on a firm and solid line that reassured me because it became so evident as soon as I had formulated it The other term of my problem was to avoid letting the disorder lead to an incident of bloodshed. It was reason as much as sentiment that dictated this language to me, because I knew that if one evening we had to comb the streets littered with burned-out cars and fallen trees to pick up the bodies of dozens of people killed in a Shootout, that could very well signal the beginning of an adventure whose outcome no one could predict I held the two ends of the chain firmly, and my behavior was fully inspired by this double conviction. Though it did not protect me fully from anxiety, it did give me a precious serenity in facing the minor twists and turns of this episode" (3 a).

- The fourth key serves as a reminder that a system needs to be directed. Henry Kissinger emphasizes this, saying, "The most important role of a leader is to take on his shoulder the burden of ambiguity inherent in difficult choices. That accomplished, his subordinates have criteria and can turn to implementation" (4).
- The final key is necessary to avoid forever aiming too late, too low, for too little.

But of course there is a great distance between identifying the keys we need and gathering them together. This means leaders are forced to undertake their operations in a state of resolute uncertainty.

## *Acquiring know-how*

As in all relatively uncharted areas of management, we could speak here of the "art" of managing crisis. The greatest difficulty lies in tracing a path that satisfies a range of conditions as varied as they are numerous. When we pass in review the points most frequently mentioned by decision-makers who have had to handle crises (1) (2), the resulting dashboard they depict is dense, to say the least. It is easy to imagine that the pilot at the commands would feel overloaded with so many dials, each demanding special attention.

### *Resist*

Don't lose your head when the crisis appears. Hold out physically, even though time accelerates, the rhythm of events picks up, and the trial drags on. Hold out psychologically, even though the tone of information seems as shifting as the winds and the situation seems to worsen endlessly. Remain cool-headed, even when a perfectly random straw arrives at the worst moment to break the back of your entire system of response. Learn to do a

moment to break the back of your entire system of response. Learn to do a hundred things at once, from defining major lines of strategy to "running the corner store", as one specialist put it. Managing a crisis does not mean taking spectacular measures: rather, it requires attending to an accumulation of critical details.

*Specify immediately the errors to be avoided and be constantly on the lookout for them*

Do not begin by analyzing and presenting the crisis as a short-term adventure. More generally, avoid the usual first step of applying the anti-manual discussed earlier, and identify all the cases elsewhere in which it is being scrupulously followed.

*Take action*

Know how to decide, but don't decide for decision's sake: what counts are the consequences of the action undertaken. Avoid hesitating at the moment when an action is in fact possible - this only gives new energy to the crisis. Know how to juggle simultaneously with unshakable firmness on one point, surprising flexibility on another, and a broad respect for your partners (even when they really seem to be adversaries). Know how to seize the rudder when it becomes necessary, without waiting for the lawyers to decide the move is defensible or for someone else to give impossible instructions (which in any case would only create further disarray). However, avoid letting this explosion of old roles go to your head. Don't jeopardize significant acts by petty maneuvering that could place definitive success at the mercy of some fleeting, marginal advantage.

Beware of the tendency to close off as many options as possible in order to avoid dealing with ambiguity. To the contrary, as Henry Kissinger writes in his memoirs, which offer prodigious food for thought about crisis management, "The edge of a precipice leaves scope for only one imperative: to obtain some maneuvering room" (4). Remain circumspect about adopting truly grave options. Don't try to pull off a high-impact operation when you are actually called on to operate in a very fragile environment. The attitude of a doctor discussing the treatment of shock victims provides an interesting metaphor: "Any victim of multiple traumas is fragile. Each lesion has an impact on the others. Only perfectly orchestrated intensive care can treat the maximum number of lesions in a minimum time" *(Le Figaro,* September 30 1971).

*Move forward through a highly complex field*

Work to strengthen the cohesiveness of groups and of systems. *Get* as much as possible from people and organizations without squeezing them dry. Help those most shaken by the course of events, and never let co-workers feel

abandoned to their solitude. Don't assume that the information you receive is true; instead, be aware that information generation processes must be handled prudently. Watch out for serious representational errors that can affect all your information sources. Know how to preserve an overview, while keeping an eye on critical details.

Be prepared to deal with the errors committed by your own team members. Count on the fact that your allies will make phenomenal blunders. Don't expect people to rally around the flag in times of trial; instead, watch for the prudent and discreet defection of those who understand only too well that a crisis can burn anyone who approaches it. Brace yourself for confusion created among the initiatives of various officials, and for a streak of internal dissension. Don't assume it will be easy to distinguish between friends and foes; individual motivations will tend to be unclear, and roles and alliances may even be reversed. Keep the channels open with political power holders, who may feel isolated if they are kept away from the scene; otherwise they may feel frustrated, and their uncontrollable desire to intervene may complicate the situation even further. Keep an ear open to rumor, handle information questions, remain prudent when faced with doomsday counselors, and avoid maneuvering in the shadows, which can be as tempting as trying to pull off a magic trick. Don't lose sight of the heart of the problem. Be ready to see new fronts open up and other crises surge forth at any moment - but know how to seize that moment when the crisis can be resolved, and not let a fleeting chance for success slip by.

Finally, remember that luck remains an essential part of history, and that it may shift completely, for no apparent reason. The dead end also lies within the realm of possibility.

This issue remains wide open. To help navigate in such total darkness, there are a few instruments available. But the exercise remains perilous. A leader's freedom of action is indeed limited. Chou En-Lai, writes Henry Kissinger, "was fond of quoting an old Chinese proverb: 'The helmsman must guide the boat by using the waves; otherwise it will be submerged by the waves'" (5). By shifting our examination now to the other actors in the crisis, we will attempt to gage just how tight this margin for manoeuvre can be, especially when those in charge must deal with major disturbances. In such cases, as we shall see, the essential keys we have identified can very easily slip out of our grasp.

## 2. The other actors: how much margin for manœuvre?

Most awe-inspiring in the management of a crisis is the general tendency for the event to trigger a snowball effect and to develop such autonomous force that intervention mechanisms can no longer establish a hold on the processes set in motion. The managers - those at the helm - may be the cause when

things skid out of control. But they are not alone. Many other actors are brought to bear upon the situation, each acting on his own behalf and on the ensemble, since in today's complex systems everything is interconnected.

There are so many parties involved that it will take multiple analyses to understand them. As Graham Allison demonstrated in his classic theoretical work (6), we must move beyond the conventional approach consisting in viewing each major organization as a bloc acting rationally according to the overall goals of its camp. Graham Allison introduced two complementary analytical methods: the first suggests that each party is actually a more or less tight-knit and conflict ridden alliance of various sub-organizations, each of which has its own goals and means of operating; the second sets aside the notion of organization and looks at the interplay of individual actors, considering them to be pivots that make the crisis evolve outside and around official dividing lines. These two approaches are worth developing in our research on crisis dynamics.

For the time being, we will limit ourselves to an examination of three major categories of actors - the purpose is not to make a global presentation of the subject, but rather to open several avenues of reflection.

## *The media*

These actors play a determining role in contemporary crises. Everything converges to bestow extraordinary powers on them: their functions, their social position, their background, their habits, their resources, and their place in the daily life of the average citizen.

- As an information supplier, the journalist occupies by definition a strategic position. Joseph Scanlon highlights this point when he writes, "An emergency, among other things, is an information crisis and must be treated as such;" (7) "To a considerable extent whoever controls the access to information, whoever is the source of information becomes the center of operations and control;" (8) "Communications are so important in the aftermath of disaster that the centers of communication may well be the centers of operational control as well" (9).

