

## **ICE STORM IN QUEBEC**

### **5 January - 15 February 1998**

#### **Feed-back from experience**

*At the beginning of 1998, Quebec experienced an “extended and lasting” crisis. Our increasingly urbanised, technical and complex modern societies are built around continually interacting networks. An energy failure can very quickly reveal all the intrinsic vulnerability of such a system.*

*Patrick Lagadec explains here all the lessons to be drawn, for the future, from a phenomenon whose magnitude had been considered highly improbable.*

During the week of January 5 to 8 1998, Quebec experienced the most serious episode of ice-forming rain in all its history. The consequences were not only electrical power shortages, due to problems on the distribution networks, but also a power transmission network needing to be rebuilt on a very large scale; the beginning of a breakdown of whole sections of vital networks in Montreal and its surrounding region (electricity, transport, drinking water, petrol, radio-telephony, etc.); a massive scare for the decision-makers who could see the moment coming when Montreal would be paralysed – the evacuation of the city, a hypothesis that had been considered totally unrealistic by some, began to be envisaged.

Such a malfunction, in a developed country, was worth a feed-back from experience. All the more so – something to never be neglected from a methodological point of view – that the episode was remarkably steered by the key stakeholders, the first of which being Hydro-Quebec, and the tandem Prime Minister of Quebec/President of Hydro.

With a team from Electricité de France, lead by Jean-Pierre Bourdier, the Environmental Manager, we headed for Quebec and met not only with the chief artisans of the feat at Hydro-Quebec, but also with external analysts who have been at work since in various enquiry commissions.

## **1. An extremely serious situation, a remarkable control**

A number of fundamental difficulties rendered the situation extremely delicate:

### **1. A meteorological phenomenon of unprecedented proportions:**

- Duration: three successive waves of ice-falls spreading over five days (and not just a few hours).
- Extent: several hundred kilometres long (USA, Ontario, Quebec), several dozen kilometres wide, accompanied by “leopard skin” phenomena.

- Intensity: on the power lines, an ice thickness (up to 90 mm) twice as thick as the maximum reference standard (35 mm, knowing that Hydro-Quebec had adopted a more demanding standard of 45 mm, but still insufficient for the bad weather experienced in January 1998); in the city, even greater accumulations were observed, considerably hampering municipal services.
- Conjunction with the wind: wind gusts caused vertical oscillations of power lines whose mass had become enormous; in addition, the wind shaped the ice sleeves into a wing shape that merely increased the phenomenon: the structures were unable to resist.
- Moreover, prior to the phenomenon, there had been some snowfalls and the snow had not yet been cleared in the city; after the phenomenon, the temperature fell by 20°C, which did not make it any easier to intervene.

## **2. Unprecedented impact on the electricity network:**

For sure, in 1994, the network had experienced difficulties following some violent storms: 6,000 transformers had been destroyed. But in the present case, it was all the components of the network that were affected.

- With 26,000 broken posts, the distribution network was seriously affected.
- Even more paralyzing, and for the first time in its history, the power transmission network was very seriously hit: 3,000 km of VHV lines, 400 km of HV lines, 1,500 VHV pylons were destroyed or needing repair.
- Numerous installations were out of order: 4,500 transformers and 8,800 isolators needed to be replaced.
- Montreal's electric power supply depends on a certain number of vital transformation centres of which the majority were seriously affected.

## **3. Extremely serious general consequences:**

- 3,200,000 people were deprived of electricity, some of whom for over a month, in the heart of the Canadian winter; 27 people died (a relatively low figure if we consider the seriousness of the risks incurred both by the population and by those intervening, which included a good number of foreigners who were not used to the Quebec systems); the cost of repairs came to \$600 million (over \$200 million in lost revenues for Hydro-Quebec) and \$815 million for reinforcement work on the network, a figure to be compared with Hydro-Quebec's annual turnover of \$8 billion.
- In this overall picture, there was one critical spot: Montreal was for a large part deprived of electricity. Even more serious, on January 8<sup>th</sup> they came very close to losing the last power supply line still feeding the economic capital, as well as the loss of refineries and water supply; one cell-phone network was lost; the evacuation of the city was envisaged by some.

