"DEVELOPMENT OF SAFETY MANAGEMENT PROCESSES: FEEDBACK, ANALYSIS OF HUMAN AND ORGANISATIONAL FACTORS, AND CREATION OF A SIMULATOR TO ENHANCE COLLECTIVE COMPETENCES IN OPERATIONAL ACTIVITIES"

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1. GrDF Background

GrDF is the subsidiary of the GDF SUEZ Group in charge of managing the natural gas distribution network in France. To this end it constructs, maintains and operates more than 193,000 km of pipes serving 9,340 municipalities and 11 million customers, with a constant concern for reliability and safety.

To cover the industrial risk[1], GrDF has introduced an Industrial Safety policy aimed at:

- ensuring the safety of people and property,
- guaranteeing the quality and continuity of gas energy supplies,
- preserving the environment.

The industrial risk is inherent to the main activity of the Distributor: "To supply gas from the Transport point of delivery to the point of delivery of the end consumer on behalf of a supplier". The industrial tool to provide this service consists of a series of underground pipelines, fittings (taps, reducing valves, etc.) and pipes in buildings designated by "distribution network". Various wide-ranging technical actions have been undertaken to reduce as much as possible the overall level of industrial risk in the network, in particular:

- installation on the network of preventive or indeed corrective safety devices,
- removal of high-risk assets,
- reinforcement of maintenance.

Faced with heightened public expectations in relation to safety, and the increasing media coverage and "prosecution" of accidents[2], in 2008 the Industrial Safety policy took on special importance for GrDF.

However, if the technical aspects of risk management are now effectively controlled, the same cannot be said of the actions of operators in situ, in other words: the human factor. This, in the sense of "behavior and mentality" but also "competence and professionalism", is a lever for action that is used today in the Industrial Safety Policy of the Distributor.

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[1] *The industrial risk is the possibility of an event occurring on an industrial "site", with immediate consequences for personnel, the local population, property or the environment.*

[2] *An accident is an event such as explosion, a fire or an emission resulting from uncontrolled releases that occur while distribution facilities are being operated and create an immediate or delayed serious danger.*

2. Industrial safety: issues and objectives

Industrial safety is a fundamental aspect of GrDF's job of distributor, with a strong commitment not to have any casualties following an incident or accident in the vicinity of the distribution networks it operates, whether it be third parties, its employees or employees of its contracting companies.

In 2008, GrDF launched a project to energize and reinforce Feedback (FB) and the analysis of human and organisational factors (HOF) as progressive approaches and vectors of individual and collective learning.

- Anticipate risks: recognize and share the root causes of incidents or near-misses and implement corrective or preventive actions to avoid their repetition and/or limit their impact.
- Advance transparency and exchange through a managerial approach.
- Advance the safety culture of each of the players at his level
- Develop a management that gives players responsibility by involving them in analyzing shortcomings, identifying root causes and sharing good practices
- Support the cycle of continuous improvement of industrial safety.

In 2010 the project was supplemented by the creation of a simulator for assessing the collective professionalism of operating managers then a training course.

Finally, in 2012, the combined FB- HOF approaches will be rolled out to the 18 operational units across France.

3. The Human Factors approach

a. The general principles

The Human Factors approach is an approach to safety combining industrial safety and safety prevention. After having acted on technical aspects for decades, taking Human and Organisational Factors into account appears to be a way of advancing further in terms of safety, through a realistic, lucid approach. It is a radical approach that gives the floor to the field, and requires "a change of model" by managerial staff in terms of managerial practices.

HOFs are all the non-technical dimensions that contribute towards or influence the activity of an individual, considered across the whole of a company's organization. The HOF approach therefore considers all factors that influence his behavior.

The various sources of influence for an individual are:

- himself,
- other people (colleagues, boss and customers); his behavior depends on the behavior of others,
- working conditions (hot, cold, tools, etc.),
- the organisational framework put in place by the company (the culture etc.),
- the regulatory framework: it influences people (law =>company policy =>national then regional operating method, etc.); this also works in the opposite direction: an accident may, for example, be behind a new regulatory framework,
- human, national society, with its values (Latin culture, for example, for French society).

The consequences are that some safety mechanisms defy formalization. They remain invisible to hierarchies. They are managed by individuals and above all by staff representatives: this is the professional culture. The risk is to think that what is formalized takes care of safety.