- As an observer and, at least in appearance, an impartial party, the journalist is in a social position which is itself an advantage: in an awkward situation, when everyone tends to withdraw support from "officials", the outside observer may well hold the strongest position of all.

- The journalist has a power over the emergency unlike that of any other actor: exceptional events are the stuff of his daily work. While others will need considerable time to shift their mind set in order to take into account something abnormal, the media can mobilize themselves almost effortlessly - in fact, abnormality is grist for their mill. Each parcel of information will be treated with the greatest attention (voraciously, some would say) by teams or individuals who know how to spot a piece of news or a photo that can travel around the world.

- Thanks to their increasingly powerful international networks, medias have power over time and space. This situation will undergo yet another revolution in coming years when new technical resources become available, such as direct satellite transmissions sent from a lightweight film camera, thereby making television as flexible as radio (and making officials more quickly and more deeply vulnerable, even below the top decision-making centers, in the intermediate hierarchy).
- Last of all, the journalist as news reader comes into our living rooms every day. As analysts noted during the gas explosion in Mexico City, this apparently intimate relationship gives journalists a degree of credibility that no official could ever hope to attain.

These advantages can render tremendous service in times of crisis, by giving information, advice, and instructions to the population; by explaining the phenomena at work; by reporting the thoughts of the various parties involved - in short, by making information work. But in a crisis situation, even more than in a calm one, the press (like all the other actors) can add its own problems to the turbulence. It is important to identify these problems, not in order to join the chorus of critics tirading against the press, but to develop a lucid view that will be useful to everyone, and to the press itself above all. Indeed, not doing so would be more dangerous, since it would leave the media open to "condemnation without trial" in a crisis situation, which is hardly a propitious moment for thoughtful reflection on the subject.

We will look here at a few points that deserve to be examined - but first it should be established that at least in theory, those in charge attempt, in times of trouble, to reduce confusion, to avoid polarization and abusive simplification, to lower the anxiety level, to show that the systems do indeed work, to begin the healing process, to stimulate coherency, to distinguish between what is essential and what is accessory, to separate current events from what is already past, and to shake off excess imagination, fantasy, and so on. By the way they operate, the media can create problems on all these fronts.

- The media system actually creates a formidable echo chamber on a national or even international level. It necessarily amplifies what it presents, when, at the same time, one of the very sources of crisis comes from the difficulty of finding self-correcting phenomena and bringing things back into balance.
- Certain inherent media traits can be seriously called into question when it becomes necessary to explain complex phenomena, which are inevitably part of any technological crisis. "Make it short and sweet", for one: what is the minimum time below which it is no longer possible to get a complicated message across? Similarly, the need to "make it simple" (spots and catch phrases are emblematic of the media world) is not adapted to handling subjects that can't be simplified. But since simplification is necessary, at what cost can it be accepted? The same goes for the constraints imposed by televising images: doesn't this provoke a distorted choice in the subjects handled? What will happen as readers and listeners become transformed into

spectators? Of course the medias can't be driven to change too quickly: they also have to satisfy the expectations of their audiences, who want to know everything, provided you keep it simple.

- In a crisis situation, communication responds to a logic that is hardly conducive to reducing the general excitation. A punchy message, for example, quickly saturates the public's capacity to receive anything else. And as different crises have shown, once information has been released, it becomes almost impossible to correct. In fact, corrections may only make things worse. What, then, are the consequences of errors which are difficult to avoid in a hard-to-grasp situation?

- In fact, error awaits the media at every turn of the road: officials have no comment, experts can't yet make an official pronouncement, and most journalists have only laymen's knowledge. But can they be expected to say nothing? The public expects news. In a media civilization, an absence of information signifies that the worst is at hand. Besides, even if one journalist remains silent, others will publish information (unless there is a news blackout, accepted by all the media, but this can only last a short time).

- The press also raises all sorts of other problems. By saturating citizens with information, it keeps their minds in a state of high tension. By a variety of details, it demonstrates that the systems are scarcely under control. It exacerbates opposition among individuals and agencies, since finding the contradiction is the key to any news investigation. Just when those in charge have done everything to show that there are well-organized systems that stand up under crisis, the press pours out lists of doubts, contradictions, frightening images, unacceptable proposals, and quotations that hardly flatter their authors. It reopens debates that had been painstakingly brought to resolution.

- The press may pour oil on the flames of the crisis, provoking explosive affects: in the Seveso drums case, for instance, several newspapers announced the drums were radioactive. The press stages images for their impact and knows how to use the full weight of words. In the same case, a leading large-format glossy magazine chose to frame its April 21, 1983 article in a hair-raising decor replete with images of the Second World War, Vietnam, Afghanistan, chemical warfare, pulsing anguish, rising fear, ghost cities, and so forth. More recently, when a large-scale evacuation of the population of an agglomeration was performed in western France following a fire in a chemical products warehouse on October 29, 1987, a paper in France's popular press featured a full-page banner headline the next day, stating "Scenes of looting in Nantes after exodus". On page two, an equally suggestive follow-up was, "After the looting, armed soldiers patrol streets." While calm reigned in the city of Nantes, a confused image was born in the minds of readers stopping over these headlines: was this Beirut? On television, the most effective language comes from theater, such as the image of the president of Greenpeace clapping handcuffs on the Italian senator Noè during the Seveso drums business (10).

- The press also thrusts "stars" onto center stage, who may whip up the media froth even further. Of course a star can offer useful support in

managing a crisis, by recalling key points, offering a comforting presence, and so on. But we should remain voluntarily critical of such a role and seek to understand its function: whether the star reassures or rages, doesn't the very presence of such a figure emphasize that the conventional regulatory systems have proven to be faulty? Doesn't it threaten to point us toward the dangerous solution of hunting for a knight in shining armor?

- Along the same lines, the press tends to glorify the poor little citizen and cut down the giant institution, along with organized groups in general. Crisis is an organizational affliction, and the medias highlight this disability - but this isn't necessarily the best treatment for it.

- Finally, it is worth looking again at the strategic position occupied by the press. What it chooses or doesn't choose to reveal is more than a simple issue of observing phenomena. It means that a false problem can acquire a national dimension, or on the contrary, a real event not picked up today by the media machine may not even be considered as a problem to be dealt with. This was the problem encountered in France following the hurricane that ravaged Britanny in October 1987: the disaster failed to hold the attention of the national media: "not enough dead", was the response given to those who tried to get reports aired. With no media coverage, the result was a "national deficit of emotion", according to a legislative representative from the area.

Such difficulties, which are largely inherent in the way any information is handled on a large-scale, should push communication professionals to think in depth about how they operate in a crisis situation. Such an analysis should turn its back on the habitual preconceptions and attacks proclaiming the media's irresponsibility and its taste for catastrophe. Once again, it is important to remember that the picture painted often contains infinitely less contrast than reality itself. While the excessive figure of 2000 immediate dead was announced at Chernobyl, on the other hand press reports from Mexico City in 1984 or from Bhopal lagged incredibly far behind the reality for some time - how could anyone imagine that there had been only a few dozen deaths in Mexico, when reports stated that thousands of cubic meters of gas had exploded and were burning in the midst of a densely populated neighborhood?

To repeat: too often, the view of the press and its work in times of crisis is so colored by wrath that no serious analysis is possible. The idea of dealing the death blow to this partner must be left behind for good. In the United States, the liberty of the press is protected by the first amendment, and this liberty is fundamental for democracy and freedom everywhere (in fact, some observers are worried by an erosion of the medias' powers, and they denounce the "war against the press" that they have seen waged in recent years (11)). On the other hand, the media mustn't consider that any examination whatsoever of their function is a crime of lese majesty. The press, like public authorities and industry leaders, is an actor in the system, and like them, would have everything to lose from holing up within its ramparts.