- To correctly understand the scope of the phenomenon and the magnitude of the task, it needs to be said that for certain pieces of equipment the whole of North America was put out of stock and of production capacity (for bolts, for example, in four weeks and over a limited territory, consumption was twice that of the quantity normally used in one year for the whole of Quebec).
- When, at last, the situation was ready to get back to normal as far as electricity was concerned, it was obvious that Montreal was not safe on other levels: road traffic, danger relating to the risk of fall of huge ice blocks, etc.
- However, the focus should not only be on Montreal: 700 other municipalities had been hit. In certain areas, the number of lines on or close to the ground and the fallen trees rendered movement very difficult when not downright dangerous. Quebec's Civil Protection Force was also confronted with an unprecedented problem: the organisational principles of emergency services simply did not envisage such wide-ranging phenomena.

Within five weeks (something which is a source of admiration for all knowledgeable specialists) the network had, on the whole, been put back into working order. The worst had been avoided in Montreal. Hydro-Quebec came out of the crisis with an exceptional image: competence and dedication (16 hour days were the norm for a long time) are the key characteristics of the way it handled this episode. Alongside the technical capacity there was a very strong and continuous presence in the field and in the media. The President was present on the worksites in the morning, meeting with his staff in the afternoon, then coordinating with the Prime Minister before holding a joint press conference right with him (the Prime Minister disposes of offices in Montreal that are in the same building as Hydro-Quebec) and all this every day.

Modesty, trust in the citizens, external as well as internal solidarity, strong cooperation with the Prime Minister, etc. all this contributed to the creation of a very real feeling of shared pride. Company pride, of course, but also undoubtedly even more national pride for having succeeded in overcoming with brio, and more successfully than its neighbours, such a serious situation.

## **2. Difficulties and strong points of the crisis management**

A spokesperson for Hydro-Quebec summarised the challenge for the company:

“We had an organisation designed to handle a breakdown. But we had to set up a system capable of rebuilding a whole network, and what's more, in an extreme emergency”. For a simple breakdown, it is chiefly a matter of triggering planned reflexes and organisational modes. A phenomenon as serious as this one, on the other hand, requires being able to perceive very quickly the completely exceptional nature of the situation, to think up novel organisational responses, to undertake actions in the field that draw their inspiration from unusual operating methods and to operate well beyond the limits of a purely technical response. The hierarchy of priorities needs to be reconsidered, the scope of action needs to be set in radically extended operational theatres, critical isolated difficulties need to be solved (for

example, making a last ditch effort to save a pylon whose loss would be fatal for Montreal's power supply), dealing often with weak external links.

What is most remarkable in Hydro-Quebec's handling of the crisis is without a doubt its ability to master all the aspects of the crisis, from the management of small equipment (the "small hardware", which turned out to be a critical point) right up to the establishment of shared priorities with the politicians, not forgetting a high quality media presence and strong networking with all partners. All this required technical and political abilities, but also and maybe above all, an ability to build up ad hoc organisational responses throughout the episode that were at once new and yet capable of fitting into the general framework and the corporate culture of Hydro-Quebec.

The following are some of these difficulties and the responses that are particularly worthy of attention.

### **1. A relatively gradual weather phenomenon, an extremely fast warning system:**

- Often, exceptional episodes which do not appear in flash mode are only perceived as major events with a delay that can be quite penalising; this is due to a variety of associated reasons: unsuitable analytical grids, moments of respite that tend to give undue reassurance, a need for reassurance, operations that if triggered imply strong and absolutely clear signals, etc.
- The events of January 1998 started on Monday 5<sup>th</sup> with a first wave which was in no way exceptional; in fact, a certain respite was noted right after this first wave.
- Nevertheless, Hydro-Quebec's management very quickly moved into reinforced watch and alert mode, based on a perception that was as yet unsupported by any sure "evidence"; one key manager, who was just beginning a week's vacation, "felt" already on the morning of the 6<sup>th</sup> that the situation was potentially very serious and got back to Montreal (it should be noted, for research purposes, that this virtuoso of weak signals was incapable of explaining to us why he had "felt" that he should immediately get back to his office).

### **2. A very difficult initial diagnosis, a strategy for fostering safety in all circumstances:**

- The basis for emergency action is the initial diagnosis. In a crisis, it is often difficult to make avail of a diagnosis, something particularly disturbing for the operators. The challenge in such cases is to be able nevertheless to lay down some effective actions.
- Hydro-Quebec was faced with this problem during the first week in January; very unfavourable weather conditions prevented any reconnaissance by helicopter (they were unusable prior to Sunday 10<sup>th</sup> and Monday 11<sup>th</sup>); a large number of lines on or close to the ground and numerous trees strewn across roads, considerably hampered access to the sites; the constant deterioration of the weather and its increasing effects on the network made any data collected almost immediately obsolescent.