The acceptable operating space of an organisation is marked by three borders:

- The border of acceptable costs, defined by the demands of productivity.
- The border of acceptable working conditions, corresponding to all conditions beyond which the performance of individuals plummets (through tiredness, stress, lack of motivation, etc.).
- The border of acceptable risks is the border beyond which the risks taken by the company and its members are unacceptable to customers and society. In contrast to the other borders, the border of acceptable risks is subjective, i.e. it is not precisely defined and its perception depends on people and does not necessarily correspond to the levels of risk accepted by society and industry.

Within this space, the operation of an organisation is mainly subjected to two major force fields:

- productive pressure, borne by all, which pushes for greater economic efficiency;
- the pressure of individual comfort, which pushes all members of the organisation on all levels, whatever their job, to make their work less tiresome, more interesting, better paid, more satisfying, etc.

These two forces combine to trigger a permanent "migration" of behavior towards a greater risk. To do better economically under the same working conditions, you have to accept more risks. Within the company's internal logic there is not really any counter-force on the side of safety that would naturally oppose a migration towards risk.

One way of limiting migration towards risk is to make the border of risks more visible so that everyone knows to stay within the acceptable operating framework. This is specifically the task of Human Factor and Feedback training: to clarify risks, safety margins and migrations.

b. Variation within GrDF

This approach is one of the components of GrDF's industrial safety approach. It is positioned "upstream" from FB with a view to establishing a durable and effective safety culture.

GrDF's aim is to:

- Make each employee proactive and transparent as regards individual and collective industrial safety by questioning individual behavior, work situations, staff representatives,
- Open up the floor to allow everyone to express their point of view without constraint,
- Remove the taboos surrounding error, control mechanisms of drift on the ground,
- Participate in the development of a safety culture.

It also involves encouraging a cultural change:

- Acknowledge imperfection, ambiguity, uncertainty by abandoning the dreams of perfection of direct and total control and acknowledge the need for permanent arbitration between contradictory constraints,
- Make the formal system consistent with the vagaries of real life by improving consistency between the logics of operators and managers, by acknowledging the need for cooperation, for operator autonomy, by reinforcing the capabilities of the collective (values, competence, good collective practices), by reducing pressure, operating stress,
- Restoring clarity to the organisation as regards what is actually going on in the workplace, by observing, analyzing actual activity, by developing tools for reporting and analyzing events, by measuring performance, by developing a culture of honesty and "justice", by developing trust and by reducing the role of sanctions,
- Increase the ability to manage variations in complete safety by giving direction to rules, by increasing awareness of the early signs of loss of control and by giving principles for reaction in non-nominal situations.

Our main objectives for participating in the development of a safety culture:

- Make operators responsible for the transparency and analysis of situations and behaviors
- Achieve change management through a collective construction, introduced internally to embed the approach in the culture, thereby guaranteeing its in-depth effectiveness over time.
- Anchor the new methods of exchange by rituals and rhythms piloted and guaranteed by the management, performed by peers, to introduce trust.

The motors, tools and rituals implemented:

- The approach is "self-constructed" within the unit: it is supported by volunteers, operators and management, trained for this purpose. Employees and all management show a real interest by their responses to the problems posed. The interim management, after a time worrying about its place in the system, positions itself as an active contributor of the identified solutions. It finds itself more highly valued.
- The anchoring of this approach is based on the organizers/HF relays who have helped initialize desire/the beginning of trust. It is an axis likely to succeed.
- The approach implies daily comment by the actors within the group and the manager, a summary and feedback (with solution) each week by management, traceability of operations (integration planned in the FB tool created by GrDF and named OCEANIE[3].), a documentary guide to "human factors", a monthly committee headed by the Unit Director to examine and resolve unsolved problems.
- The approach is organized at national level and piloted within each unit with national supervision.

c. The results, the key success factors

They way this approach is currently deployed at GrDF, the HF&O gains from the perspective of managers relate to:

- Improving team spirit / Living better at work
- Trust-Transparency
- Better knowledge and control of risks – disparities encountered on the ground
- Easier debriefings

The gains of the Human Factors approach from the perspective of employees concern:

- Cohesion of the group / Trust / Transparency
- Being taken into consideration by the manager
- Fewer stresses by what is left unsaid
- No phenomenon of accumulation
- Returns are taken into account, discussed and processed quickly

The role of the manager is vital. He must allow employees to be able to express themselves freely, without taboos or fear of sanctions and be reactive in dealing with problems.

