



IRSN

INSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

COMPATIBILITY OF SAFETY AND SECURITY

Sydney 5-9 November 2007

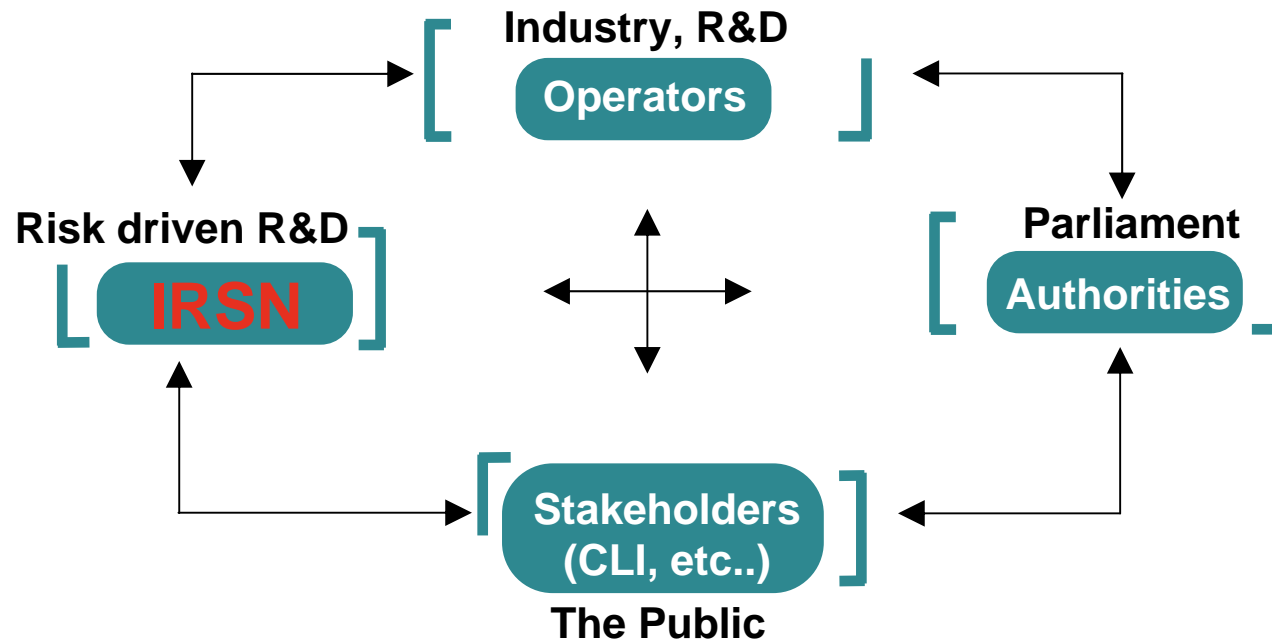
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Presentation summary

1. IRSN: National TSO in support to both safety and security authorities
2. Safety and Security: more commonalities than differences
3. Key organisation principles
4. Implementation : how to maximize synergies
5. Conclusion

IRSN: the French TSO

- A clear status within the regulatory framework



- a wide field of competence allowing a broad vision of safety, security and radiation protection issues
- risk assessment capability at the heart of IRSN's R&D and operational support missions
- a strong international involvement
- 1700 people, 280 M€ budget

Safety and Security: more commonalities than differences



- **A synergy in the field of sabotage**

- **Safety:** “The achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation hazards”
- **Security:** “The prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities”

⇒ *Safety and security have a common field to protect against sabotage and are mutually complementary in this area*

- **A common aim: the protection of man and environment**

⇒ *The acceptable risk must be the same whether the initiating event of a given radiological release results from a natural event, equipment failure, or from a malicious act*

Safety and Security: more commonalities than differences



- **Equipment or human failures / intentional actions**
 - Safety is primarily concerned with failures resulting from natural events, equipment failures, installation internal events or human failures
 - Security is concerned with malicious events based on possibly ingenious and adaptable actions, carried out with the intent to cause damage
- **Transparency / confidentiality**
 - A same need to share know how and experience exists in both areas, but:
 - ✓ safety promotes wide sharing of experience feedback
 - ✓ security requires the protection of information

Safety and Security: more commonalities than differences



- A legislative and regulatory framework for safety as well as for security :
 - Implement an authorization system
 - Assess provisions implemented by the operators
 - Implement an inspection system
 - Observe international commitments
 - Designate and empower a national authority
- ⇒ *These provisions may depend upon the same legal vector but are frequently subject to different regulations and authorities respectively for safety and for security*

Key organisation principles



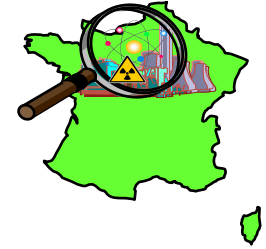
- **A competent authority for safety as well as for security**
 - Responsible for implementation of the regulation
 - Empowered with the adequate enforcement authority, competence and resources
 - Independent from entities promoting nuclear energy
 - In charge of :
 - ✓ definition of goals to attain,
 - ✓ control and assessment of operators' activities.
- **One or two competent authorities ?**
 - ⇒ *A consultation and coordination mechanism is required if there are two different authorities for safety and security*

