

Explanatory Meeting on the Methodology for Technical and Scientific Support Organizations Self Capability Assessment

3.3 Development and application of the TSO Self Capability Assessment (TOSCA Methodology)

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IAEA TSO Forum to support mainly newly developing countries to build up a TSO (TOSCA)



Technical and Scientific Support Organizations Self Capability Assessment (TOSCA)

A new innovative web-based tool for the self-assessment of capabilities of Technical and Scientific Support Organizations (TSOs) supporting national regulatory bodies

What is the TSOF ?

The Technical Support Organizations Forum (TSOF), established in 2010 by the IAEA, promotes collaboration among TSOs and other organizations interested in technical and scientific issues related to nuclear safety and security.

TSOF is open to TSOs and expert groups nominated by IAEA Member States. Representatives of the European Commission, the Organization for Economic Co-operation and Development Nuclear Energy Agency (OECD NEA) and regional TSO networks participate as observers. A TSOF Steering Committee facilitates and oversees the implementation of the forum's programme.

What does TSOF Forum offer?

This forum offers a platform to develop common approaches to build and maintain a high level of safety in line with the IAEA Safety Standards (www.iaea.org/resources/safety-standards). It is an initiative to help Member States develop and strengthen their technical and scientific capabilities, based on an IAEA TECDOC 1835 developed with the support of the Forum.

Regulatory functions require support by scientific and technical expertise.

The support provided by the TSOs can facilitate development and/or provision of regulations and guides, notification and authorization, licensing procedures, regulatory review and assessment, regulatory inspection, enforcement, emergency preparedness and response and communication as well as opportunities to engage in consultation with interested parties.

There is no 'one size fits all' standard model for a technical and scientific support organization.

In this context, TECDOC-1835 defines core notions and values, to help countries to evaluate their current and future needs for technical and scientific support to cover the safety and security of the whole life cycle of their national nuclear facilities. This publication also provides some illustrative national examples on how to develop and enhance TSO capabilities. It also highlights that the organization and



resourcing of technical and scientific support is a responsibility of each country and should be in line with regulatory processes to achieve technical competence, sustainability as well as independence.

What is TOSCA?

The IAEA TSO Forum, based on recommendations of the International TSO Conferences, identified a need to further support countries in the self-assessment of their technical and scientific support capabilities. In response, a new self-assessment methodology and corresponding web-based IT tool was developed, called TOSCA.

The TOSCA tool is user-friendly and allows all stakeholders (government bodies, regulatory authorities, technical support providers including those embedded in regulatory bodies) to be included in the self-assessment process. TOSCA provides visual displays to synthesize the results of the self-assessment and support analysis (Fig. 1).

Implementation

The TOSCA implementation roadmap covers the following main steps (Fig. 2):

- Select from the broad list of topics covered in TECDOC 1835 and corresponding details of the relevant general safety requirements (GSR), the fields of technical support expertise which a country needs for assessment;
- Define the targets and expectations against which current technical support capabilities will be benchmarked;
- Assess these capabilities in terms of organization and processes, and in terms of performance of the support actually provided;
- Elaborate the main conclusions drawn from the self-assessment, and present them at a national TSO workshop;
- Develop an action plan to further enhance national technical and scientific support



Fig. 1: Display of results

capabilities and ensure their sustainability, in line with current and future national regulatory needs.

Upon request from Member States, the IAEA will provide relevant support to conduct the self-assessment exercise (Fig. 3). This includes a preliminary mission of IAEA experts to the country, followed by a national TSO workshop, which includes all key stakeholders to work and develop a national TSO action plan for developing, enhancing and sustaining technical and scientific capabilities supporting regulatory functions.



Fig. 3: Self Assessment Exercise

Interested in the TOSCA approach and self-assessment tool?