From a quantitative point of view, our first analyses concern the 4 units that took up this approach in 2008. These units have returned at national level the equivalent of 2,200 analyses centered on the human factor.

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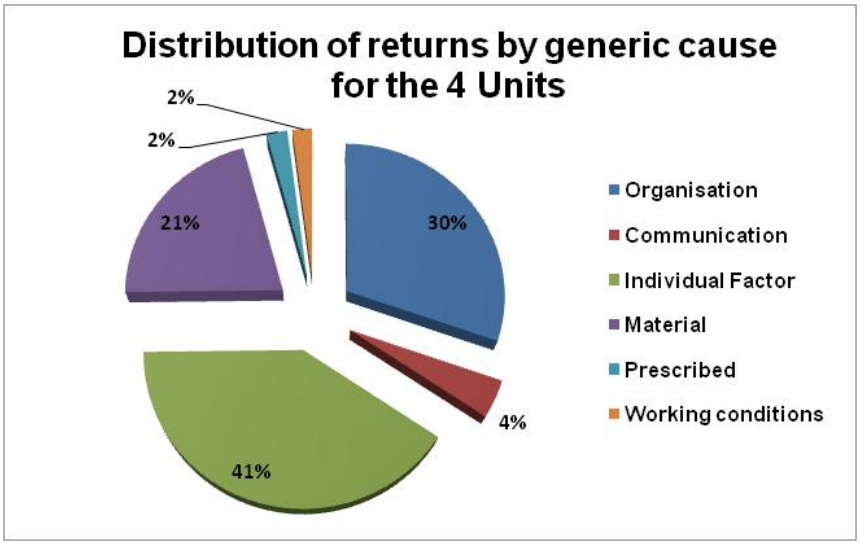
[3] *Outil de Capitalisation, d'Echange et d'ANalyse des Incidents et Evénements [Capitalization, Exchange and Analysis of Incidents and Events Tool]*



These highly promising initial results clearly show the major influence of the individual factor (41%) then the organisation (30%) and finally, with just 21% of the material, the cause historically highlighted by the past.

The HF approach is an in-depth approach, the aim of which is to develop the safety culture and social and managerial benchmarks. Based on exchange, collective sharing and the creation of trust, it allows the recovery of weak signals and good practices. It creates the ideal context for guaranteed the transparency and depth required to seek out causes during Feedback.

4. The approach of Feedback on incidents

a. The general principles

GrDF has been providing Feedback on events for several years. However, areas for improvement have been identified in the analysis methods used to allow causes to be identified and increase the investigation of non-technical causes, of the human factor and/or organisational type.

Thus, in 2008, GrDF wanted to energize and strengthen its feedback approach by involving and professionalizing all the employees in its operational units, expanding the range of events studied to operational incidents and deciding to incorporate human and organisational dimensions into its analyses.

This new method was developed using the results of the diagnosis carried out among managers, operational managers and operators involved in scheduled work and emergency gas interventions. This diagnosis confirmed that the time devoted to hot analysis combined with its lack of structure produced analyses that were often too cursory and led to a rapid convergence on generic technical causes. It also emerged that the new analysis method had to make it easier for those involved to be heard, weak signals to be detected and conditions influencing human performance, both individual and collective, to be identified.

Two key stages were thus identified in the FB approach:

- The “tell the story” stage: exchanges between the manager and the operator(s) who experienced the event closest to the incident. This sequence allows those involved to recount the events experienced factually by collective pre-defined exhaustive information. It must facilitate transparency and instill trust. It allows the manager to access the key elements and a chronology of what happened before and after the incident, the basis of any analysis, and to decide whether or not to pursue the investigation

The "cold analysis" stage: this was developed by simplifying and adapting the principle of the CREAM[4] method to the context of gas distribution. The CREAM method, developed by the Chair of Industrial Security of Mines Paris Tech, allows human and organisational factors to be analyzed in greater detail. This phase consists of collectively analyzing 11 parameters known as conditions for implementation: Damage prevention actions, Cartography and identification, Workload, Collaboration, Communication, Working conditions, Time management, Technical management, Materials and tools, Professionalism, Regulations and procedures. These conditions for implementation characterize the quality of the operators' work, taking into account their environment. It involves allowing the event to be studied in detail by stepping back and looking at the technical, human and organisational aspects with all the stakeholders in of the operational unit, indeed, depending on the situation and where possible, with external stakeholders (public works contractors, fire services, etc.).