Such an examination should be carried out along the lines recently suggested by journalists Stephen Klaidman and Tom Beauchamp in their book *The Virtuous Journalist,* in which they trace the broad outlines for a debate intended to lead to strong and enlightened journalistic practice. They arrive at the need to open up the media to outside criticism, insisting also that "if the obligation of accountability is to have any meaning, journalists must agree on a framework for enforcing it." Otherwise, they fear that negative public opinion "could be translated into restrictive judicial decisions, antipress legislation, and other changes that could cripple the media (...) Producing a newspaper or the evening news on television is, in the words of one editor, a daily miracle. Being accountable for the mistakes that are made in the process ought to be a source of pride rather than a mark of shame" (12). We would suggest that new ways should be developed for reflecting not only on the ethical values of individual journalists or even the profession as a whole, but also, even more importantly, on the new situation created for technological crisis management by the emergence of a media society.

## *Scientists and experts*

In a technological crisis, scientists naturally play a key role. But here again, many questions remain unanswered. As the regional prefect placed in charge of the Rheims transformer fire case stated, "There were lots of meetings. We could never obtain definitive answers on the ultimate consequences of the event. The specialists remain unable to give an opinion for the long term or to determine thresholds. They replied, 'The figures we have could indicate that there's a danger, but not necessarily'" (13 a).

Any technological crisis situation is actually characterized by severe difficulties:

- Exceptional phenomena can be very hard to understand. This was the case for those attempting to follow a phenomenon like the one produced at Chernobyl: no one really knows what happens inside the core during fusion. The specialists can only offer theoretical knowledge, and then only if they are able to follow what is going on. At any given moment, and this is what counts for the decision-maker, the specialists are often unable to describe exactly what is happening, or what may happen.
- Any analyses that can be undertaken are time-consuming and offer uncertain results. When a scientist performs complex chemical analyses, for instance, error is lying in wait at each stage, from the moment samples of the substances to be analyzed are taken to the final interpretation of the results.
- Furthermore, the sense of urgency drives officials to put heavy pressure on analysts to speed up their work, at the risk of making significant mistakes. And as uncertainty grows, as the analyses become more delicate, as the stakes increase, the pressure applied increases in turn.
- The very issue of interpreting results raises serious questions. Once more, the Rheims case offers food for thought. Marie-France Gonnord, a

chemist involved in the analyses done for this case at one of France's leading research universities, states, "When we began these studies, we were probably focused on looking for extremes. Basically, our concern was, 'We'll look at the worst-case hypothesis.' Given the errors made because of that logic, there is a risk today of rushing to the other extreme, and starting with the hypothesis that we should ignore the aberrant information. That, too, could prove to be a dangerous approach" (13 b).

- Finally, when it's time to move from analysis to application, we run into other formidable unknowns. Dr Sylvain Dally, a toxicologist, summarizes the problem clearly: "There are a great many products for which we have theoretical data but very little clinical information. However, the day there is an incident, everyone turns to the clinician, because it is the health of human beings that is at issue. Then we find ourselves harshly confronted with the need to move from knowledge acquired with rats, mice, or even sometimes in vitro, to the human being. That isn't easy, because on the one hand, there is a lot to worry about; on the other hand, you can also say that the correlation between animals and man is not direct. In the end, we remain uncertain" (13 c).

But these are only the most fundamental difficulties. Scientific culture itself is characterized by two aspects that do not facilitate decision-making in crisis situations.

First of all, scientists and analysts tend to work in relative solitude, and different research units are isolated from one another. In contrast, the difficulties inherent in a crisis situation would seem to call for greater cross-checking of both the methods used and the results obtained. Those who have learned by experience about the risk of error and its consequences in crisis situations emphasize how necessary it is to break down the barriers in this field and to develop scientific research networks.

> *On breaking down barriers within scientific activity:*
> "A rapprochement needs to take place among specialists having different or complementary skills, whether in terms of type of equipment, capacity to offer a service, research capacity, or availability at a given moment It's important to compare our approaches, to share our know-how (despite certain reticence, though this is less characteristic in the United States, for example, than in France). We have to maintain our concern for research and our openness to what's happening abroad, because of the speed at which techniques, methods, and instruments are evolving. Because the analyses are so complex, there must also be constant cross-laboratory controls. To do so, it is imperative that we have the capacity to perform multipolar analyses and that we be able to check each other's results'" (Marie-France Gonnord, 13 d).

Secondly, there is a cultural gap separating scientists and decision-makers. The former often know very little about the world of immediate decision-making, with its high stakes and its intense media pressures.

This is where it becomes necessary to introduce and specify the notion of what an expert is (especially in the field of public health, which often lies at the heart of crisis decisions). As Lucien Abenhaim has pointed out, there is a

tendency to confuse technicians with experts. A technician may have tremendous difficulty coming to grips with the imperatives of crisis management. He may take refuge behind the issue of uncertainty, which is by definition part and parcel of a crisis situation. In contrast, the expert - and the public health expert in particular - is a specialist who takes a position despite the uncertainties, on problems that concern not just one individual, but entire populations. The expert does so, furthermore, with full awareness that this judgment will necessarily be subject to criticism. In a crisis situation, it is an expert that decision-makers need to have at their side (14).

Nevertheless, many difficult questions remain: what are the respective roles to be played by the technician and the expert? By the decision-maker and the expert? How can bodies of experts be created, especially when there is no legislative framework defining their purpose? It is important, too, for a decision-maker to locate the appropriate experts before a crisis hits. These experts should already learn to work together in peace-time, something they may not always have occasion to do.

### *The citizens*

Extensive research has been done on collective behavior in the aftermath of disasters, especially by Professor Enrico Quarantelli's Disaster Research Center. This work has contributed to dissipate certain widely-held beliefs indicating, for instance, that victims in a serious situation would be seized by hysterical panic or would promptly yield to the temptations of looting, violence, and so forth. More research should be done in the specific field of man-made catastrophes. We can note that the Mississauga accident did not give rise to any particular unsocial outbreaks - on the contrary, in this zone from which the 220,000 inhabitants had been evacuated, there had never been as uneventful a weekend in terms of burglaries. The issue was more uncertain during the gas explosions in Mexico, and in Bhopal as well. But the analysis of these events needs to be refined, and the elements of myth and grey areas need to be classified separately from what is more or less certain.

In this area, the interviews presented in Chapter 4 offer some promising leads. This analysis would be notably enriched by thinking about the role of the citizenry in contemporary society. The following points, though not exhaustive, seem particularly worthy of further thought:

- What factors favor or disfavor self-organization by victims?
- What are the processes causing officials, media, experts, and others to lose credibility and legitimacy?
- How does public opinion spread across different countries?
- What phenomena come into play when citizens see their leaders and their systems struggling to navigate in the dark over long periods?
- Is there a risk of wildcat reactions taking such forms as total defiance toward existing institutions, rapid cohesion of alternative groups founded on a refusal to negotiate with anyone considered responsible for the disaster,

refusal of complexity, danger, uncertainty, or power sharing in any form, or is there an opposite risk of general apathy which stifles both short-term protective reactions and the formulation of specific demands in the long term?