- The technical staff reacted very intelligently by undertaking preparatory actions which would have been in any case indispensable: clearing the work sites, making roads safe.

### **3. An ability to break away from the logic of “contingency planning” in order to think in terms of comprehensive action:**

- The normal logic behind emergency rescue actions strongly encourages the technical operators responsible for a distribution network to do everything they can to quickly put their network back into operation.
- In January 1998 in Quebec, the technicians realised very quickly that the problem was much more serious than usual, the power transmission network had been hit, requiring a complete revision of the logic behind the usual approach.
- A whole new approach was taken, starting with the question: “What is the worst that can happen to us?”
  - Ad hoc strategic priorities were formulated. The following logic was followed through: in each area to be treated, aim to re-supply 50% of the network (in this way the territory concerned would at least be able to survive, the 50% meaning that evacuation could be avoided) and give priority to the city centre of Montreal; next, recover the remaining 50%; get things back to normal for the winter 1998/99; make sure that the network is durably reinforced.
  - More precisely, there was a clarification of the criteria for making decisions: distribution was not restored if the main transmission network was not in working order; it was restored first where it was more essential for the population (and for this, the fact that the “customer” and “network” files were interconnected constituted a remarkable advantage).
  - It was necessary to very quickly come up with a response that went beyond standard practice, habits and taboos. For example it was not usual, nor very well tolerated in-house, to call on foreign resources (manpower and equipment) (“We had 1,500 people available, we needed 4,000”). This need had to be considered from the very earliest stages, people needed to be convinced.

### **4. Faced with a non-standard phenomenon, think different in terms of organisation:**

- The organisation was designed to handle localised episodes, based on the principle of mobilising geographical organisations according to incremental levels (local, regional, provincial). Very quickly it was recognised that task forces needed to be given a much greater latitude of freedom.
- Thus was born the concept of “missions”: a task force, having wide-ranging autonomy for action in a given area (the missions covered technical competencies but also included supply and communication capabilities). These missions (of which there were about thirty, each comprising some 150 people) were the task forces of the contingency organisation.

- The whole organisation was steered by a central staff team, reporting to the President. Everything that effectively required strategic decisions was kept centralised. For example, concerning purchases, responsibility remained with headquarters for all purchases over \$100,000, everything that was critical for getting the network up and running again; everything that required absolute quality control.
- Centralisation also has imperative operational reasons in an episode as wide-ranging as this one. Thus, for example, it was realised that the equipment needs for distribution, on the one hand, and power transmission on other hand were in fact weighing down on the same factories, the same machines; the procurement policy therefore needed to be the subject of coordinated action, a need that had never been felt up until this time.

## **5. Faced with an extreme phenomenon, reconsider priorities concerning resupply**

- The list of priority customers is standard : in class 1, hospitals, fire services, ambulances, etc.
- In a case like this one, where the totality of resources is concerned, and where the restoration of the network depends on the ability of the suppliers to meet the needs in terms of manufacturing and transporting the spare parts needed for reconstruction, it is essential that level 1 priority be given to the suppliers, or more exactly, to the critical activities of key suppliers. This is what was done, with changes being made as time went by as soon as this or that material was no longer (or indeed became) critically useful.
- Generally speaking, a major difficulty was that of constantly ensuring full mastery of priorities. Thus it was discovered that it is by no means easy to act on the basis of 33 first rank priorities...

## **6. Ad hoc capacities, to provide for a gigantic supply and intervention operation:**

- The needs were impressive; supplies needed to be reconsidered on a Canada-wide scale (as far as Vancouver) and even North America (very soon, there were no more emergency power units available from Miami to San Diego). Sometimes it was even necessary to go much further afield, establishing contact with the US State Department to obtain Russian Antonov planes, the only ones with a size capable of carrying large pylons (in fact this resource was eventually not used).
- New rules were instituted, such as the possibility of using airplanes to bring pylons from British Columbia, so as to avoid any stock shortage while waiting for the material arriving by land.
- A free-phone number was set up to receive offers of service from the US (it should be noted that the quality with which such offers are processed can be critical: a supplier who is turned away could very well complain to the President or to the media, even if his offer is totally unrealistic).