Each Unit Director appoints, for the territory covered by his unit, an FB pilot responsible for encouraging managers to implement the managerial standards of the approach.

The managerial standards of the approach are as follows:

- The Unit Director clarifies the steering method in the Unit (organisation, appointment of persons responsible for hot debriefing and cold analysis, the decision-making chain, porterage, etc.).
- The managers support the approach and create the conditions so that everyone can express themselves and give evidence collectively to encourage interaction between stakeholders.
- The FB is organized and provided by the Unit's management. "Advisor" employees for the activity are identified to support the approach, with the role of expert (the Health, Safety & Prevention Expert, for example).
- The managers guarantee the holding and quality of a hot debriefing, which must include the "tell the story" stage, as close as possible to the event and no more than 48 hours after, separated from the cold analysis. The manager, in tandem with the operational manager concerned and based on the hot debriefing, identifies whether the event will be the subject of a cold analysis and establishes the boundaries of the analysis, which may change as the analysis is carried out.
- The person responsible for the cold analysis ensures the internal transversality required to guarantee the depth and completeness of the FB. Whenever possible, this cold analysis is organized in the week following the event, and within two weeks at most. It incorporates a posteriori analyses carried out with external parties and the information received from them where appropriate (public works contractors, fire services, regional authorities, etc.).
- The guarantees the boucle de retour, i.e. the carrying out of a check on the completeness and accuracy of the information contained in the FB with the corresponding information contained in source databases (incident management bases in particular).
- He ensures a posteriori that the root causes, aggravating factors and proposed actions are identified, and that the latter are relevant. He ensures that the FB is formalized in a communication document (clear, concise and enabling the main points to be identified).

The FB is regularly studied on the initiative of the FB pilot, in order to carry out a periodic global synthesis and share FB and decisions on action of the Unit and the significant FB from other Units. This synthesis is included in the existing rituals of the unit in order to deal with recurrent causes, reproducible or fundamental, detect weak signals, qualify the Unit's significant FB, implement actions at the appropriate level and shore up porterage to employees.

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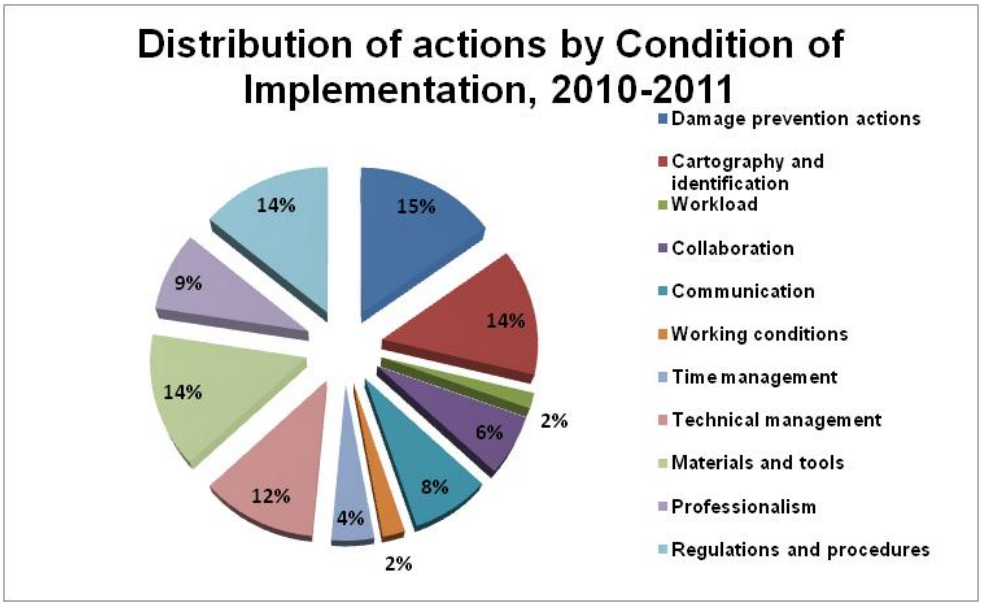
[4] *Cognitive Reliability and Error Analysis Method*

Significant FB is FB of a high general instructional value, the causes of which can be reproduced in other Units and/or for which the associated preventive or corrective actions can be generalized with the aim of improving industrial safety. They highlight “fundamental” causes (for example, of the type of fault, shortcoming or “deviance” from what is prescribed internally or operating methods), major sources of risk of repetition of dysfunction in the national grid.

b. The results, the key success factors

The rise of the FB approach was observed between 2010 and 2011 with 1160 and 1450 analyses respectively entered into our OCEANIE database.