Intuition says that nothing can be considered obvious in this field. In order to remain prudent - and to nudge the powers that be into action - it seems wise to assume that a crisis situation could indeed sweep away what was wrongly assumed to be the invincible status quo. If any voice of prudence should be borne in mind, it would be that of Maurice Grimaud, who watched the implosion caused in France by the events of May 1968: "The French government looked like a puppet show. Official declarations no longer carried any weight. The surrealist protest slogans of May suddenly made them appear even more irrelevant than Latin" (3 b).

To instill some stability in this uncertain world that can be rather approximatively referred to as the public, resolute action must be taken to provide information and help people assume responsibility. For many years, the problem of the citizen's role has been ignored - the underlying conviction was that the less the public knew about existing problems, the less likely it was to create new ones. Recently, as we have seen, attempts have sprung up to increase so-called preventive information. This is intended to teach citizens what behavior they should adopt when confronted with a serious accident situation - most often it consists of staying indoors and waiting to follow the instructions to be transmitted by the public authorities over the radio. But these efforts should go much further.

The Mississauga accident was a case in point: the most problem-free shelters were those run by volunteer organizations, such as the Red Cross or the Salvation Army, that already were in regular contact with public powers and had developed solid working relationships based on their proven competence.

Clearly this is the only way out: with a well organized citizenry and a strong community life, the body social would not be left adrift, so to speak, when the authorities found themselves overwhelmed by the crisis and its difficulties; it would not become a fragmented, unstructured mass, without guidelines, ready to be led into any adventure that promised to run counter to the proposals made by authority figures (including the press and the experts).

A clear contradiction emerges here: on the one hand, risk, vulnerability, and crisis demand that society become more strongly organized and that new forms of solidarity develop. And yet everything seems to indicate that our societies are becoming especially impoverished in this area.

Solitude or solidarity? The first choice is garnering an ever-growing number of votes, thereby transforming our societies into scattered, rootless masses that are highly vulnerable whenever they are put to the test. This offers Crisis a fantastic environment in which to evolve. Should these tendencies persist, there may come a time when attempts made by a crisis unit at the height of the storm to regulate the situation will suddenly seem as tragic and ridiculous as someone trying to fight his way out of quicksand.

This should give public powers something to meditate on as they cling firmly to the idea that the public must above all refrain from taking action or assuming responsibilities, and should simply let itself be reassured.

## 3. What disturbances could a major crisis cause?

What makes crisis management so extraordinarily difficult, what creates such unease and makes the actors so much more maladroit than they might otherwise be - sometimes driving them to precipitate their own downfall - is the immense number of possibilities that open out across the horizon, all of which seem at first glance to offer frightening perspectives.

### *The danger of impotence*
### *Scenarios for extreme de stabilization*

The catastrophe (or trigger incident in a highly sensitive socio-organizational context) can provoke serious destabilization whose consequences cannot be foreseen. It is impossible to imagine the limits - especially in a world in which any adjustments made in highly complex phenomena are necessarily microscopic: by their contrast, abrupt openings (and indeed abysses) not only frighten, they also exercise a strange fascination.

Each actor can be seen making a contribution to the confusion.

#### *The citizen: fear and rejection*

The event could well generate an immense movement of rejection, and indeed rejection could become the rallying cry - meaning rejection of everything that contributed to produce the drama and give life to a vague, repressed anxiety that had been denied for decades.

This means casting away the object that caused the catastrophe and refusing the technology involved as well as the sector of activity. Refusing any high risk technology. Rejecting the whole, complex organization that gave birth to major technological hazards.

The obvious retort is that none of this is realistic. But its unreality isn't necessarily an obstacle; to the contrary, it provides a more attractive response to the unacceptable.

This rejection could spread to many areas. Rejecting experts, naturally - even an expert close to the victims, who would nevertheless try to speak the language of reason, that language perceived to be the source of so much harm. Rejecting the media for being torn between their desire to portray public emotion and their will to play a responsible role, since beyond a

certain point, they would no longer let the public voice speak. Similarly, a gap could open between citizens and officials, as the former realized that the latter were primarily concerned with protecting the socio-technical system, and that all their fine words in recent years about greater openness suddenly proved to be empty: openness was of course only suitable for situations of no significant impact.

This might lead, during a first phase, to the development of a generalized Brownian motion, with the random and ephemeral grouping together of unorganized forces whose primary concern is not losing their spontaneity.

All it takes then is disillusionment, blooming in the soil of fear, and the terrain is ready for an authoritarian episode. Maurice Grimaud expressed similar fears about the events in May 1968: "When the troops of protesters had tired and public opinion almost unanimously condemned its excesses and called for an end to the disorder, the road seemed open to an episode of strong-armed authoritarianism. Had the government bent under the blows then reigning down on it from all sides, had General de Gaulle remained isolated in the absence and silence that drove his followers crazy, we might have seen one of those saviors rise up who are never very far away in periods of disarray" (3 c).

*Industry leaders: against a backdrop of disenchantment, the temptation to use an iron hand*

Here again, the possible routes are numerous, contradictory and potentially converging, hi fact, all the themes and variations could be played simultaneously, at least for a while.

In a first phase, we might simply see competition emerging around the theme of risk: other industry members would step forward to confirm that they, unlike their colleague, had long since adopted more reliable techniques. This marketing type reaction would rapidly prove to be too narrow to offer anything more than additional complications. But there are many other scenarios to be considered.

Those in charge of production may wrap themselves in silence and try to disappear, making the assumption that in the end, it is up to the political powers to take initiative - they will simply follow instructions.

Then they, too, could fall victims to disenchantment, as one of the interviewees confided: an industry leader could get fed up with being held responsible, facing pointing fingers, and serving as the scapegoat of public opinion and the media. The time would come when he will wonder whether it's really worth developing new technologies that are so dangerous for the balance sheet, the brand's image, and the personnel's moral, also shaken by doubt. It was a strange experience to see top managers of insurance companies, participating in international seminars, reach conclusions very close to those of Green activists, even though each side arrived at its position by very different approaches. The insurers spoke of shrinking markets and

expanding risks to explain why they had decided to pull out of areas where the potential for crisis was too big.

As for manufacturers, they are still in a position to measure with horror the extent of destabilization, demand urgent law and order measures, and contribute in this way to an energetic use of the iron hand.

Another of our interviewees, in a scenario not involving a fascist option, did not exclude an accelerated restructuring of industrial groups worldwide, suggesting that a small number of large groups would control all the markets, including the media market. This would make it possible both to offer a large-scale retort if a crisis did occur and to have better control over the media and the social system. This option would not necessarily be perturbed by small, localized authoritarian adventures (since the real power would lie elsewhere).

*Political power: the risks of disappearing, resigning, and resorting to extremes*

Political officials may conclude that they don't have the means to restore the equilibrium of a situation so severely damaged by economic and technological powers. Let those who promote these high-risk technologies make their proposals - and let the politicians survive, i.e. not become cut off from their electorate. This could motivate the wait-and-see attitude observed during the first phase, which would leave the crisis all the time and space it needed to develop.

Other scenarios include symbolic reactions such as nationalizations or privatizations, or abandoning selected projects at opportune moments, under conditions dictated to the industry. In the latter case, the public powers would present arguments based on so-called common sense: "You've got to cut your losses;" "There must be something you can do without." Turning their attention toward public opinion, officials would be tempted to defend a curious position, showing that cuts had been made in all the most dangerous programs without, however, rest assured, having any real impact on the national standard of living. All that could be done then would be to pray that these exorcisms and magic tricks could miraculously restore calm.

Public power also runs the risk of suddenly losing touch with reality: rejected by its citizenry, scarcely respected by economic leaders, caught in a media quagmire, swept up in an international whirlwind that forces it to take grave measures, it could feel its foundations crumbling.