TSOF.Contact-Point@iaea.org
Visit: <https://gnssn.iaea.org/main/tsof>

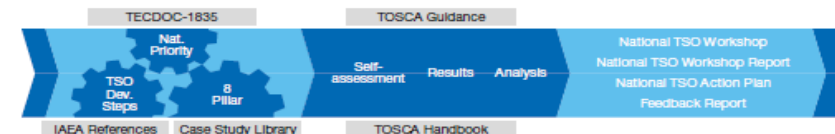


Fig. 2: Roadmap

2. TSO initiative – TSO self-assessment

- Objective to assess the Scientific & Technical capabilities of a TSO :
 - What are the Scientific & Technical capabilities of the TSO?
 - How are they developed, managed and sustained?
 - How are they applied in regulatory functions?
 - To be used as self-assessment tool, in workshops among MS, or in connection with peer reviews
 - For embarking countries or countries with already established capabilities
- Key considerations in the development of the questionnaire
 - Based on the IAEA-TECDOC-1835
 - Emphasis on evaluation of how the TSO is performing its duties

2. TSO initiative – TSO self-assessment

1. Scope Setting

- Selection of relevant topics within the **Technical & Managerial 8 pillar menu**
- Setting of expectations levels in regard to the **TSO Development Steps**
- Setting **National Priority** Co-efficients for the chosen topics

2. Self-evaluation

- **Broad and/or In-depth** Analysis, Phase A and Phase B
- Assessing topics within relevant pillar with the help of the **TOSCA** questionnaire and relevant **IAEA documents** (TECDOC 1835, CASE STUDIES, SSG-16, ...)
- Automatic generation of results via analysis tool (**spider web-chart**)
- Results are displayed in different ways and also compared via **benchmarking**.

3. Self-assessment report and National Action Plan:

- Preparing the self-assessment report, identifying key strengths and areas for improvement, opportunities and threats (SWOT analysis)
- Providing support, as needed, through **National Workshops** with IAEA experts.
- Preparing a **National Action Plan** to further implement the National TSO development strategy.

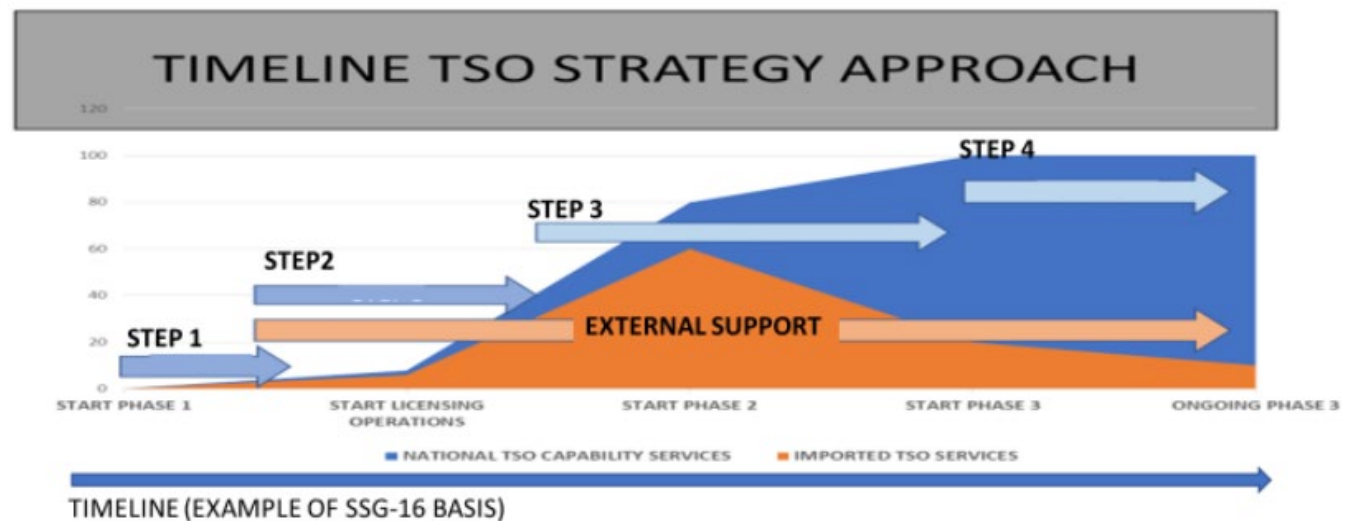
Why TOSCA Methodology ?