Observation of the results allowed the main factors influencing the events analyzed to be revealed:



It is apparent that there is a wide range of causes, without a dominant theme being revealed. The following factors can nevertheless be cited: damage prevention actions, cartography and identification of structures, materials and tools, regulations and procedures.

Furthermore, from a managerial and collective point of view, 16 significant instances of FB were identified by the national level of GrDF and shared with all operational unit managers, for awareness-raising communication within their units.

Taking human and organisational factors into account in the analysis helped begin a change in mentality in the analysis of feedback within GrDF. Shifting the level of expert analysis from the national entity to those involved and the first-line managers also allowed the feedback process to be industrialized and the safety culture to be strengthened on all levels of the company.

This innovative way of analyzing events has been used for the past three years in all GrDF’s operational entities. It is industrialized on the intranet using the OCEANIE tool.

Implementing this novel approach, based on a new management method and a new way of analyzing events, enables risk control to be strengthened by better understanding events, energizing the loop for improving the management of operations and professionalism, especially via sharing in teams or learning situations. The use of the method has also led to an increase in the sharing of the safety culture between internal stakeholders, within activity communities, and externally with public works contractors and fire services in particular. Feedback is thus controlled as close to the ground as possible.

5. Training-coaching on gas distribution network management simulator

a. Context

Audits carried out in 2006 of the activity of operational manager highlighted alarm points concerning the functions associated with network management: a poorly shared and heterogeneous professionalism based on one or two competences, unsuitable local operating procedures, a chronic failure to respect network access rules, a lack of suitable tools. Furthermore, the evolution of the management system by activity produced new perspectives in terms of the evolution of operating grids and the appointment of delegated operators.

GrdF therefore developed its organisation for managing structures within the context of a project entitled “future operation”. Operational Offices (OO) were created in the operational units in an operating grid of several departments.

The Operational Manager (OM) therefore manages the networks (incident management, issuing of access permits) at a distance from the teams on the ground and with national tools adapted to his activities. He works in a team consisting of 2 (generally) assistants (AOM) and himself.

Notable developments concern in particular the geographical distance of the OM from the site of the incident, the probable management of concomitant incidents, the pursuit of team activities, the creation of 2 roles with defined activities (OM and AOM) and the strictness of the procedures to be implemented.

These changes led GrDF to design a coaching program for its teams on managing their activities, with situations being created in a framework corresponding to their normal working framework (simulator), comprising various levels of difficulty and with the aim of developing and enhancing the value of collective team competences.

b. Design of the OO Simulator

Based at a GDF SUEZ training site, the simulator, a replica of a working Operational Office, is equipped with all the instructional, office equipment, telephone and IT tools needed to produce a simulation that is as close as possible to reality. The room is divided into 2 parts: a zone for putting trainees into situations, and a zone for observation by teams of organizers.

The simulator is equipped with several workstations and telephones from which trainees can access and use the management tools at their disposal in operational units.

The “support operation” used during simulation exercises is the copy of an existing operation in France. The cartography, the operating schedule, the various management tools and other schedules reflect the actual situation.

The simulation exercises, genuine scenarios, are constructed from the generic managerial activities of an OO. The incidents with which trainees are confronted are taken from GrDF’s Feedback database.

Trainees therefore work on a proper network with the tools to which they have access in units. They have to control the routine activities of an OO and simultaneously manage incidents taken from the analysis and feedback of events actually experienced during operations (GrDF).

The ergonomics of the OOP simulator room evolve according to suggestions for improvement from trainees at the end of sessions. A veritable “laboratory”, the lessons learned from these simulations allow the equipment and operation of the various OOs in units and internal requirements to potentially be developed.

The team of organizers consists of Energy Training professionals (Gas Technical Activity Training Body of GDF SUEZ), practicing full-time, technical experts from GrDF, Operational Managers who advise the operational units of GrDF. These employees were appointed by

their Unit Director as reference Operational Managers within their units. Training is organized by an Energy Training pair and either a technical expert or an advisory OM.