All these slip-ups would feed off one another and might, here again, lead the way to firm-handed solutions.

*The general backdrop*

Couldn't we find strength in social capacities that would provide a healthy context? As we've seen, destabilization is dependent on creating an imbalance between the event and its context. Once more, the question is worth looking

at more closely, and the backdrop is not so favorable. The philosopher Alain Finkielkraut emphasizes that we must assume henceforth that "reflection has been defeated": "We are living in an age of feelings: there is no longer any truth or falsehood" (15 a); the norm consists of "yielding with pleasure to the immediacy of one's elementary passions" (b). "His majesty the consumer" is king and no longer needs humanistic ideals: "The post-modern individual has forgotten that liberty is something other than the power to change channels, and culture itself more than just an impulse assuaged" (c). "Life with thought is slowly giving way to a terrible and ridiculous face-off between the fanatic and the zombie" (d). A "society of mildly retarded individuals", echoes television critic Philippe Boucher as he looks out over the audiovisual horizon (16). A major crisis set against such a backdrop would create a tidal wave of incommensurable force.

## *Alternative schemas*
## *The road not taken? Roads now closed forever?*

At the height of events, voices could be raised (probably not very many, but with the complicity of the silent majority) asking whether all these technological developments were really necessary.

These voices would attempt to revive the prophecies from the 1960s and 1970s, expressed by figures like Ivan Illich: "Almost overnight people will lose confidence not only in the major institutions but also in the miracle prescriptions of the would-be crisis managers. (...) People will suddenly find obvious what is now evident to only a few: that the organization of the entire economy toward the 'better' life has become the major enemy of the good life. Like other widely shared insights, this one will have the potential of turning public imagination inside out. Large institutions can quite suddenly lose their respectability, their legitimacy, and their reputation for serving the public good" (17 a).

Caught up in the movement, these voices would restate their old positions: "The foreseeable catastrophe will be a true crisis - that is, the occasion for a choice - only if at the moment it strikes the necessary social demands can be effectively expressed. They must be represented by people who can demonstrate that the breakdown of the current industrial illusion is for them a condition for choosing an effective and convivial mode of production" (b).

But Illich specifies, "At the moment of the crash which is industrial rather than simply financial, the transformation of catastrophe into crisis depends on the confidence an emerging group of clear-thinking people can inspire in their peers. They must then argue that the transition to a convivial society can be, and must be, the result of conscious use of disciplined procedure..." (c) "... the appeal of an individual to the formal structure embedded in a people's history remains the most powerful instrument to say the truth..." (d).

It is clear that such conditions do not exist now. No alternative path has really been prepared; the terrain has been left fallow. This perspective might

rise up in certain minds, but wouldn't it tend more to arouse nostalgia in a few than willpower among the majority?

The resolute adherents to this approach, if any remain, would doubtless be disappointed as they were forced to conclude that this militant language, by a strange turn of the wheel, also now appears "even more irrelevant than Latin", to use Maurice Grimaud's expression. Small may be beautiful, but in the end it leaves us indifferent. An apparently obvious answer to their position is that given the margins for manœuvre (at least in northern countries), it is no longer possible to conceive of an easy and spontaneous development of soft technology.

Illich's point of view might be raised, but more on a tone of regret than as an effective possibility based on a determined social will and, above all, on an already well-developed practice. It would simply become part of the general sound and fury, while emphasizing the absence of radical solutions, which would contribute above all else to despair or cynicism - unless, of course, the entire setting is altered: but then, nothing could be extrapolated from the situation as we know it today.

## *Leads to follow up*

Action must be taken on multiple levels. It should cover not only risk prevention and prior information, but also the capacity for immediate reaction and the learning of lessons from experience.

### *Before the event*

Nothing will grow spontaneously on the terrain of disaster. The aptitude to react in times of crisis is closely linked to the work that has been done before the upset. This goes for all the partners involved.

As far as citizens are concerned, the basic outlook today must count on their intelligence, their being informed, taking responsibility, and practicing solidarity. The only appropriate goal is to let citizens take charge more effectively of the problems facing the realm, especially on the issue of risk. Gustavo Esteva's testimony (see the interview in Chapter 4) and the occasional innovations made in the area of information are all signs of progress. But it is of primary importance not to leave these rare attempts hanging.

With regard to industry members, they must be encouraged to take a less defensive stance, in accordance with the inspiration behind the large symposium organized by the chemical industry in London one year after Bhopal (18). Questions about safety policy (including technical options, locations, personnel training, trade union and worker safety committee involvement, and information to the outside) must be kept open. Here again, the tendency to regress will be followed much more spontaneously unless work is undertaken today to study hazard-related strategic choices made by

companies, internal corporate culture, and their relations with all their outside partners. The distance and the lost time to be recovered are considerable. We mustn't wait for a crisis to push us into action.

To turn away from the path of hopeless abandonment, strong political backing is also needed: to make technical and social systems operate without oversimplifying them, to make them as rational as possible, to strengthen their coherency. This must be done using the tool of public speech without simply riding on the tails of public opinion or the media. It is best not to begin discovering such challenges under fire. Political leaders, like other partners, should start thinking about these issues today; an excellent first step would be agreeing, for example, to participate directly in simulation exercises.

The same effort should be made by the media, who have a difficult but important role to play not only in the post-accident situation but also in providing prior information.

The ground to be labored is extensive. One of the first steps is simply getting the different partners (industry leaders, administrators, press, elected officials, associations, experts) to work together. The goal is to break out of the logic dictated by ignorance or confrontation between two or more actors, working instead to develop better understanding. This will serve the interests of the community as a whole, but also of each actor involved.

### *During the crisis*

Action must be taken on multiple levels, from setting up high-performance systems (including centers for pre-crisis reflection and consulting groups to offer direct support in cases involving the formidable problems raised by totally unknown situations) to training individuals who will be saddled with the task of providing leadership in these major emergency situations (beginning with local government officials and industry leaders).

Making in-depth case studies, sharing experience from different sectors of activity and across international boundaries, and undertaking bold simulation exercises are all pertinent, but these efforts need to be developed.

Otherwise, even in the absence of a serious event, the very issue of major technological hazards and crises threatens to generate solid mistrust leading in turn to social demands which would be not only terribly costly, but also incoherent and misguided - and therefore unconstructive. And when disaster strikes, who could exclude that a serious lack of preparation, now more than ever, would trigger doubts that could snowball? Then, it would take more than verbal assurances about openness to save these ill-prepared systems.

Finally, even if we do not simply give up - the worst case is not inevitable - we cannot eliminate the eventuality that truly grave situations could bring about severe destabilization. To lay the foundations for positive action and to strengthen our willingness to take up this challenge, we should listen to the words of leaders out of history who had to confront crises, although not in the same field, and who knew how to galvanize people's energy, preserve

hope, and inspire respect by finding ways to bring their communities through the crisis. Listen to the voice of Maréchal Joffre, taking command under very dismal conditions and exciting the admiration of historians: "One of the surest signs of a great captain is that he never despairs at a situation and maintains intact his faith that he will succeed as long as he has not laid down his arms. (...) A battle lost is a battle you believe you have lost" (19).

Listen to Charles de Gaulle, who looks out at the void: "Among the French as in other nations, the immense combination of fear, self-interest, and despair provoked a universal abandon around France" (20). But to mobilize people's energy and determination, "At the sight of this distraught people (...) I felt myself carried by a boundless fury (...). Whatever I was able to do thereafter, I had resolved that day to do it" (20).

