Developing Technical and Scientific capabilities of TSOs supporting Regulatory Functions in embarking countries

- NMPS - NSOC
- Department of nuclear safety and security
Content

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**Rationale**

- The international Conference on Challenges Faced by Technical and Scientific Support Organization (TSOs) in Enhancing Nuclear Safety and Security, which was held in Beijing in October 2014 with 200 participants from 42 Member States, recognized that the Technical and Scientific function is a critical component of the regulatory system. The conference concluded that Member States should have the possibility to evaluate the capabilities of their national technical scientific support function through peer review missions, either in the context of IRRS mission or in another way, to be identified (e.g. dedicated TSO missions). It also concluded that the TSO Forum (TSOF) could contribute to the building of capabilities of newcomer countries.

- As a follow-up of the TSO Conference in Beijing, the Steering Committee of TSOF decided in March 2016 to develop an action related to the capacity building of technical and scientific organisation of embarking countries.
The Steering Committee supported the idea and decided to develop such services with a specific focus on the TSO with at least two different levels of actions:

- The development of TSO experts missions for embarking countries intending to develop their TSO capabilities
- The development of TSO specific modules to be added in existing peer review missions such as IRRS and INIR.

The Steering Committee also suggested to evaluate the need within embarking countries.
Proposed Objectives

1. Experience sharing and Discussion among the expert on their experiences with embarking countries needs in the field of TSO capability.

2. Gap analysis on existing IAEA missions and tools linked to TSO capabilities

3. Recommendations for future steps.

Deliverable
A report addressing the objectives (1), (2) and (3).
Rationale

Requirements to the experts
Experts having significant experience in the Technical and Scientific Support for Regulatory Bodies are invited to the meeting. For the meeting, the experts will be requested:

1. to present their experience feedback in peer review missions and expert missions developed by the Agency (such as INIR, IRRS and other experts mission in capacity building) and/or in other peer reviews and their experience feedback in developing support to TSOs for Regulators of embarking countries;

2. to present proposals addressing the support of the technical and scientific capacity of TSOs in embarking countries.
Summary session 1 - Experience sharing and Discussion among the expert on their experiences with embarking countries needs in the field of TSO capability

chaired by Eija Karita Puska VTT Finland
Countries / TSOs gathered

- 1 advanced embarking country: VARANS – Vietnam
- 5 countries with existing/past strong nuclear industry:
  - US NRC – US,
  - IRSN - France
  - CNSC – Canada
  - SEC NRS Russian Federation
  - GRS Germany
- 1 country with long history of using NPPs:
  - VTT – Finland
- 2 international organisations:
  - ENSTTI
  - JRC
VARANS: Experience in expert missions and expectations in TSO capacity building from the side of embarking countries

- An excellent presentation on the current situation in Vietnam
- The lessons learned part was taken as the basis of discussion and summary by the group
Others: Experience in expert missions and lessons learnt in TSO capacity building

- The given title was addressed in slightly different ways in the presentations
- US NRC and IRSN: verbal presentations – reflections on what had been present by VARANS
- CNSC: Organisation, services, experience IRRS mission to Canada and supporting Romanian and Chinese RB/TSO and existing mechanisms to support embarking TSOs
- SEC NRS: Support to Rostechdazor on Assistance in the Regulatory Framework Development of New-Comers, a detailed presentation on Assistance to Counterparts in Developing Their National Nuclear Power Infrastructures: Belarus, Turkey, Jordan, Vietnam, Bangladesh, Egypt
Others: Experience in expert missions and lessons learnt in TSO capacity building (continued)

- GRS: Organisation, services, experience, in particular experiences with China and Turkey
- VTT: Organisation, services, experience related to safety analysis / training simulator code IAEA expert missions and other activities with embarking countries outside the IAEA framework (unspecified cases addressed at general level)
- ENSTTI: Experience in TSO capacity building for embarking countries – a critical review of experiences- reflected in the summary
- JRC: Organisation, means and tools to address the embarking countries
The TSO Forum and the Experts of the Consultancy meeting have revealed:

- Scientific and Technical knowledge and expertise are essential components for global nuclear safety and security.
- Scientific and Technical competences and experiences form the basis for effectively regulating safety.
- Experience shows that TSO must be established early in the development of a nuclear programme.
- Sharing knowledge and expertise (knowhow) is necessary to strengthen/develop/maintain safety.
Process of establishing a TSO

- The establishment of the legal framework that governs the needs for TSO and the regulatory body.
- The establishment and development of TSOs should be addressed at the beginning of the nuclear program.
- At the early phases of NPP program, using commercially international consultants could be a good approach. But technical capacity should be sufficiently addressed as soon as possible:
  - To work and control activities and results of international consultants. If possible, ask for support from advanced TSOs or Regulatory Bodies through bilateral or multi collaboration to involve in reviewing process of results performed by consultants.
  - To regulate the long-term NPP program.
- Examples presented indicated that an early establishment of TSO has not been used in all programmes.
Proposals to be considered