- The army was called on for essential tasks that do not require specialist knowledge (recovery of parts and materials from lines that have fallen to the ground, opening up access to sites). American specialists called in as reinforcements were integrated in the Hydro-Quebec teams in order to avoid the risk of accidents (in fact there was one, due precisely to differences in work standards between the two countries).
- All of this needed the constitution of specialised cells to think through the problems, forge solutions and adjust practical implementations.
- One key lesson was drawn from this experience: the need to prepare, outside of the pressure of emergency situations, framework agreements with the inner circle of the main suppliers; to formalise relations with the second circle that can supplement the first one if ever it was unable to meet the needs.

### **7. In an emergency, forge and implement new technical rules:**

- An emergency situation demands temporary but effective solutions, requires leaving aside normal methods and going for “intelligent DIY”. Engineers need to think up new, perhaps less sophisticated practices that can compensate for a deficit of this or that equipment. Lists need to be drawn up of non standard products which can nevertheless be considered equivalent (this is something which initially probably needs doing “under fire”, with lessons then drawn for the future: establishing lists of equivalent parts and materials that can facilitate repair work under similar conditions).
- It then remained necessary to convince the users of the legitimacy of such deviations from standard practice (the instinctive reaction of those involved is to consider that they are being asked to “work badly”). This also means not forgetting to warn the users that they would be receiving non standard but equivalent material. If this information is not passed on, then very soon the teams will be sitting on stockpiles of parts which have not been recognised as usable, even as they complain of a dramatic lack of material and equipment.
- Cannibalisation, from posts and lines fallen to the ground, was developed on a large scale. Sometimes, this cannibalisation lead to a return of the parts to the supplier for repairs or recalibration.
- New practices also needed to be found for quality control with the suppliers, such as “macro” control, that is not usual but nevertheless adapted to the situation.
- The same flexibility is necessary for transporting the parts to the sites, something which is also very delicate: unfavourable weather conditions, congested roads, lack of fuel. Here again it proved necessary to review priorities based on the situation. The quality of the communication between the players (strategic teams, trucks, delivery sites) once more was seen as essential (hence also the interest in fitting vehicles with radio and GPS transmission systems).

### **8. Strong internal mobilisation, maintained and controlled over a long period:**

- The teams ended up working without interruption for five weeks, often for 16-hour days, in conditions of intense cold.
- Priority was given to safety, though in aftermath it was considered that this point could have been further reinforced.
- Likewise, care was taken to detect any cases of extreme fatigue and oblige the operators to take a minimum amount of rest (at one moment it was requested that the daily work hours be reduced from 16 to 12). As for the management teams, care was given to ensure that key persons in charge had a back-up so as to allow the necessary rest periods.
- For all the personnel, so totally dedicated to the task, Hydro-Quebec even went as far as putting in place accommodation facilities, canteens and child-care facilities.
- Hydro-Quebec was also able to mobilise retired staff or persons who had recently left the company (a strong sense of civic duty may be noted here: recently laid-off employees came back to give a hand...).
- Generally speaking, care was given to take advantage of any expression of goodwill: in such circumstances, willing hands are always ready to volunteer and care was taken here again to make sure that this should not be neglected (organisation of a freephone number for people offering their services). Once again we see the same North American philosophy that has been observed in other episodes, such as the great evacuation of the Toronto suburbs in 1979: build on the willingness of volunteers, rather than immediately impose plans that are inspired by a more or less “military” approach.

## **9. A high-quality media presence:**

- The reception lobby of the Hydro-Quebec building was transformed into a gigantic studio; journalists regularly received up-dates on the situation. Certain rules were clearly laid down: for example, no interview was to be granted for an in-depth analysis of the event, attention was exclusively concentrated on facts; however, technical briefing sessions were organised from time to time for journalists seeking more specialised information. Except for such sessions, specialists were not disturbed from their task.
- In order to guarantee the best possible feed-back of information that could be of interest to the media, staff from the communication department were dispatched to each emergency centre in the areas where television was not working.
- Care was taken to appoint just one person (obviously with a back-up) to be the regular correspondent of a given media; in this way, yet again, care was given to building up a consistent, durable and loyalty-fostering relationship with the listener/viewer.
- Each day, the President gave a press conference, together with the Prime Minister. The aim was to give a status report and to indicate specific objectives for restoring the situation (the option here was to build on positive aspects and avoid adding to the worry of the population, i.e. state repair objectives that would certainly be met, maintain a “safety” margin that would

avoid any bad news and, better still, draw a positive advantage whenever the objectives were exceeded).

