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Towards Convergence of Technical Nuclear Safety Practices in Europe

# The role of the TSOs in the context of increasing demand for safety expertise

# Expectations of the NPP operators

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# Preliminary remarks

**It is not an easy exercise to present, on behalf of NPPs operators, the expectations about the role of Technical Organizations (TSOs) which support their respective Regulatory Bodies (RBs):**

**- the expectations bear on the whole process which govern licensing: RB, TSO, rules, procedures…**

**- the organisations between RB and TSO can be multiple: dedicated TSO, consultancy or expert entity on technical issues…**

**The presentation will focus on expectations concerning key points and role of TSOs related to:**

**- skills and competences, with the necessity for broad systemic views regarding safety issues,**
***in the light of IAEA Safety Fundamentals (IAEA - SF1)***

**- the whole licensing and regulatory framework, for an efficient safety management in a competitiveness context,**
***in the light of current ENEF working groups with involves industry and operators ( 0pportunities and Legal Roadmap WG…)***

**- for the future, and to foster nuclear renaissance, integration of harmonisation and standardisation in the licensing process and in the respective actions of TSOs and RBs,**
***in the light of recent initiatives by RBs (MDEP, Wenra) and Industry (WNA, Cordel WG).***

# The role of the TSOs
# in the context of increasing demand for safety expertise
# Expectations of the NPP operators

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# Introduction

**The action of the Regulatory Body (RB), established as independent, and its TSO is essential for the nuclear operator, which bears the prime responsibility for safety** (IAEA SF1 - Principle 1)**:**

**1/ Importance of the role and competence of the RB and its TSO in the establishment of an efficient overall safety regime, which is essential for long term operation and efficiency of NPPs,**

**2/ Importance to develop an efficient relationship with ASN and TSO, so as to enable the Operator to fulfil its safety responsibility while maintaining competitiveness, which means:**
**. (i) to have a clear definition of safety objectives, as defined by the RB,**
**. (ii) to be in a position to propose the best technical and cost effective means to attain them,**
**. (iii) to implement those means, after examination and approval by RB,**
**. (iv) under control by RB, while favouring experience feedback;**

**3/ Importance to have efficient working procedures between TSO, RB and responsible operator:**
**. to have a clear working framework for an efficient management and planning of the review and resolution of safety issues, in a reliable, predictable and balanced way;**
**. to focus actions in a graded approach, according to their respective impact on safety, so as to maintain industrial efficiency in the whole safety management process.**

**4/ Importance of developing a good mutual understanding and reliable relationships, based on mutual recognition of respective competence, role and responsibilities.**

# The role of TSOs through the IAEA Fundamental Safety Principles

"The fundamental safety objective is to protect people and the environment from harmful effect of radiation, .. without unduly limiting the operation of facilities or the conduct of activities that give rise to radiation risks"
*(nb: under condition of justification that the benefits outweigh the risks - principle 4)*

"The regulatory body (RB) must have legal authorithy, technical and managerial competence, and human and financial resources to fulfill its responsibilities." (principle 2)

==> The role of the TSO appears primarily as an entity or organization which is established to bring its "technical and managerial competence" to the RB, in a way that respects its independence.

which means:

1/ that a competent staff is in place to perform licensing of the sites, review, assess and license nuclear plant designs;

2/ a broad scope of competence, not limited to technical specific issues ==>

# The role of TSOs through the IAEA Safety Fundamentals

• **The assessment of safety is not just a matter of "black or white" issues:**

**- it has to weigh the proposed options both in a conservative, realistic and balanced way**

**- it has to take into account the pragmatic "in the field" knowledge, human performance, man machine interface or organisational issues (principle 3: leadership and management for safety).**

• **The required competence must encompass a broad and systemic scope:**

**- safety has to be assessed, consistent with a "graded approach" (principle 3) according to the importance of risk involved, with a clear link between analysis, regulations and safety objectives;**

**- to assess the "optimization of protection to provide the highest level of safety that can reasonably be achieved through the lifetime of the facility, without unduly limiting its utilization" (principle 5) and with a reasonable degree of assurance;**

**- to assess defence in depth through a number of independent levels of protection (principle 8) and with a reasonable degree of assurance.**

**==> the fostering of these competences implies continuity and benchmark**

# Licensing and Regulatory Framework

The technical dialogue with ASN and TSO, within the licensing and regulatory framework, must ensure that regulatory decisions are:

**Predictable:** the requirements must be clear in advance, set forth in clear and realistic rules and regulations, in a manner consistent with the degree of risk reduction they achieve

**With a balanced level of details:**

too detailed <=> infringement on operator's responsibility / undue constraints
too vague <=> less predictable

**Reliable and stable:** once regulatory decisions are made, they are not altered afterwards – unless substantial new information shows that additional measures are necessary.