- IRRS Modules but Technical and Scientific competences should be part of the mandatory modules
- Time to be allocated to Technical and Scientific competences
- TECDOC TSO with specific appendix to embarking countries
- Invite embarking countries to participate in the discussion (interest from Kenya,..)
- Promote the TS capacity for embarking countries in the GC60 resolution needs strong support from MS
Other issues

- **It is important to have the mechanisms to financially support the TSO capabilities**
- For embarking countries, the national legislation should consider to have a dedicated mechanism that financially support national infrastructure and qualified staff.
- **Responsibilities of TSOs in the Regulatory System**
- The roles and responsibilities of the TSOs in the Regulatory System should be clearly defined
- **Basic processes for the establishment of TSO taking into account their maturity**
- Information provided should be proportional to required skills and competences and their maturity
Frameworks & networks

- **National framework**
  - Assessment of needed competences and R&D needs should be addressed at national level and involved all relevant stakeholders (the National Safety knowledge platform can provide a comprehensive tool)

- **Regional networks and frameworks**
  - Regional network is very important to identify the issues and benefits from other neighbours (FNRBA, ANSN, ANNuR, EUcAS, ETSON)
  - Accessibility of safety profiles

- **International networks and frameworks**
  - International network ([TSO Forum](#), RCF)
WHAT
What are the needed competences?

- At national level, to regulate activities and facilities, the Regulatory System must possess all relevant competences: for instance at the Regulatory Body, at in-house TSO, at external TSOs and through international networks.
  - An effective mechanism should be in place to get the full participation of external TSOs in the regulatory activities
  - The independence of TSOs’ activities (supporting for the Regulatory Body and Utility) should be significantly addressed
Which tools/training may be used?

- The comprehensive training program should be developed with the involvement of TSOs (gaps on existing specific competence must be identified).

- Establishment of relation with TSOs of advanced nuclear countries plays important role of development and transfer of competences and experiences:
  - For training;
  - For joining group of using computer codes developed by advanced TSOs;
  - For sharing information and experience (evaluating results of the imported design), in particular with TSOs of exporting countries.

- If possible, it is expected to have a partnership between experienced TSOs and TSOs of embarking countries: sharing experience on project management and technical issues (on both safety assessment and inspection).
Summary session 2 – Gap analysis on existing IAEA missions and tools linked to TSO capabilities

chaired by Carla Eibl-Schwaeger GRS Germany
Objectives

- identify the reference to TSO work within the SS
  sort the references under the topics
- check where these topics are addressed within the review missions
- assess the consistency and prioritize to the needs of embarking countries
Key messages

**SSG16:**
- National policy and strategy, Global safety regime and Regulatory framework shall consider and implement the technical expertise either as internal or external TSO (Actions 20, 24, 27)
- More consideration on funding related to E&T (Actions 48, 50)
- More consideration on identification of availability of technical expertise in phase 1 (Actions 61 and 62):
  - National Safety Knowledge Platform could be a tool to support the expertise mapping

**MATRIX for the Regulatory Bodies and TSOs:**
- Interaction at regional level (enhance the cooperation at regional level on subjects related to technical and scientific capacity)
- Add a column dedicated to support by TSO Forum
Key messages

**IRRS mission:**
- Modules 1 to 12 should be mandatory and the tailored made module 13 should also reflect the TSO duties and responsibilities
- To start the pre-IRRS mission in phase 1 to address the TSO issues (sustainable financial support, implementation...)
- To assess how the TSO issues are addressed within the SARIS

**INIR mission (peer review related to implementation of milestones):**
- The Experts of the CS expressed the need to discuss with IAEA/NE how detailed and when in the process, TSO issues are addressed within the INIR mission.
Conclusion of session 2

All the different elements referring to TSO in the various document of IAEA safety standards series should be grouped together (for instance in a summary table).

The Experts proposed to have:

- a working document for embarking countries to develop its Technical and Scientific Capabilities (as a separate document based on the IAEA TECDOC for TSOs)
- The above mentioned summary table could provide necessary guidance for embarking countries.
- Develop a self assessment related to the specificities of Technical and Scientific Capabilities to be included in the existing self assessment procedures.
Summary session 2 – Capacity Building

chaired by Didier Louvat ENSTTI European Union
Key messages of session 3

- As the expertise in assessment needed to support the Regulatory decision is more matter of skills and competences than just knowledge,

- Thus, it can be only transferred by technically and scientific entities. This is valid of all field of radiation safety and nuclear safety. In particular, IAEA review services should be organized to cover the whole spectrum of competences needed/used by the Regulatory Body.