Definition of Methodology

1. a system of methods used in a particular area of study or activity.
 - ✓ all around nuclear + radiation safety + security
2. "a methodology for investigating the concept of focal points (FP)"
 - ✓ technical FP and interested parties

Re-thinking of the TSO system in various contextes (1/2)

- **New technical topics:** NPP license extension, development of medical applications (nuclear medicine, advanced radiotherapy units, CT Scan development);
- in the context of legislative or regulatory framework evolutions or *political* decision, such as in the field of radioactive waste management, or decommissioning of nuclear facilities (**national priorities**);
- along the road map towards NPP operations for embarking countries (miles stones approach **development steps**) ;



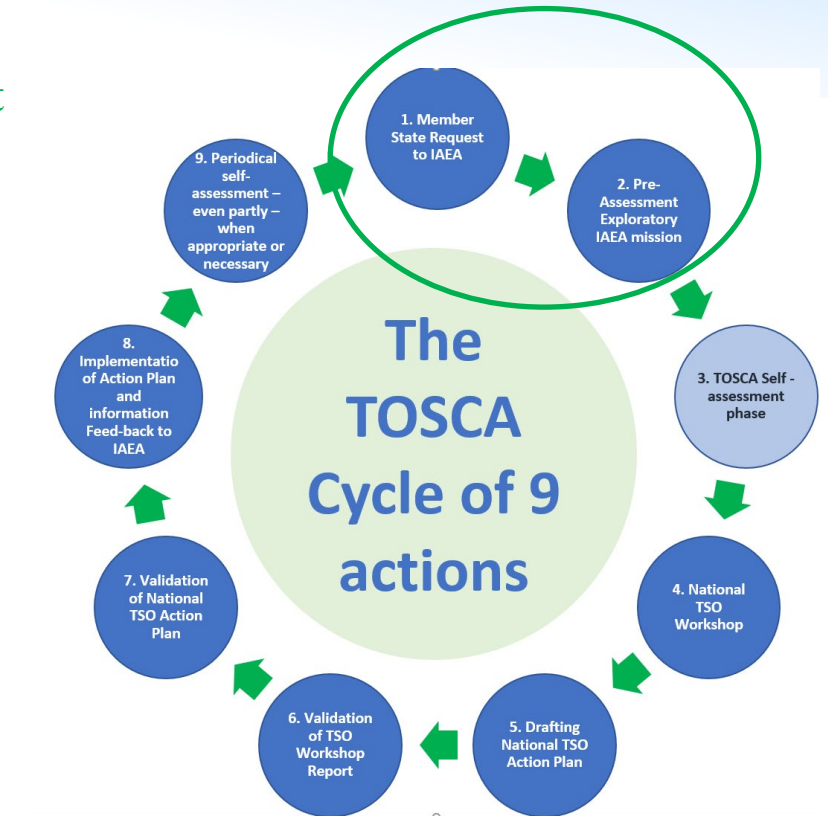
Re-thinking of the regulatory system in various contextes (2/2)



- **Remarkable events with international impacts:** Post-Fukushima-Daichi NPP accident, COVID-19 pandemic, safety in time of war with the resulting major disruption of international relations could induce a critical review of technical support processes reliant on foreign expertise;
- **Topics:** SMRs/Advanced reactors/fuel and new technologies and approaches (including artificial intelligence), Long Term Operation, Human and Organizational Factors, Climate change ;
- **Concerns** in society about risks induced by nuclear operations due to the growing use of internet and social networks;
- **Other challenges:** human (retirement, attractiveness) & funding resources.