**Timely:** licensing and regulatory decisions are made without undue delay in a planned timescale, so as to lend stability to the nuclear operational and planning processes.

**Internationally aligned:**

. to reflect the multinational deployment of NPPs and foster industrial efficiency and competitiveness,
. in a context of worlwide benchmark and transparency, to increase public confidence.

# Licensing and Regulatory Framework

Two examples in France

The ten years periodical safety reassessment process:
A systematic approach, required by june 2006 law on safety and transparency:
- an orderly reassessment and updating of the licensing safety basis;
- to maintain and improve in the long run the safety level of NPPs, using a cost benefit analysis;
- to anticipate with RB in a predictable way, while stabilising for next ten years;
- to assess the judgment on plant operation in the long run (40 years and further).

The EPR examination process:
Definition of an assessment program (submission of technical files, technical meetings, TSO's recommendations, standing group meetings, RB decisions...) with two objectives:
- for the operator: to minimize the industrial risk with an examination program defined in accordance with the industrial milestones;
- for the TSO: to anticipate the examination of the different key points of the safety report before plant commissioning.

# Approaches in the context of nuclear development: standardization for New Build

Benefits gained through standardization of design
- for nuclear safety, regulators and licensing process
- for stakeholders: industry, public, electricity consumers

Experience of the operation of large nuclear fleets of similar plants has demonstrated the benefit of standardization to achieve higher levels of safety:

- In the design phase and construction phase: quality, proven methods and controls, involvement of suppliers …

- In the operational phase: experience feedback (operation, training, maintenance..), international owner's group, sharing of reliability data, event analysis, periodic safety review and lifetime assessment

- early detection of any design or fabrication shortcoming: rapid accumulation of experience enables effective early rectification (cf aviation industry).

# Approaches in the context of nuclear development: standardization for New Build

**Harmonization of national nuclear safety standards facilitates the deployment of internationally standardized reactor designs**

**Standardized designs provide benefits in national regulatory processes, and ways of action for RBs and fields of competence for TSOs:**

**- increased effectiveness and efficiency of regulatory design reviews:**
**sharing methods and data arising, mutual acceptance of safety review for a standardized design;**

**- mutual sharing and efficiency for quality inspections: harmonized requirements in construction and manufacturing, involvement of contractors worldwide**

**- knowledge transfer on regulatory issues and practices:**
**harmonization of rules facilitates the development of nuclear energy in emerging countries,**

**- increased international cooperation among regulators leads to better understanding of different regulatory options and common choice of the most convincing and reasonable solutions,**

**==> Without the need for additional regulatory layers**

# Approaches in the context of nuclear development: standardization for New Build

International initiatives by RBs with TSOs

. IAEA: drafting of international safety standards

. WENRA: elaboration of safety reference levels to promote harmonisation

. High Level Group at European level on safety harmonization

. MDEP: Multinational Design Evaluation Program

- 10 regulators from new-build countries worldwide (in EU: UK, France, Finland)
- Aim: convergence of regulatory approaches in review of reactor designs and in related areas
- Design-specific and issue-specific working groups

International Initiatives by Nuclear Operators and Industry:

. CORDEL (WNA WG): Cooperation in Reactor Design Evaluation and Licensing

- reactor vendors and utilities worldwide, to
- to promote benefits of standardization and establish a dialogue with regulators (MDEP)

. EUR: European utilities requirements

- established in 1992 to define a harmonized set of safety and performance objectives for future reactor designs to be deployed in Europe

. ENISS: created in may 2005 within Foratom

- to enable the industry (utilities, fuel cycle facilities operators) to discuss the harmonisation of standards with WENRA.
- participation in IAEA safety standards work (NUSSC, WASSC)

# Approaches in the context of nuclear development: standardization for New Build

Areas for Future Work on Harmonization and Standardization

- mutual acceptance of design reviews to ease the licensing process of standardized designs;

- bilateral exchange for a given standardized design between RBs and TSOs, to begin with and to gain experience;

- in the longer term convergence of licensing procedures as well as safety standards;

- harmonization of component manufacturing oversight / vendor inspection;

- industry participation in IAEA safety standard revision process;

- harmonization of standards and codes, deriving from internationally recognized safety fundamentals, with operators and industry involvement.

# Conclusion

The role and competence of TSOs are essential

- to assess long term operational safety of existing plants, in a competitiveness context

- to assess the integration of experience feedback in the design of future NPPs

- to maintain a knowledgeable and adequate assessment basis, and continuity in the analysis, while focusing on important safety issues;

- to maintain efficiency in the licensing and regulatory process.

For the future,
work on Harmonization of rules and to facilitate Standardization for new designs should enable to ease the regulatory safety review workload in the context of increasing demand for safety expertise, by sharing analysis, and to gain efficiency in the licensing process for New Build.