Technical and Scientific Support Organization (TSO) Forum – Supporting the Development of Technical and Scientific Capacities in Member States

International Conference on Effective Nuclear and Radiation Regulatory Systems
The Hague, Netherlands
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DG DSM
Canadian Nuclear Safety Commission
1. Background
Challenges, TSOs supporting regulatory functions, TSO conferences, TSO Forum, IAEA TECDOC-1835

2. TSO Initiative
Supporting Member States in their TSO related strategies
- TECDOC-1835, SSG-16, IAEA
References

Experience feedback

TSO Development Steps

Cases studies

TSO Self-Assessment

National Workshop

3. Way ahead
- National Workshop on developing and strengthening technical and scientific capacity
  25-29 Nov 2019, South Africa
1. Background - The IAEA TSO Conferences & TSOF

- 2007: 1st TSO Conference:
  ✓ develop a common understanding of the TSOs challenges

- 2010: 2nd TSO Conference:
  ✓ Regulatory functions need to be science based.
  ✓ Need of a platform for networking => Creation of TSO Forum

- 2011: Fukushima Daiichi NPS Accident:
  ✓ The “need for appropriate technical and scientific support” for strengthening the effectiveness of national regulatory bodies

- 2014: 3rd TSO Conference:
  ✓ Technical and Scientific function is a critical component of the regulatory system. => Development of a TECDOC
  ✓ MSs should have the possibility to evaluate the capabilities of their national technical scientific support function either in the IRRS mission or in another way to be identified (e.g. dedicated TSO missions). TSOF could contribute to the building of TSO capabilities of newcomer countries. => TSO Initiative

- 2018: 4th TSO Conference (220 participants from 54 Member States):
  ✓ Encourage the TSO Initiative further progress in advisory services, field test of self-assessment and national workshop => Promotion of TSO Initiative

TSO Forum website https://gnssn.iaea.org/main/tsof/Pages/default.aspx
1. Background - The IAEA TSOF members

- Encourage open dialogue and sharing of scientific and technical information
- Promote coordination and collaboration to contribute to the worldwide harmonization of TSO practices

<table>
<thead>
<tr>
<th>Members</th>
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<tbody>
<tr>
<td>Regulatory Bodies, TSOs and members from:</td>
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<tr>
<td>Belgium</td>
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<tr>
<td>Canada</td>
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<tr>
<td>China</td>
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<tr>
<td>Czech Republic</td>
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<td>EC/Joint Research Centre</td>
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<tr>
<td>Finland</td>
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<td>France</td>
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<td>Germany</td>
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<td>Italy</td>
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<td>Japan</td>
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<td>Republic of Korea</td>
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<td>Lithuania</td>
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<td>Poland</td>
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<td>Russian Federation</td>
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<td>South Africa</td>
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<td>UK</td>
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<td>Ukraine</td>
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<td>USA</td>
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- Chair: Mr Brian Thomas (NRC)
- Vice-Chair: Ms Carla Eibl-Schwaeger (GRS)
- IAEA technical secretariat: Mr Lingquan Guo (NSOC/NSS) Mr Sameer Kunjeer (NSOC/NSS)

- Partners: European Technical Safety Organisation Network (ETSON) European Nuclear Safety Training and Tutoring Institute (ENSTTI)
2. TSO Initiative - IAEA TECDOC-1835

“A Technical and Scientific Support Organization (TSO) is an organization or organizational unit designated, or otherwise recognized by a regulatory body and/or a government, to provide expertise and services to support nuclear and radiation safety and all related scientific and technical issues, to the regulatory body.” (definition in TECDOC-1835)

TSO activities may also include support to nuclear security and safeguards.

References:
- IAEA Safety Standards Series No. GSR Part 2 Leadership and Management for Safety
- IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources
- IAEA Safety Standards Series No. SSG-16 Establishing the Safety Infrastructure for a Nuclear Power Programme
- IAEA-TECDOC-1734 “Establishing a National Nuclear Security Support Centre”
- IAEA Nuclear Energy Series No. NP-T-3.28 Technical Support to Nuclear Power Plants and Programmes
2. TSO Initiative - IAEA TECDOC-1835

Different models in regulatory framework
Internal unit, External organization, TSO working for both sides

Common characteristics and core values
Safety Culture, Independence, Transparency, Conflict of interest, etc.