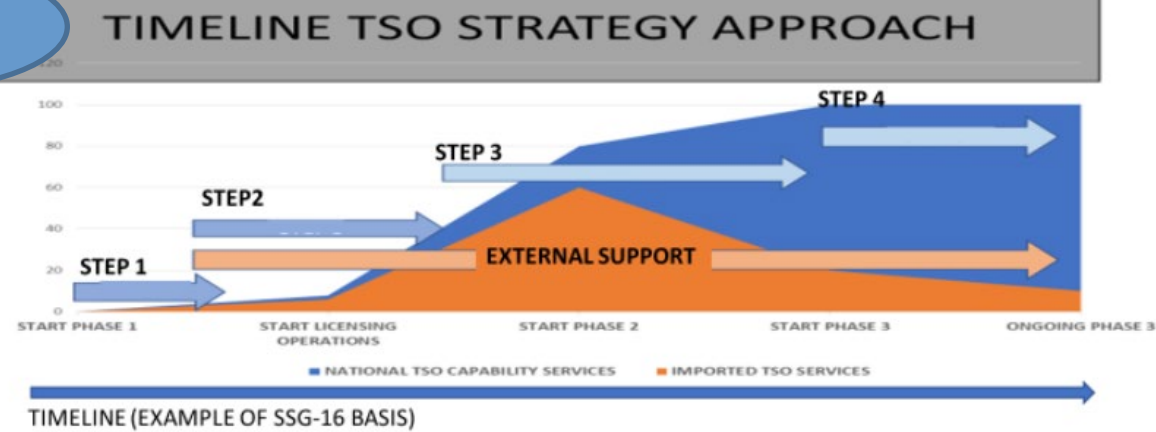
From TOSCA to the National Assessment Workshop and National Action Plan

- 1 Member State request to the IAEA for a TOSCA self-assessment
- 2 Pre-assessment exploratory IAEA mission and preparation of self-assessment
- 3 Self-assessment phase, with the support of the TOSCA Tool
- 4 National TSO Workshop, organized jointly by the Member State and the IAEA, with contribution of IAEA TSOE Experts
- 5 Drafting of the National TSO Workshop Report and elaboration (or update) of a draft National Technical Support Development Action Plan
- 6 Validation of Workshop Report by competent national authorities and by IAEA
- 7 Finalization, and validation of National Action Plan by competent national authorities after consultation of IAEA TSOE Experts
- 8 Implementation of the Action Plan, and information feed-back to IAEA TSOE on implementation results
- 9 Periodical Self-Assessment – even partly – when appropriate or necessary



TOSCA Methodology

WHEN?



Case Study Library

You will find a list of TSO case studies of member states illustrating key TSO development and operational problematics.

WHY?

Establishment of
NNR TSO Case
Study_June 2020

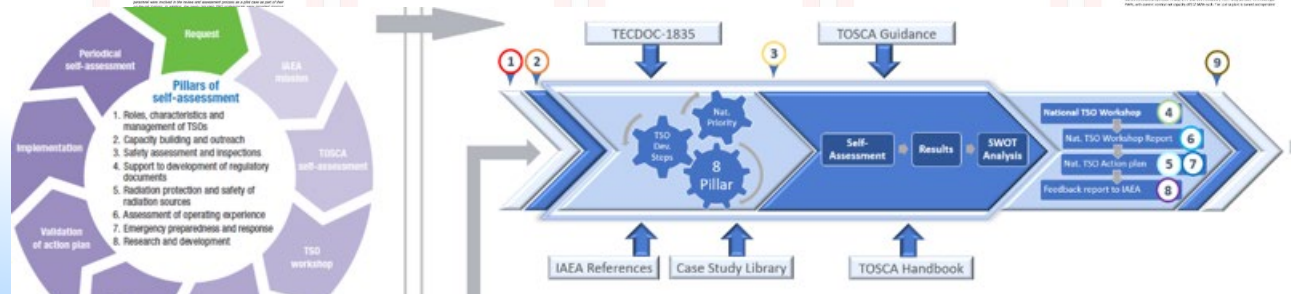
IRSN France TSO
Case study on
Research_Jan 2023