- A key point was the general tone of what was said. The “control and command” logic that is usually so prevalent in disaster situations was left aside, the aim being rather to develop a logic of trust and collaboration with the citizens and their elected representatives. For example, even though emergency accommodation centres were being set up, each family that had electricity was encouraged to take in the other members of the family who were without it (“If you have relations living in areas where there is no electricity, invite them to come and stay with you; if necessary, gently insist for them to come to you,” added the Prime Minister on television. This is a far cry from the classic: “Do not undertake anything, do not move, wait for the army transport vehicles to come” !).

#### **10. A strong presence among the population and their representatives:**

- One trap was immediately identified: media interventions have as their primary audience population groups who are not directly affected by the events. It was therefore necessary to undertake specific initiatives in this regard.
- The presence in the field, alongside the population, was a priority expressed through organisational teams working not at the corporate centre but at Hydro-Quebec’s local offices in the heart of the most hard-hit areas.
- Each “mission” included a person responsible for relations with the public and their representatives, particularly the mayors. This freed up the technical staff and also structured and reinforced the links with the public, right at grass-roots levels.
- More generally, telephone conferences were organised with specific target audiences such as mayors, members of parliament, etc.
- As a symbolic gesture, the public lighting of the Hydro-Quebec tower building was shut down at night.

#### **11. A strong involvement of the President:**

- The President of Hydro-Quebec came on the public scene on the fourth day, accompanied by the Prime Minister.
- Right from his first televised appearance, he found himself being asked questions about the discussions that might need to take place concerning the safety standards applied to the network, and he accepted the opening of a critical examination of this issue. “Yes, there will be numerous symposia to examine this point,” even as he underlined the immediate priority of dealing with the present situation.
- Throughout the episode he was clearly in control: defining the fundamental priorities, the major operational objectives of the day, the handling of symbolic management, the problem of internal cohesion, the essential acts of external communication.

- The President's daily press conference was a major event: joint intervention with the Prime Minister, language totally free of technical jargon, clearly defined objectives for the following day (importance of a step-by-step approach and calling the citizens to witness), carefully studied dress code (polo-necked shirt indicating that the President was just back from the field, that he was close to the population and to his hard-working teams), the whole approach being articulated around the notions of trust, solidarity and pride. The President even reversed the classic approach of "This is what we are going to do for you" by introducing the question "How can you help Hydro-Quebec?".
- At the conclusion of the crisis, he made sure that the restoration process was properly wrapped up, in particular by bringing the concluding remarks to a film destined for the employees and covering the event and its treatment by Hydro-Quebec. Once again, technical jargon was avoided, concentrating rather on felt perception and concluding with the legitimate pride of each employee for having contributed to a response that was both praise-worthy and of capital importance for the country ("Something unusual has happened... I can feel it, you can feel it... Hydro-Quebec's employees have rediscovered their pride...").

## **12. Aftermath phenomena:**

- The dynamics of the conclusion of a crisis are very sensitive: generally speaking, little is done to prepare for it; the organisation is exhausted and it is not easy to settle into a long-term mind-set for outsized phenomena. For certain issues the crisis may continue... even as the dedicated crisis contingency teams are no longer available with their non-standard resources.
- This is one aspect where Hydro-Quebec experienced some difficulties after the month of February (notably in the area of billing).

## **3. Critical questions, which need thinking about**

Three difficulties were a cause of problems during or immediately after this episode.

### **1. External links were sometimes insufficiently prepared**

- In such a complex and potentially destabilising episode, any pre-existing weakness could potentially become a fatal flaw.
- In this disaster, the following are some of the problems which were the cause of difficulties: State structures that were less reactive than those of the company (thus, for example, Hydro-Quebec was eventually asked to provide farmers with small autonomous power generators, something which was most certainly not the responsibility of the company; though the Executive's wish was indeed fulfilled); local authorities that were sometimes poorly prepared; an Urban District Council for Montreal where the Police Department sought to impose its law and its standards (the quite classic "command and control" approach) on a Civil Security organisation that was more in tune with the modern requirements for managing a public crisis (in fact very much in line with Hydro-Quebec's own principles); certain facilities such as

water treatment plants that were lacking any appropriate emergency power supply generator systems.