Key components of the expertise
Safety Review, Inspection
Development of Safety Documents for Legislation & Regulation,
Research & Development, E&T, etc.

Scope of activities
Support to the RB, etc.
2. TSO Initiative - SAQ Tool: Introduction

**Background**
- A tool designed to **support sustainable national TSO capability**, while the IAEA providing assistance to ensure capacity building needed for development of national nuclear programme

**Target**
- A TSO as independent entity or being part of regulatory body
- Also, an organization providing partial technical support within the nuclear regulatory framework

**Goal**
- Help to evaluate the **level of maturity** of any TSOs
- Applied at **any stage of development** of national nuclear programme
- Used to facilitate establishment, development or continuous improvement of TSO capabilities

**Results**
- **EXCEL format** designed to be **user friendly**
- Visually represented in a **spider chart diagram** from the evaluation of the scale for each item
- Upon feedback from a pilot applications, will be refined and **webcasted for free application**

SAQ: Self-Assessment Questionnaire
2. TSO Initiative - SAQ Tool : Structure

Guidance
- TECDOC-1835
- TSO Development Process
- TSO Case Study Library
- Other IAEA DOCS (SSG-16, ...)

Analytical Pillars
- TSO Development Process
- National Priority

Self Evaluation

User Manual

Report & SWOT Analysis

National Action Plan

National Workshop ToR
2. TSO Initiative - SAQ Tool: Analytical Pillars

<table>
<thead>
<tr>
<th>Pillar Nr.</th>
<th>Key topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Role, Characteristics and Management</td>
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<tr>
<td>2</td>
<td>Capacity Building and Outreach</td>
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<td>3</td>
<td>Safety Assessment and Inspection</td>
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<td>4</td>
<td>Support to the Development of Regulatory Documents</td>
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<tr>
<td>5</td>
<td>Dose and Environmental Assessment and Surveillance</td>
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<td>6</td>
<td>Assessment of Operating Experience</td>
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<tr>
<td>7</td>
<td>Emergency Preparedness and Response</td>
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<tr>
<td>8</td>
<td>Research and Development</td>
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</tbody>
</table>
2. TSO Initiative - SAQ Tool: Implementation

1. Scope Setting
   - Selection of relevant topics from the menu of eight pillars of management issues and technical issues
   - Setting expectation levels regarding the TSO Development Steps
   - Setting National Priority Co-efficients for the chosen topics

2. Self-Evaluation
   - Assessing topics within the relevant pillars with the help of the supporting questionnaire and other IAEA documents (TECDOC-1835, CASE STUDIES, SSG-16, ...)
   - Automatic generation of results via analysis tool (a spider chart diagram)
   - Results are displayed in different ways and comparable with the benchmark.

3. Self-Assessment Report and National Action Plan:
   - Preparing the self-assessment report, identifying key strengths weakness, opportunities and threats (SWOT analysis)
   - Providing support, as needed, through National Workshops with IAEA experts
   - Preparing National Action Plan to further implement the National TSO development strategy
## TSO Initiative - SAQ Tool: Questionnaire (example)

<table>
<thead>
<tr>
<th>#</th>
<th>Question</th>
<th>Guidance</th>
<th>TECDOC-1955</th>
<th>IAEA Req.</th>
<th>Rating</th>
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<tbody>
<tr>
<td>1</td>
<td>Process oriented questions:</td>
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<tr>
<td></td>
<td>A. Pillar 1. Role, Characteristics and Management - General</td>
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<td></td>
<td>3.1.2.1</td>
<td>Guidance</td>
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<td>3.2.2</td>
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<td>3.3.3</td>
<td>Guidance</td>
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<td></td>
<td>B. Pillar 1. Role, Characteristics and Management - Topic (in-depth analysis)</td>
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<td>3.5</td>
<td>Guidance</td>
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<td>3.6.1</td>
<td>Guidance</td>
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<td></td>
<td>Performance oriented questions: aggregation from 6 technical pillars</td>
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<td>3.35</td>
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</tbody>
</table>