Operational Simulation and Assessment Tool used in national formation center for training of workers of the same operation office	
	
A sight of the room of simulation with three trainees stemming from the same operation office of operational unit: a leader of operation and his two assistants. They have the same computing tools as on their workplace - in 1 and a half days, they are subjected to two scenarios, one of the warm-up and one more complex to manage with simultaneous incidents. Every time, a sequence of analysis with the trainers at the end of scenario.	A sight of the control room of the trainers with at the bottom the internal glazing allowing to observe the behavior of the trainees during the scenarios. Two trainers send successively computing or phone messages translating events on the network and the third trainer is only observing the way the trainees get organized to manage the feigned crisis.

c. Collective simulator training

This training was introduced in April 2010.

The team of trainees must quickly take the necessary steps to:

- secure the zone and guarantee the safety of persons, staff and property
- assess the importance and consequences of the incident form a technical and media point of view and take the necessary measures,
- inform the on-duty management if necessary,
- not impede the handling of other activities (issue of work permits, hand-over of structures).

As of 2011, 7 scenarios are available and may evolve from a basic to a more complex level. They correspond to the occurrence and management of incidents with a gradual degradation based on actual cases experienced on the ground.

They adapt to the hand of teams of organizers according to the desired level of difficulty and depending on the decisions taken by the trainees to take account of the impact of their actions on the simulated environment and lead them to reflect on the relevance of their individual and collective choices.

At each stage of the event management, control points are put in place to assess knowledge, how well the procedures have been learned and the use of the tools. Their operation should

allow trained employees to test their knowledge of the key aspects of their mission and improve their ability to control disrupted situations.

It is also a matter of testing the management at a distance from the safety of those involved, the prioritization and distribution of the information to be analyzed, the sharing of activities.

The collective training assessment tool is based on the CREAM method. This phase of self-assessment is an integral part of the learning process.

The objectives of this method are:

- To improve the quality of training,
- To transport the conclusions of the sessions into real work situations,
- To improve the operation of the teams with the OOs.

It comprises 4 major stages:

- Discussion on the content of the sub-criteria,
- Assessment of their impact on the situation experienced. The trainees assess each sub-criterion collectively (consensus to be obtained among trainees). This choice enables the cause of the trainees' problem to be identified. It concerns both the conduct of the simulation and the simulator itself.
    - Trainees' comments on their performances, their practices in work situations, and the changes to be made. The trainees comment on the operation of the simulator (rendering of realism in particular), their practices and development, explain their assessment choices, comment on the positive points that will benefit all (learning approach).
- Suggestions for improvements with 2 dimensions:
    - The operation of the group: identification of strong points/areas for improvement within the group. This point serves to centralize all the comments on this operation and will act as a "memory" to progress.
    - The operation of the simulator; this forms part of a global learning approach. Identifying areas for advancement is vital to continually adapt it to the operational context of the OOs and make it a precise, functional and learning tool.

The role of the team of organizers is to arouse the interest of the trainees (Discussion phase), encourage exchange and discussion (Discussion phase), recall facts not/insufficiently taken into consideration and share and highlight good practices (Evaluation phase).

In terms of risk management and based on the ability levels to be developed to perform the tasks of OM and the activities of AOM, the results expected from the people trained are:

- Level 1 know and apply the operational procedures (implementation)
- Level 2 know and apply the operational procedures in deteriorated situations (loss of tools, problem with resources, etc.)
- Level 3 adapt the reference system to the situation (work outside procedures)

The course using the OO simulator lasts 1.5 days (over 2 days). It is built around the implementation of 2 scenarios that are graded in complexity. After phase involving clarification (training objectives, operating method, and ethics) and discovery of the simulator environment, trainees are placed in a work situation (discovery of workstation, the network on which they will be working, the tools at their disposal, the generic organisation of the support operation, potential players/contacts, etc.)

During 2010-2011, 73 sessions were carried out involving 222 trainees from 26 of the 31 functioning OOs.

The FB given to date has shown:

For the trainees:

- The OO simulation tool is considered to be close to reality and relevant.
- Trainees join in the “game” very quickly. Their behavior becomes natural, which makes it easier to work on individual and collective behavior.
- The simulation exercises proposed are close to reality, the scenarios are consistent.
- The trainees identify areas of progress in their practices, their work in a team and for the organisation and operation of their OO.
- The unknown environment (contacts, networks) allows trainees to prepare themselves for difficulties of which they are unaware.

