

Jean-Marie ROUSSEAU - IRSN

Safety management in a competitiveness context

Assessment context

- Overall context (2005/2007)
 - EDF as a “private company” (80% of assets still owned by gov.)
 - Deregulation of electricity market
- “Safety management of EDF reactors in a competitiveness context” presented (24 April 2008) to the advisory committee (“groupe permanent”)
- The first time this topic has been addressed with such a coverage

The assessment performed by the IRSN (1/3)

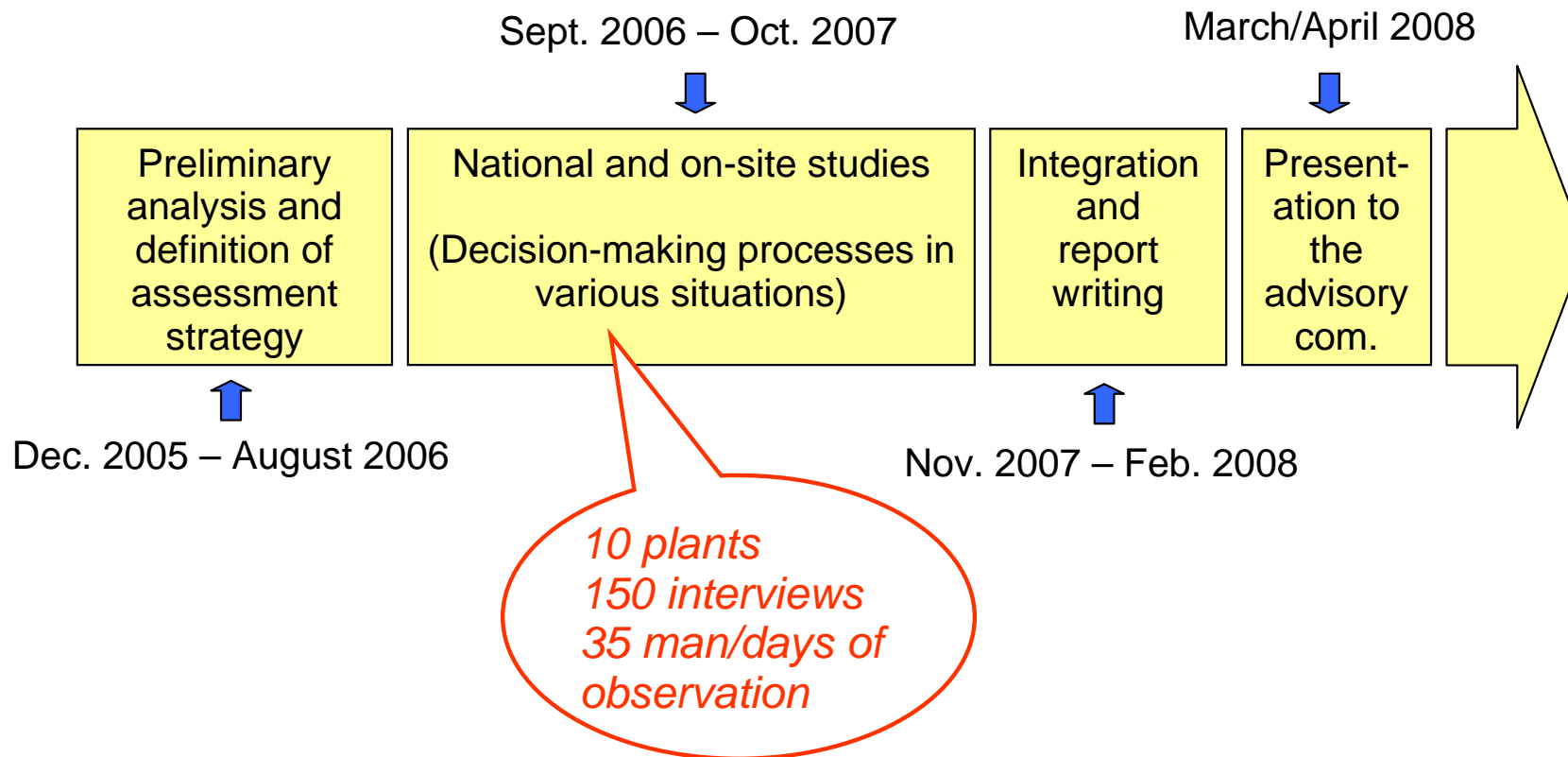
- An overall approach: comprehensive assessment
 - How the organisation runs, understanding the difficulties of the actors and their origin
- A “guiding line”
 - SMS viewed as an organizational framework for taking into account safety requirements in day-to-day decisions → focus put on **decision-making processes**
- 3 main questions have oriented the assessment:
 - How real is the “priority given to safety” in the daily arbitrations, with respect to the other operating requirements such as costs, production, and radiation protection or environmental constraints?
 - Knowing that the managerial and organizational contexts are submitted to frequent evolutions, is safety still meaningful to operators?
 - Is EDF still able to maintain a “continuous improvement” of safety?