Listen to Winston Churchill, who did not brush off the prospect of failure: "...There were other tales of this kind. Athens had been conquered by Sparta. The Carthaginians made a forlorn resistance to Rome. Not seldom in the annals of the past - and how much more often in tragedies never recorded or long-forgotten - had brave, proud, easy-going states, and even entire races, been wiped out, so that only their name or even no mention of them remains." He nevertheless demonstrated his immense confidence: "It was nearly a thousand years since Britain had seen the fires of a foreign camp on English soil" (21). And he knew how to inspire the great push and fight despair. Speaking before Parliament, he praised the prowess of the RAF's young pilots: "May it also be that the cause of civilization itself will be defended by the skill and devotion of a few thousand airmen? There never had been, I suppose, in all the world, in all the history of war, such an opportunity for youth. (...) But these young men (...) of whom it may be said that 'When every morning brought a noble chance, And every chance brought out a noble knight,' deserve our gratitude, as do all the brave men who, in so many ways and on so many occasions, are ready, and continue ready, to give life and all for their native land" (21).

### *Learning, not forgetting*

Within our particular domain of work, without waiting for the situation to become pathetic, we can at least call for reflection and debate. Let those in authority, beginning with industrial and political leaders, begin to talk, and to talk together, about these strategic issues. Make a place for these questions on our national and international agenda. As Joffre said on the subject of war, crisis doesn't wait for last-minute virtue to appear.

Nonetheless, everyone is tempted to reassure themselves as we go from one alert to the next (we saw the officials busily recast reality after Chernobyl: no, they were never really caught off guard). Even reading these pages may inspire the same urge to forget about it all.

Forgetfulness is so tempting, no matter what the crisis: "In the heat of the action, my colleagues and I hadn't really feared that the protesters would take power. I was more troubled, once the danger was past, to remark what a

hurry the forces in power seemed to be in to erase even the memory of these events that had so frightened both governors and the governed during a long month. Shouldn't these forgetful men be reminded that not everyone has the opportunity to receive warnings from destiny?" (3 d). "And then, as May faded into the past, I watched uncomfortably as spite and arrogance settled over the debris left by fear. (...) I would have preferred a more modest triumph, an equally large crowd, but silent, meditating on this strange moment in which the destiny of France hung in the balance, as it has more than once in its history, between contradictory aspirations. Law and order would of course be restored, and that was good, but that mustn't muffle the voices that had called during thirty days for the birth of a more just, less oppressive world. The France of law and order shouldn't close its ears to the cries of its youth, otherwise everything will begin again one day..." (3 e).

Active lucidity is our finest weapon against crisis. It furnishes an indispensable basis to any work, and in this work today, all the partners must necessarily be implicated.

# Conclusion

With our little group of officials and determined actors, we have just made a first tour of the land of post-accident crises. Along the way, we have planted a number of landmarks, indicating dead ends, firm ground, danger zones, or leads to be followed. We won't go back over all the pages in this travelogue. It should be enough to remember how important it is today to open the black box in which the issue of post-accidental crisis has been locked up too long.

Nevertheless, the prospect is paralyzing. Like any borderline situation, the exceptional event, turbulence, and destabilization are frightening. Managers much prefer to put these awkward moments between parentheses and wait for things to return to normal before they begin once again to feel involved. As the strategy expert Lucien Poirier writes, "This repugnance for thinking and acting on unstable ground sheds light on the malaise politicians and strategy makers feel when confronted with a crisis phenomenon. How can they found a rational action on what seems to be a passing event, turbulence, or transformation, when they can seize neither its true motives nor the true actors, nor the enduring effects, beneath the Brownian agitation of appearances?" (1).

The temptation remains strong to go on ignoring the problem, or at most to perform some feat of magic when events are really too pressing. The trick may make use of the media: taking responsibility is forgotten in favor of gestures that burnish the image. It may involve decision-making: the criteria for choice then come to depend on visibility and demagoguery rather than on pertinence. There is also a great risk that we will put our future deep into hock, for instance by taking disproportionate measures as a reaction to some small incident (especially in the areas of evacuations or public health). This in turn is sure to provoke excesses in any ulterior, truly serious event. These dangers are present today, with the Chernobyl affair still alive in everyone's minds. The unwritten rule of the day seems to be, "Nothing would be worse than not doing too much", though this principle is untenable over the long term. In the same vein, openness has become a must term trotted out in any post-accident situation. It would be interesting to see over a longer period what these constant references to openness actually signify. Do they apply to

situations of exceptional gravity as well? Do they apply to the choices made in the area of accident prevention?

In short, we must be careful not to jump from one briar patch into another. This danger cannot be avoided without dedicated, in-depth effort, nor without greater maturity. This has been our focus throughout the present work, which is more concerned with fundamental reflection than with finding expeditive shortcuts, however attractive these may be. On the contrary, with the help of our interviewees, we have tried to introduce an element of rationality in this world of crisis which still seems to defy either understanding or coherent action.

We have called several prejudices into question, including the idea that accidents automatically provoke panic and irresponsibility, or that the best way to treat a breakdown is necessarily to stop all the activity of the system in question.

We have concluded that dealing with crisis requires setting up a complex, sensitive system, that operates continuously - before the event strikes.

We have seen that crisis management cannot be separated from risk prevention, and that it cannot be achieved without extensive prior training of all those potentially involved.

A number of tacks for managing an immediate crisis have been identified, and we have insisted on such necessities as building coherency, making systems operate as networks, anticipating the dynamics of destabilization, and cultivating the capacity to take initiative. These are all skills generally found lacking among individuals and organizations.

Clearly immense work remains to be done. There is of course the problem of public communication, so constantly badly handled until recently. But that is probably not the most delicate issue. What seems even more demanding is navigating through truly unknown situations, in which the margin for manœuvre seems reduced to nothing and all possible goals seem unattainable. Equally troubling is the lack of preparedness for crisis among citizens, experts, media, and leaders.

Major training efforts must be undertaken. The demand today for simulation seminars offers a clear and encouraging sign - provided this approach doesn't kill or pervert the thirst for knowledge with answers that tend to supply gadgets instead of leading to in-depth work.

But at this point in the discussion, we can legitimately ask whether before moving forward, we shouldn't broaden the scope of this work and consider the specificity of post-accident crisis. In the final analysis, aren't we asking the more general problem of how to guide our societies in a world increasingly shaken by brutal failures of its systems?

It is clear that technological breakdown is distinct from natural catastrophe in that it more naturally provokes attempts to find someone on whom to lay the blame (though if we look closely, issues like alarm systems, urban planning, and so on mean that natural catastrophes are also likely to arouse efforts to attribute responsibility). Technological breakdown is different from stock exchange or financial crises in that it immediately introduces a

public health dimension that creates a much greater dramatic potential. But the points in common are easy to see. Our framework of reference and our diagnoses could easily include episodes as diverse as violence among European soccer fans since 1985, the Eastern Airlines takeover battle and strike in 1989, or the stock market crash in October 1987. In each case, we have seen complexity render those involved impotent; responses run systematically one step behind events; the gap grows between available systems and the problems to be solved; the citizen fails to understand, and the specialist is at a loss.

And on the horizon hovers the military crisis, for which the darkness of the unknowns is so deep that our situation becomes pathetic. Even Henry Kissinger had to admit this weakness as he examined his impressions of a visit to a field of Minuteman missiles in North Dakota: "[West German Foreign Minister Hans-Dietrich] Genscher and I toured the facilities impressed by the professionalism and dedication of the personnel and by the technical marvel of both weapons and warning installations. But they did not relieve the unease at the fact that the survival of our civilization must be entrusted to a technology so out of scale with our experience and with our capacity to grasp its implications. (...) No previous generation of statesmen has had to conduct policy in so unknown an environment at the border line of Armageddon. Very few top leaders (...) have had as many hours to study the issues of nuclear strategy as the experts have had years" (2).