- One idea seemed to make its way thanks to this trial: the need to ask each key citizen or organisation to have a contingency plan for covering three days of autonomous power supply; this would make it possible to considerably reduce the number of “absolute emergencies” and would give a much greater margin of manoeuvre to the company responsible for the general electricity power supply (this principle would in fact be well worth examining for other vital network vulnerabilities).

## **2. Critical issues regarding public communication:**

- The principle of transparency has become the norm when it comes to public communication.
- In this episode, one critical question came to the fore: a certain risky technical operation needed to be undertaken on a Friday afternoon. If it failed, Montreal ran the risk of losing its water supply. Existing stocks provided for 4 more hours of consumption. In case of failure of this technical operation, it was going to be necessary to envisage evacuating Montreal with all the difficulties (some experts even saying “impossibilities”) that such an operation entails.
- Was it necessary, was it possible to communicate this information? The position retained was that of non-communication, based on the following considerations: “If we communicate widely on this critical uncertainty, everyone is going to want to start stocking up on water and within an hour we will be out of stock, thus merely precipitating the dreaded event.”
- Some journalists got wind of the problem and called; the information filtered out but was not widely disseminated. On this occasion, as in several others (touching particularly on the critical vulnerabilities of the network), an appeal was made to the journalists’ sense of responsibility, and no one complained about the overall handling of the problem by the press.
- It would be well worth studying this point in greater depth, and all the issues it raises. This should be done avoiding any preconceived ideas but being fully aware that this type of question only applies to institutions whose communication performance is already very effective and open; the others would be heading for a fiasco before ever reaching these highly unstable and unpredictable crest lines.

## **3. Final discussions on the major decisions to reinforce the network:**

- It is around this point that a controversy developed a controversy the traces of which can be found in the media and in semi-official circles.
- For Hydro-Quebec, it is absolutely essential to reinforce the network in order avoid running the risk of a similarly dramatic episode in the coming years, including the next winter season. This requires substantial reinforcement (new power lines, in particular). It is clear that this objective, which requires an immediate technical commitment (structural reinforcements cannot be obtained in a few weeks, they need to be launched immediately to ensure secure

conditions for the winter season 1998/1999), will not be able to be reached if the usual procedures are to be followed regarding social discussions (consultations on impact studies) which are the norm for major projects of this kind. Consequently it was judged essential – and was granted by the authorities – that these consultation procedures be reduced. Consultations will still exist, but only the stakeholders directly involved will be allowed to have a say. The key determining factor in the reconstruction process is the urgency of the situation.

- For those opposing such a position (see the editorial by Alain Dubuc in *La Presse*, Montreal, Wednesday 18 February 1998), Hydro-Quebec is taking undue advantage of the crisis to force the passage of its projects (which were indeed already in the pipeline). According to them, an in-depth debate needs to take place on the subject of energy consumption, dependency on electricity, production modes (small power stations), transmission lines, prevention, etc.

- After a first analysis, Hydro-Quebec appears to be faced with two fundamental options:

- The first is to consider that it is indeed up to the company to ensure the energy security of the country and that any delay to such a programme would most likely open it up to violent criticism were a similar episode to repeat itself; this would argue in favour of firm action to be undertaken with no delay, in line with the technical options currently retained. In this line of thought, the operator can consider that those who today accuse it of being “a State within the State”, of taking advantage of a “blank cheque” given by the politicians, would not weigh very much in the debate that would surely follow an even more serious blackout, with possibly incalculable human consequences.

- The second is to consider, on the contrary, that the days are over when it was up to the operator to determine the energy priorities of the country. It is up to the country itself to determine those objectives and the company needs to state very clearly that it is not responsible for imposing the necessary choices. One could then consider that by refusing to exit the crisis in a brutal cavalier fashion the company would not run the risk of seeing public opinion turn against it. When you have been applauded as a hero, it is certainly dangerous to be perceived after all as “profiteer”.

- The particular interest of this last point lies in the fact that all major operators, in whatever sector, are faced today with this issue of how to position themselves, on a wide variety of subjects (including GMO’s). It would be particularly useful to delve into these questions in a cool, calm and collected way, quite outside of any immediate crisis, and to experiment with some innovative practices in the social debate on this type of issue.

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