The assessment performed by the IRSN (2/3)

- 6 “studies” involving the national level (headquarter) and the on-site level (NPP) to evaluate decision-making practices (and the way safety is considered in these practices):
 - **Real time decision-making** during unit outage;
 - **Decision-helping** provided by the headquarter to the plants to solve technical problems;
 - Use of **indicators for managing safety** (considered as decision-support tools for managers);
 - **Internal safety assessments** and use of the results for improving safety;
 - **Examination of an experience feedback tool** dealing with *a posteriori* analyses of decision-making processes, implemented by EDF (the way EDF learns from its decisions);
 - Identification of **safety representations** used by plant personnel in decision-making.

The assessment performed by the IRSN (3/3)

- Assessment schedule



Some issues and recommendations

- Real-time decision-making capabilities of plant managers
- Management of cultural changes
- Other topics (not deepened)

Managers' decision-making capabilities (1/3)

- Assessment context
 - Managers at different hierarchical levels: head of departments, proximity managers, team leaders
 - The question of the pressure exerted on the managers has appeared with different aspects during the different studies of the IRSN

Managers' decision-making capabilities (2/3)

- 5 main sources of pressure have been identified
 - “Natural” pressure coming from the industrial continuous process
 - Managers have to satisfy simultaneously “aligned objectives” (safety, security, protection against radiations, protection of environment, production objectives, cost optimization, etc.) → **responsible for the integration** without explicit criteria to do it...
 - Continuous improvement strategy: most of the new measures set by EDF over the last 10 years have strongly impacted the managers' workload
 - Variety of monitoring/assessment dispositions implemented in the nuclear domain, both internal (from national level, in-site safety control, etc.) and external (safety authority regulation, WANO, IAEA) → control as source of pressure!
 - Current external conjuncture: experienced people retirement + difficulties in the recruitment of “nuclear competences” whereas plant ageing is generating new technical problems to cope with

Managers' decision-making capabilities (3/3)

- Main issue
 - Pressure effects on people: difficulties for arbitration (aligned requirements), fatigue, frustration, worry, and potential loss of motivation → risk on decision-making capabilities
- What could be done?
 - First: the issue of pressure must be considered and analyzed regarding its origins and its effects on people → avoid the reflex consisting in denying this phenomenon
 - Then: necessity to introduce some “breathing times” in the improvement strategy in order to set means able to “qualify” the pressure and its effects → preventing its impacts on people and their capabilities for deciding and explaining their decisions, preserving time and places for debate...

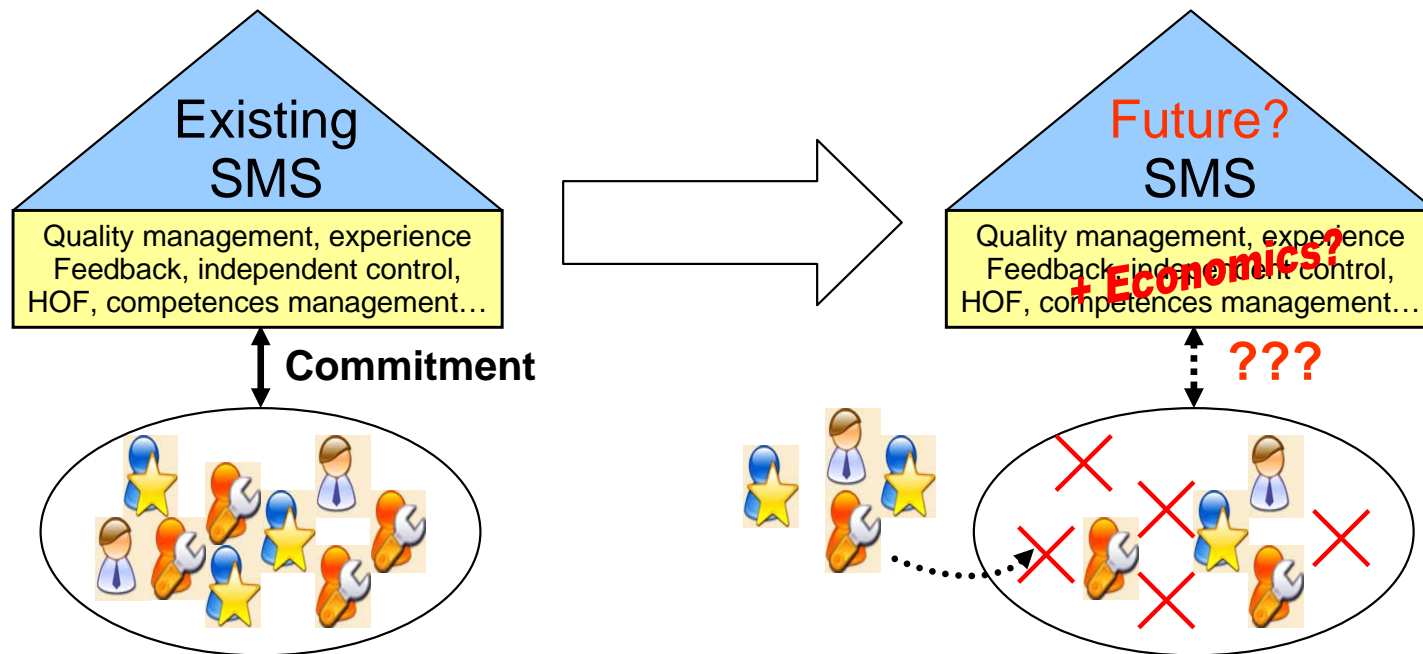
Management of cultural changes (1/3)