Mastering crisis phenomena in general is incontestably one of our stiffest challenges, and one for which we are little prepared. When we look over recent trials, it is easy to begin thinking that our systems have an annoying propensity to stumble systematically into the stupidest of errors as soon as trouble appears. Unless decisive progress is made, we may well struggle from crisis to crisis, from destabilization to ever deepening disintegration.

It is not at all clear that we can learn to move about easily in such a tormented environment. But at least we can accept the challenge, by setting out to conquer this new frontier with new tools, organizational forms that have been rethought, transformed corporate cultures, and a considerably strengthened sense of responsibility in each partner. The accounts we have collected here demonstrate that at the very least, the task is a fascinating one. Armed with a firm will - and a belief in individual and collective intelligence and creativity - we can obtain results that are not only useful but which give us inspiration as well. Beyond simple satisfaction, they will make us proud of standing up to the difficulty and grant us a sense of responsibility in dealing with major human issues. And finally, when we are tempted in the face of overwhelming obstacles to give up, we shall be sustained by a sense of dignity at having reaffirmed the freedom we seek so fiercely to defend.

# References

## Introduction


1. P. Lagadec, *Le Risque technologique majeur. Politique, risque et processus de développement,* Pergamon Press, Paris, Collection "Futuribles", 1981.
   * *Major Technological Hazard - an Assessment of Industrial Disasters,* Pergamon Press, Oxford, 1982.
2. P. Lagadec, *La Civilisation du risque. Catastrophes technologiques et responsabilité sociale,* Ed. du Seuil, Collection Science ouverte, Paris, 1981.
   * *La Civilizacion del riesgo. Catastrofes technologias y responsabilitad social,* Editorial Mapfre, Madrid, 1984.
   * *Dos Grosse Risiko. Technische Katastrophen und gesellschftliche Verantwortung,* GrenolO-20, Nôrdlingen, 1987.
3. P. Lagadec, *Défaillances technologiques et situations de crise. La catastrophe de San Juan Ixhuatepec, Mexico, 19 novembre 1984,* Laboratoire d'Econométrie de l'Ecole Polytechnique, 1985.
4. C. M. Pietersen,with the asssistance of S. C. Huerta, *Analysis of the LPG-disaster in Mexico city,* Dépannent of Industrial Safety TNO, The Netherlands, May 1985.
5. P. Shrivastava, *Bhopal, Anatomy of a Crisis,* Ballinger Publishing Company, Cambridge, 1987.
6. P. Lagadec, "L'industrie chimique après Bhopal : un symposium de deux jours, Londres 7-8 novembre 1985", *Préventique,* no. 10, September 1986, pp.10-16.
7. Report of the Presidential Commission on the Space Shuttle Challenger Accident, June 1986.
8. P. Lagadec, *Stratégies de communication en situation de crise. L'affaire des 41 fûts de Seveso: une gigantesque bataille médiatique (September 1982-August 1983),* Laboratoire d'Econométrie de l'Ecole Polytechnique - Ministère de l'Environnement (SEI), November 1985.
9. P. Lagadec, *Stratégies de communication en situation de crise : l'affaire de l'explosion du transformateur au pyralène de Reims, le 14 janvier 1985,* Laboratoire d'Econométrie de l'Ecole Polytechnique, September 1986 .
10. P. Lagadec, Ph. Dessaint: *La Communication en situation de crise : V affaire de l'explosion du transformateur au pyralêne de Reims, le 14 Janvier 1985.* Video film, January 1986.

* English-language version: *Communication in Crisis Situation : the askarel transformer explosion affair, Reims, 14 January 1985,* April 1986.
11. Interview with Jackson Browning, spokesman for the Union Carbide Group, during the London Conference (cf. 6 above).
12. P. Lagadec. "Stratégies de communication en situation de crise", *Annales des Mines,* October - November 1986, no. 10-11, pp.125-131.
13. Press release, *El Nacional.*
14. G. C. Meyers with J. Hlusha, *When it hits the Fan - Managing the nine crises of Business,* Houghton Mifflin Company, Boston, 1986 (p. 3).
15. P. Shrivastava: "Are we ready for another Three Mile Island, Bhopal. Tylenol?", *Industrial Crisis Quarterly,* Vol. 1, no. 1, Spring 1987, pp. 2-4 (p. 3).
16. G. Allison, *Essence of decision: explaining the cuban missile crisis,* Boston, Little Brown, 1971.
17. H. Kissinger, *White House Years,* Little Brown & Co., Boston, 1979 (p. 938).
18. R. Noto, P. Huguenard, A. Larcan : *Médecine de catastrophe,* Masson, Paris. 1987.
19. P. Lagadec, Ph. Dessaint : "La communication en situation post-accidentelle: le cas des incidents liés au pyralène", *Revue Générale de L'Electricité* (R.G.E.), no. 8, September 1987, pp.163-168.
20. Ph. Dessaint, P. Lagadec: *La Communication en situation de crise: l'affaire de Cusset-Villeurbanne, juin-juillet 1986,* (video cassette) Electricité de France, June 1987.
21. F. R. Kniffin, "Corporate crisis management", *Industrial Crisis Quarterly,* Vol. 1, no. 1, Spring 1987, pp. 19-23.
22. R. Thornburgh, *An Address to the First International Conference on Industrial Crisis Management,* New York University, September 5, 1986 (p. 18).

## Chapter 1

1. A. Ragenbass (nuclear and chemical industry consultant), personal communication to the author, October 1985.
2. J. Kemeny et al., *Report of the President's Commission on the Accident at Three Mile Island,* Pergamon Press, New York, 1979 (p. 104).
3. P. Sandman and M. Paden, "At Three Mile Island", *Columbia Journalism Review,* 1979, 18 (7-8), pp.43-58, quoted in J. Scanlon and S. Alldred: "Media Coverage of Disasters - The Same Old Story", *Emergency Planning Digest,* Emergency Canada, October-December 1982 (a: p. 48; b: p.52).
4. R. B. Irvine, *When you are the headline - Managing a major news story,* Dow Jones-Irwin, 1987 (a: p.vii; b: p.ix).
5. P. Lagadec, *De l'accident à la crise: l'affaire du Tanio, une marée noire de trop (mars-avril 1980),* Laboratoire d'Econométrie de l'Ecole Polytechnique - Groupe de Prospective des Ministères de l'Environnement et de l'Urbanisme, 1983.
6. *La lettre de l'Expansion,* no. 462, May 7,1979 (p. 4).
7. E. Morin , "Pour une crisologie", *Communications,* no. 25, pp.149-163, 1976 (p. 160).