- As the IAEA is re-thinking its review services in E&T to cover the entirety of Capacity Building, the reference to Technical and Scientific Capabilities in supporting Regulatory decisions is evident and needs to be integrated during this process.

- During the preparatory missions of existing review services, it would be important to highlight TSO functions in capacity building => a standard presentation as a roadmap to develop TSC has to be developed and should be also part of the preparatory mission ETrEs-EDuTA.

- => in the TECDOC stressed the point of skills and transfer of knowhow
Conclusion of session 3

- To organize a workshop on building Technical and Scientific Capabilities for embarking countries based on the TECDOC for TSOs.
- To develop a workshop syllabus which will address TSO issues in a comprehensive way and tailored to the direct benefit by embarking countries.
- This workshop should gather participants from embarking countries having the same interest and concerns.
- The workshop should be organized with a major contribution from the TSO Forum. => material should be developed
- Depending on the results of the workshop, it can be extended at national level.
- Technical Meeting before or after the workshop or to be merged with the formal Steering Committee, to be decided by end of August
- 1 dedicated day for the preparation of the workshop during the Steering committee October 27-28, 2016 possibility in Karlsruhe or possibility on the margin of Eurosafe Munich 9-11 Nov.
- To develop a dedicated presentation on the TSO Forum initiatives for embarking countries for the GC60 and during Eurosafe in Munich, the new factsheet should reflect this initiative.
Summary session 4 – Recommendations for further steps

Chaired by Brian Thomas US-NRC USA and Terry Jamieson CNSC Canada
Key Messages

The TSO Forum and the Experts of the Consultancy meeting have revealed:

- Scientific and Technical knowledge and expertise are essential components for global nuclear safety and security
- Scientific and Technical competences and experiences form the basis for effectively regulating safety
- Experience shows that TSO must be established early in the development of a nuclear programme (basic processes for the establishment of a TSO taking into account the maturity and the roles and responsibilities of the TSOs should be clearly defined)
- Sharing knowledge and expertise (knowhow) is necessary to strengthen/develop/maintain safety
- A quick review/gap analysis of IAEA requirements and guidance documents (i.e. SSG-16, GSR PART 1) revealed more emphasis is required to assess (1) technical and scientific capability needs; (2) identification of the financial mechanisms at the start of development of a national nuclear programme (during Phase 1) and (3) that there was no module in the existing reviews dedicated to the evaluation of technical and scientific support capabilities, nor any working documents for embarking countries describing how to establish this capability based on the TSO Tecdoc
Guidance needs to provided for embarking countries to establish a technical and scientific support capability.

- As the expertise in assessment needed to support the Regulatory decision is more matter of skills and competences than just knowledge, thus, it can be only transferred by technically and scientific entities. This is valid of all field of radiation safety and nuclear safety. In particular, IAEA review services should be organized to cover the whole spectrum of competences needed/used by the Regulatory Body.
- As the IAEA is re-thinking its review services in E&T to cover the entirety of Capacity Building, the reference to Technical and Scientific Capabilities in supporting Regulatory decisions is evident and needs to be integrated during this process.
- During the preparatory missions of existing review services, it would be important to highlight TSO functions in capacity building => a standard presentation as a roadmap to develop TSC has to be developed and should be also part of the preparatory mission ETReS-EDuTA.
Recommendations for Further Steps

1. Technical and Scientific competences should be part of the mandatory modules of IRRS (and INIR?), and could be included in SARIS.

2. Develop a working document (compilation of existing requirements in safety guides, etc) for embarking countries (possibly to be included in a future version of the TSO Tecdoc).

3. Invite embarking countries to participate in the discussion (interest from Kenya,...) in the TSOF and the working groups.

4. Promote the TS capacity for embarking countries in the GC60 resolution needs strong support from MS.

5. To organize a workshop on building Technical and Scientific Capabilities for embarking countries based on the TECDOC for TSOs.

6. To develop a workshop syllabus which will address TSO issues in a comprehensive way and tailored to the direct benefit by embarking countries.

7. This workshop should gather participants from embarking countries having the same interest and concerns.

8. The workshop should be organized with a major contribution from the TSO Forum. => material should be developed.

9. Depending on the results of the workshop, it can be extended at national level.

10. Technical Meeting before or after the workshop or to be merged with the formal Steering Committee, to be decided by end of August.

11. 1 dedicated day for the preparation of the workshop during the Steering committee October 27-28, 2016 possibility in Karlsruhe or possibility on the margin of Eurosafef Munich 9-11 Nov.

12. To develop a dedicated presentation on the TSO Forum initiatives for embarking countries for the GC60 and during Eurosafef in Munich, the new factsheet should reflect this initiative.
Thank you for your attention....