- Assessment context
 - This point is transversal to the different studies performed by the IRSN
- Findings
 - The current efficiency of the EDF SMS relies on the actors' commitment to the values progressively constructed
 - The cultural characteristics (values, norms, beliefs, practices, etc.) carried on by the SMS are shared by the current staff
 - Two main sources of change are currently threatening this “cultural balance”:
 - An important renewal of the EDF population
 - A reinforcement of the “technico-economical values” dues to a search for competitiveness, likely to modify the existing culture of people

Management of cultural changes (2/3)

- Main issue

→ Then, the question of the continuity of such adequacy is raised



- This foreseen evolution is often mentioned by the operational actors, but it is often minored or sometimes ignored. Consequently, the phenomenon is not explicitly managed and poorly taken into account for defining new dispositions

Management of cultural changes (3/3)

- What could be done?
 - At least, some questions have to be monitored:
 - What will be the impact of population renewing on current culture?
 - What will be the impact of the integration of “technico-economical” aspects on safety culture? Is it compatible?
 - What will be the consequences of these changes in terms of adaptation of the SMS?
 - What will happen during the transition period before the changes completed?
 - Some existing works could provide « tracks » to be used:
 - NUREG CR-6735 (2001), INSAG-18 (2003), consultancy works (change management), sociological researches (Weick, ...), etc.

Other topics (not deepened)

- Presented to the advisory committee
 - Balance between the shift operation team and the outage project team
 - Improving the experience feedback get from the analyses of decision-making processes;
 - Managing the complexity of rules/instructions/procedures and their effects on decision making;
- Identified for further assessments
 - Management of spare part stock (organisational impacts); Position and power of internal independent assessment staff; Operational implementation of INSAG 18 for managing organizational changes; Implementation of the EDF project on “human performance”.
- Some positive findings
 - The dynamic attitude concerning questions of safety; the genuine commitment of the staff to safety; the capacity of EDF to adopt a "project mode" in order to de-compartmentalize its organization for a specific purpose; the complementarities of the verification/assessment dispositions; the organized multiplicity of viewpoints, bringing diversity into the decision-making process.

Conclusions: answering to the 3 directive questions

- Priority given to safety:
 - the motto is not really operational → there is an “integration process” considering multiple requirements to establish a trade-off, in certain situations safety stakes are not “visible” (so priority can’t be given to safety...)
- Meaning of safety:
 - constructed, multiple (potential source of conflict), but “sense-making” is still possible. A threat to deal with: the on-going cultural change...
- Ability to improve safety:
 - interactions between vulnerabilities in a context characterized by the increasing complexity of the technical and organizational baselines and increasing search for competitiveness threaten the efficiency of the SMS. It seems that the dispositions recently set up by EDF are responses for dealing with these “aggressions” → safety is not improved, it is just maintained at an acceptable level...

Conclusions: lessons learnt

- Examining detailed “stories” of decision-making processes constitutes a valuable approach to:
 - Go further than quality insurance approaches based on compliance verification principles;
 - Assess the efficiency and the relevance of the SMS components on operational safety management in real-life situations;
 - Get usable traces of beliefs, values, representations and more generally all “hidden faces” composing safety culture.
- Performing comprehensive assessment provides a valuable complement to inspections for HOF related topics
 - ➔ TSOs have a specific role to play – aside to the regulatory bodies – within the global safety assessment strategy