**Chapter 2**

1. *Newsweek,* December 17, 1984 (p. 40, 44).
2. Préfectoral report, April 19, 1982 (p. 2).
3. J.-L. Nicolet, A. Carnino, J.-C. Wanner, *Catastrophes? Non Merci - La prévention des risques technologiques et humains,* Masson, Paris, 1989.
4. S. L. Fink, J. Bean and K. Taddeo, "Organizational Crisis and Change" *Journal of Applied Behavioral Science* (1971), quoted in G. C. Meyers with J. Hlusha, *When it hits the Fan - Managing the Nine Crises of Business,* Houghton Miffin Company, Boston, 1986.
5. E. L. Quarantelli, *Evacuation Behavior: Case Study of the Taft, Louisiana Chemical Tank Explosion Incident,* Final report for the Federal Emergency Management Agency, Disaster Research Center, Ohio State University, 1983.
6. H. Kissinger, *White House Years,* Little Brown & Co., Boston, 1979 (p. 13).
7. G. C. Meyers with J. Hlusha, *When it hits the Fan - Managing the nine crises of Business,* Houghton Miffin Company, Boston, 1986 (p. 19).
8. R. B. Irvine, *When You are the Headline - Managing a Major News Story,* Dow Jones-Irwin, 1987 (a: p. 13-14; b: p.viii).
9. R. L. Dilenschneider and D. J. Forrestal, *Public Relations Handbook,* The Dartnell Corporation, Chicago, 1987, Third Edition (p. 347).
10. *Rapport de la Commission d'enquête du Sénat,* presented by A. Colin, second extraordinary session 1977-1978, June 1978, no. 486 (p. 223).
11. *The New York Times,* January 28, 30, 31; February 3, 1985.
12. *Business Week,* December 1984.
13. Ph. H'Rouda, *Fuite de gaz dans une fabrique de pesticides en Inde : Bhopal, lundi 3 décembre 1984,* Observation Mission for Médecins Sans Frontières - Société française de médecine de catastrophe - Convergences médicales, Samu-94, Créteil, 1985.
14. P. Shrivastava, *Bhopal, Anatomy of a Crisis,* Ballinger Publishing Company, Cambridge, 1987.

Chapter 5

1. J. Delumeau, *La peur en occident - une cité assiégée.* Livre de Poche, Fayard, Paris, 1978 (p. 11-12).
2. Isère Département Pilote, *Rapport sur le Risque Technologique,* Sous-Groupe Installations fixes à haut degré de risque, Rapporteur: M. Mansot, DRIR Rhône-Alpes, 1986.
3. C. Farrugia, "Opération Isère département-pilote pour la prévention des risques majeurs", *Préventique,* no.14, May 1987, pp. 11-15 (p. 11).
4. P. Lagadec, *Dispositifs de gestion de crise,* Laboratoire d'Econométrie de l'Ecole Polytechnique - Service de l'Environnement Industriel du Ministère de l'Environnement (SEI), January 1983.
5. P. Lagadec, *Risques technologiques majeurs, gestion des situations de crise et vulnérabilité des grands systèmes urbains. Investigation sur le département du Val-de-*

*Marne,* Summary and Technical Répons, Laboratoire d'Econométrie de l'Ecole Polytechnique - Groupe de Prospective du Ministère de l'Environnement, January 1986.
6. M. Grimaud, *En mai, fais ce qu'il te plaît.* Stock, Paris, 1977 (p. 206-207).
7. C. Ferrugia and S. Beucler, "Choisir d'informer chez Rhône-Poulenc à Pont-de-Claix - un entretien avec André Henry", *Préventique,* no. 14, May 1987, pp.18-22 and 28-29.
8. F. R. Kniffin, "Corporate Crisis Management", *Industrial Crisis Quarterly,* Vol. 1, no. 1, Spring 1987, pp. 19-23.
9. Union Carbide, "UCE Area Policy and Procedure Manual - Major Accident and Serious Occurrence Notification", May 17, 1985.
10. D. Stephenson, "Are You Making the Best of Your Crises?", *Emergency Planning Digest,* Emergency Planning Canada, October-December, 1984, pp. 2-4 (p. 3).

Chapter 6

1. P. Lagadec, *L'action en situation de crise,* Laboratoire d'Econométrie de l'Ecole Polytechnique, Groupe de Prospective des ministères de l'Environnement et de l'Urbanisme, 1982.
2. P. Lagadec, *A travers les mémoires d'Henry Kissinger: Politique, stratégies, tactiques en situation de crise,* Laboratoire d'Econométrie de l'Ecole Polytechnique, Groupe de Prospective des ministères de l'Environnement et de l'Urbanisme, 1983.
3. M. Grimaud, *En mai, fais ce qu'il te plaît,* Stock, Paris, 1977 (a: p. 135-136; b: p.19; c: p. 330; d: p. 11; e: p. 322-323).
4. H. Kissinger, *Years of Upheaval,* Little Brown & Co., Boston, 1982 (p. 126).
5. H. Kissinger, *White House Years,* Little Brown & Co., Boston, 1979 (p. 781).
6. G. Allison, *Essence of Decision - Explaining the Cuban Missile Crisis,* Little, Brown & Co., Boston, 1971.
7. J. Scanlon, *The Miramichi Earthquakes: The Media Respond to an Invisible Emergency,* Emergency Communication Unit, ECRU field report 82/1, School of Journalism, Carleton University, Ottawa (p. 31).
8. J. Scanlon, *Crisis Communications: The Ever Present Gremlins,* Emergency Communication Unit, Reference to COMCON'82, Arnprior, Ontario, May 26, 1982 (p. 17).
9. J. Scanlon, "Crisis Communications in Canada", in B.D. Singes, ed. *Communications in Canadian Society,* Toronto, 1975 (p. 429).
10. P. Lagadec, *Stratégies de communication en situation de crise. L'affaire des 41 fûts de Seveso: une gigantesque bataille médiatique (septembre 1982-août 1983),* Laboratoire d'Econométrie de l'Ecole Polytechnique, Service de l'Environnement industriel du Ministère de l'Environnement et de l'Urbanisme, 1985.
11. P. Stoler, *The War against the Press - Politics, Pressure and Intimidation in the 80s,* Dodd, Mead & Co., New York, 1986.
12. S. Klaidman and T. L. Beauchamp, *The Virtuous Journalist,* Oxford University Press, New York - Oxford, 1987 (p. 229).
13. P. Lagadec, *Stratégies de communication en situation de crise - L'affaire de l'explosion du transformateur au pyralène de Reims, le 14 janvier 1985,* Laboratoire d'Econométrie de l'Ecole Polytechnique, 1986 (a: p. 163; b: p. 284; c: p. 288; d: p. 284).

14. Interview with Lucien Abenhaim.
15. A. Finkielkraut, *La Défaite de la pensée,* Paris, Gallimard, 1987 (a: p. 142; b: p. 143; c: p. 151; d: p. 165).
16. P. Boucher, "Chaînes" ("Journal d'un amateur"), *Le Monde,* September 12, 1987, p. 22.
17. I. Illich, *Tools for Conviviality,* World Perspectives, vol. 47, Harper & Row, New York, 1973 (a: p. 103: b: p. 106; c: p. 106; d: p. 110).
18. P. Lagadec, "L'industrie chimique après Bhopal: un symposium de deux jours à Londres, 7-8 novembre 1985", *Préventique,* no. 10, September 1986, pp. 10-16.
19. P. Varillon, *Joffre,* Paris, Fayard, 1981 (p. 221).
20. Ch. de Gaulle, *Mémoires de guerre,* vol. 1, pp. 73-74, J. Benoist-Méchin, *Soixante Jours qui ébranlèrent l'Occident,* 10 mai-10 juillet 1940, Paris, Laffont, 1981, p. 561.
21. W. Churchill, *The Second World War,* vol. II. *Their Finest Hour,* London, Cassell & Co. Ltd., 1951 (p. 227).

## *Conclusion*

1. L. Poirier, "Eléments pour une théorie de la crise", *Essai de stratégie théorique,* Les Cahiers de la Fondation pour les études de défense nationale, no. 22, Paris, Hôtel National des Invalides, 1983 (p. 370).
2. H. Kissinger, *Years of Upheaval,* Little Brown & Co., Boston, 1982 (p. 1195).