To pillar results & graphs: Download xlsx file

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2. TSO Initiative - SAQ Tool: Results generation

A. General (Broad Analysis) - Process and Performance

1. Role, Characteristics and Management
2. Capacity Building and Outreach
3. Safety Assessment and Inspection
4. Support to the Development of Regulatory Documents
5. Dose and Environmental Assessment and Surveillance
6. Assessment of Operating Experience
7. Emergency Preparedness and Response
8. Research and Development

General

- Process
- Performance

- Process
- Performance
2. TSO Initiative - SAQ Tool: Results generation (ideal case against reality)

C. General (Broad Analysis) - TSO and Benchmark

<table>
<thead>
<tr>
<th>Category</th>
<th>TSO</th>
<th>Benchmark</th>
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<tbody>
<tr>
<td>1. Role, Characteristics and Management</td>
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<tr>
<td>8. Research and Development</td>
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</tbody>
</table>

Diagram:
- 1. Role, Characteristics and Management
- 2. Capacity Building and Outreach
- 3. Safety Assessment and Inspection
- 4. Support to the Development of Regulatory Documents
- 5. Dose and Environmental Assessment and Surveillance
- 6. Assessment of Operating Experience
- 7. Emergency Preparedness and Response
- 8. Research and Development

Legend:
- Green line: TSO
- Brown line: Benchmark
2. TSO Initiative - Case study template

• A case study « tells a story » of what happened in reality in a given country
  – Describes the evolution of TSO establishment with contexts and actions taken over a given period of time
  – Touches on roles of key actors
  – Describes processes engaged such as national circumstances and constraints, and not just the results
  – Simplified to avoid unnecessary details

• Because;
  – TSO operations differ from country to country, no model, only organizational examples
  – INIR/IRRS services provide « snapshots » and analysis of the existing regulatory order, however do not provide answers for strategic evolutions of the TSO

• Therefore;
  – Provide template of the Case Study, useable for each given country
Objectives

The TSO initiative aims to help the IAEA and the Member States in developing national TSO capability supporting the Regulatory Functions, based on a strategic vision of their capacity build-up and with the goal of achieving sustainability.

Targeted Member States

While the development and maintenance of technical and scientific support infrastructure is a priority for all member states, this initiative is specifically targeted at the following countries:

- Embarking countries;
- Countries which are in the process of expanding their nuclear programme;
- Countries which are in the process of developing a sustainable regulatory system including scientific and technical support functions;
- Countries which are in the process of assessing the proficiency and sustainability of their existing scientific and technical supporting infrastructure.
2. TSO Initiative - National workshop

- National workshops will be implemented upon request.
- The format of the workshop and participation will be adjusted considering the specificity of the request.
- Participants share their specific national concerns.
- National workshops appeared to be an appropriate tool to improve strategies and optimise efforts and also to raise awareness at different levels.
- Potential candidates could be:
  - South Africa (already planned)
  - Belarus
  - Bangladesh
### 3. Way ahead

<table>
<thead>
<tr>
<th>Task</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>National Workshop on developing and strengthening technical and scientific capacity.</td>
<td>25-29 Nov 2019</td>
</tr>
<tr>
<td>Report on results/outcomes of the National Workshop in South Africa to the 15&lt;sup&gt;th&lt;/sup&gt; TSOF Steering Committee meeting</td>
<td>Dec 2019</td>
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<tr>
<td>Finalization of timeline strategy guidance</td>
<td>March 2020</td>
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Final Thoughts

✓ Some national TSO capacity and capability is necessary (although structure and domestic/international contributions may differ)
✓ IAEA missions to embarking countries have highlighted the need for regulators to build and subsequently maintain strong technical capacity
✓ IAEA-TSOF working with established and emerging TSOs to develop tools to allow TSOs to self-assess their capacities and seek continuous improvement. National workshops also important for validating TSO Initiative tools and encouraging participation in the TSOF.
✓ Regulatory body support key to common shared goal of effective TSO competency and capacity around the world
Thank you for your attention

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