For the teams of organizers:

- The scenarios must be prepared thoroughly, especially their potential sequences, the roles to be played, the potential level of complexity to be achieved, the objects and situations to be observed, etc.
- During the simulation sessions, the two-person team of organizers must continually adapt, according to what is observed, the increasing difficulty of the scenarios and the objectives to be achieved.
- After the simulation sessions, in a few minutes, the teams of organizers must draw up the debriefing plan, identify those procedures that were poorly managed to mention to the trainees, list the behaviors observed to suggest areas for improvement to strengthen the operational efficiency of the group and individuals.

Some general observations:

- The time factor during simulations is important. The periods between each time trainees are called on are deliberately shortened. Activities that cannot be compressed therefore become more dense. Trainees are called on more often than in reality. It generates a phenomenon of high stress. The teams of organizers must remain vigilant on this point and not create too much tension within the training group,
- During the sessions, unplanned events may occur: loss of connection of IT tools, unavailable IT tools, fire alarm, etc. These events contribute towards training in a disrupted situation.

The data collected feed the national expertise on how work teams function in OOs, both for detecting and implementing actions to improve professionalism and to validate organisational schedules in disrupted situations.

The investment for creating the simulator was EUR 30,000. The training course design was EUR 130, 000. The training is billed at EUR 1,700 per trainee in 2011. Globally, this training works out at EUR 500,000 a year (excluding investment) for GrDF.

d. The potential of creating value

The expected gains concern the management of risk and industrial safety. Collectively, the OO teams learn to manage events “in disrupted situations” on the simulator; in exercises leading to the management of their stress in a situation “as close as possible to reality” and with no impact on people, staff or property. Individually, trainees improve their professionalism, for themselves and for the service of the group.

The OO simulator, a replica of a real OO, can also be used as a back-up site and Operational Office laboratory for certain new IT applications.

Its development also allowed the creation at the end of 2011 of a new training course within GrDF. The introduction of the OOs in 2008 took place based on existing local competences. In 2011, it was noted that the population of OMs and AOMs was entering a phase of renewal (retirement, end of mandate) that affected all 30 structures.

It was therefore decided to support this renewal by creating an OM academy based on the principle of promotions for a period of 6 months. The content of the training consists of both specific courses, immersions within operational units and individual and collective assessment using an OO assessment tool.

The use of the simulator fits into the initial training of OMs and AOMs. The aim is to provide employees with no gas knowledge with the abilities to perform the role of OM. The training includes inputs of knowledge, know-how and life skills through the performance of activities in the simulator (simulation exercises) in teams. Furthermore, at the end of training, trainees will be assessed in how they perform their activities as OM and AOM.

The simulator exercises must enable trainees to learn how to perform their tasks while working in teams in order to manage access to the network and operational incidents.

Individual and collective assessments in the simulator complete the 6-month training and lead to the issue of a pass mark that allows the trainees to perform the jobs of OM and AOM.

6. Conclusion

If the technical aspects of risk management are now effectively controlled in most natural gas distribution companies, the same cannot be said of the actions of operators in their everyday activities. The human factor, in the sense of “behavior and mentality” but also “competence and professionalism”, is a lever for action that is that is today identified as major in any Industrial Safety policy.

For GrDF and in the context of its approach to managing industrial safety, the FB and HF approaches are clearly basic approaches, the aim of which is to advance the safety culture and it social and managerial benchmarks within the company. They are based on exchange, collective sharing and the creation of trust. They allow the recovery of weak signals and good practices. They create the ideal context for guaranteeing the transparency and depth required to seek out causes during Feedback. After a successful experimental phase in one of its 18 units, GrDF rolled out the deployment of its Human and Organisational Factors approach to all its units in 2011.

Simulator training in carrying out team activities is an affective addition to the system, and has proved to be something that facilitates change management and improves the professionalism of operational players.

By continuing to develop its activities, GrDF is pursuing the objective of developing the culture of the “world” of operation and engineering towards a culture of risk management, of enrichment through feedback (FB) and analysis of human factors, of rigor in procedures and individual and collective responsibility. The road is long, and anchoring the system among employees and management requires patience, courage, tenacity and self-denial. These truly are managerial approaches that place Man at the heart of operations and advance the “resilience” of the players in the industrial safety chain within GrDF in a vision of sustainable performance.