Key organisation principles



- **Prime responsibility of operators for safety as well as for security :**
 - Design, implement and maintain measures to satisfy regulatory requirements
 - Ensure first level control
 - Ensure skill and appropriate training of personnel
 - Inform the authority of events likely to affect safety or security
 - Implement a quality system
- ⇒ *This responsibility cannot be delegated in either area*

Key organisation principles



- **A different involvement of the State**

- The State is a multiple actor in the field of security:
 - Definition of design basis threats
 - Assessment of malicious act risks for each facility
 - Law enforcement agencies routinely participate in the prevention of risks
 - In charge of the deployment of public response forces
- Many State bodies may take part in the management of a crisis resulting from a malicious act
- The State defines rules for confidentiality and information protection

⇒ *A broader and more direct involvement of the State in security than in safety*

Key organisation principles



- **Safety and security cultures**

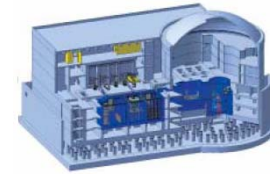
- Based on very similar principles
- Apply at 3 main levels: State, Operators, and individuals
- Notions of deterrence and confidentiality are specific of security
- Notions of transparency and open dialogue are specific of safety

⇒ *The 2 cultures must co-exist and back each other up*

⇒ *Synergy between them must be developed and encouraged*

⇒ *But it should not be attempted to merge them into a single one*

Implementation : how to maximize synergies



- **Build on similarities in the design process...**

- The graded approach

- ✓ Define measures appropriate and proportional to the estimated risk and its potential consequences
- ✓ Design Basis Accident (DBA) for safety and Design Basis Threat (DBT) for security

- The defence in depth

- ✓ Set up consecutive barriers whether physical or organizational
- ✓ Physical safety defence lines often directly linked to the process / security apply to the entire site

⇒ *A first line of defence for security consisting of deterrence provisions*

Implementation : how to maximize synergies



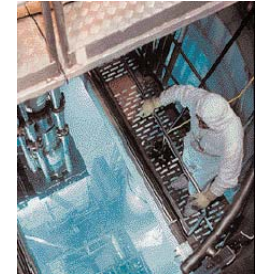
- ... in order to optimise the facility from both safety and security perspectives
 - Safety is more structuring during design phase than security
 - ⇒ *For research reactors, safety design for containment take into account BORAX accident*
 - Safety design principles reinforce security (single failure criterion, redundancy, diversification, physical and geographical separations,...)
 - ⇒ *Reduction of the sensitivity of targets and more difficulties (time and means) to perpetrate sabotage*

Implementation : how to maximize synergies



- **Highlight similarities in operating provisions**
 - A same need to treat the experience feedback
 - ✓ events concerning equipment failures, identified anomalies, human errors and sabotage must be recorded and processed
 - ⇒ *For research reactors, the challenge in experience feedback due to diversity of types calls for a regional approach.*
 - A same need to update the basis rules
 - ✓ Necessity to re-examine periodically the status of installations and update devices and rules
 - ⇒ *For research reactors, the need is strengthened by the age of many of these installations. International best practice should be carefully monitored.*

Implementation : how to maximize synergies



- ... without obliterating some distinctive operating specificities of safety and security
 - exchange of information on good practice is essential but...
 - ✓ For safety, encourage wide sharing of information
 - ✓ For security, restrict exchanges to authorised personnel
 - ⇒ *For research reactors, difficulties due to the presence of research teams can be reduced by a clear separation between reactor operations and scientific programmes operations, with a controlled policy for transparency of safety related matters.*
 - Potential conflicts need to be addressed at an early stage
 - ✓ to define the best compromise between safety and security requirements in operating rules and procedures
 - ⇒ *Special protection systems for sensitive zones / possibility to evacuate personnel urgently in case of fire or criticality risks*

Implementation : how to maximize synergies



- **Through emergency management**

- Emergency and contingency plans should have much in common:

- ✓ Operators and Public Authorities are concerned in both cases
- ✓ Plans should be complementary and coherent

⇒ *Contingency plans constitute a specific line of defence for security, upstream emergency plan*

- Performance of exercises should strengthen coherence

- ✓ Similar aim : validation of plans and training
- ✓ Similar types : local or national exercises

⇒ *Global exercises can confirm the quality of coordination of safety and security organizations*

Implementation : how to maximize synergies



- **By maintaining a single ISO 9001 quality system**
 - Quality system should not differ from the standpoint of principles and should take safety and security into account at the same level
 - Quality processes can however address particularly one of the two fields
 - Specific result indicators should be set for safety and security issues

CONCLUSION

1. Nuclear safety and nuclear security are similar in their aim and in their methods, and are complementary for sabotage prevention.
 - Regional and international exchange on some security issues under the scope of the Code of Conduct for RR could facilitate the extension of regional research programmes for safe and effective RR utilisation
2. Specific attributes in some areas lead to implementation differences.
 - Conflicts can be minimized by coordinating both approaches from the design stage through the whole life cycle of RR
3. The diversity of research reactors requires to adapt safety and security provisions so as to fit with the characteristics and the risks of each RR.
 - Regional experience feed back programmes should be encouraged by IAEA
4. A well shared combined safety and security culture is, particularly for research reactors, a primary condition for a safe and secure operation.
 - IAEA should be invited to further develop security oriented guidance, to encourage the spread of security culture, particularly in RR environment