TSO Case Study
(final)_PNRA-
Pakistan

VTT Finland_TSO
Case
study_Research
Programmes

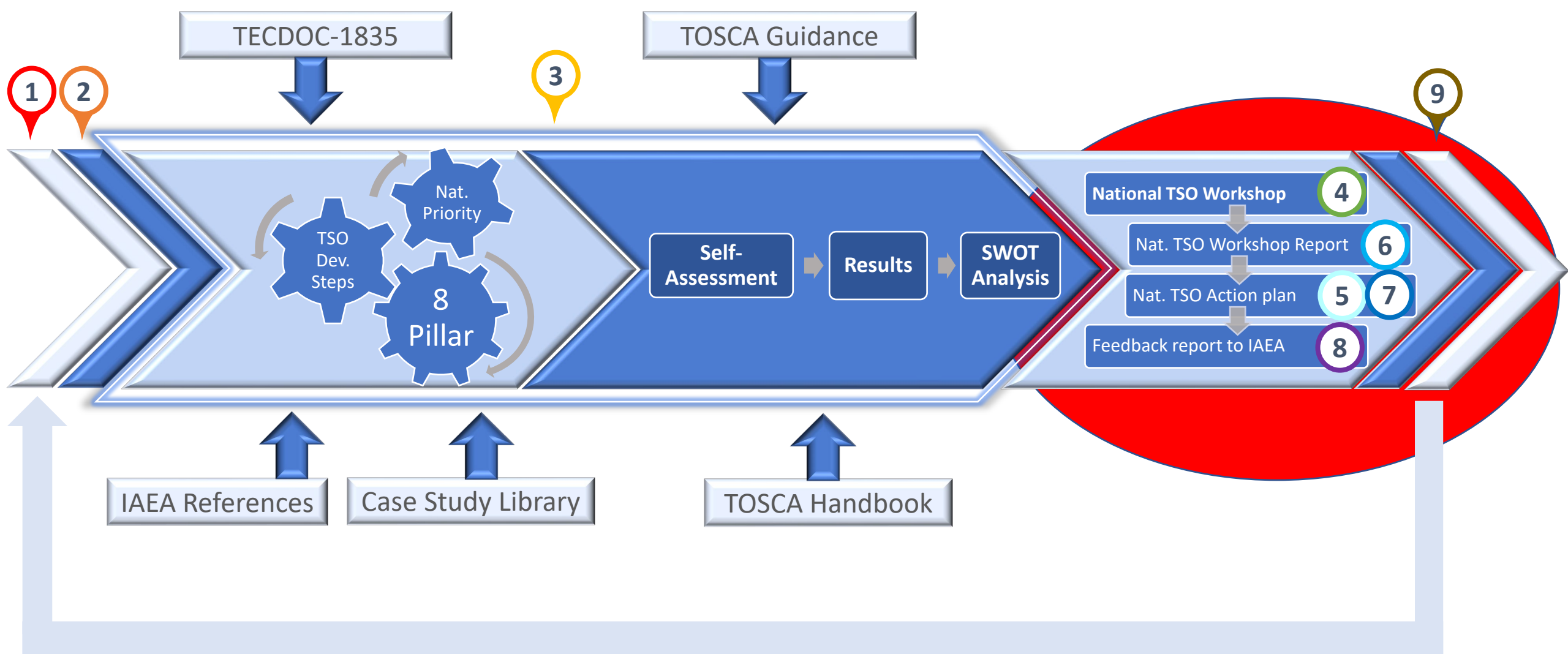
WHAT?

HOW?



WHO?





- | | | |
|---|-------------------------------------|--|
| 1 Member State Request to IAEA | 4 National TSO Workshop | 7 Validation of National TSO Action Plan |
| 2 Pre-Assessment Exploratory IAEA mission | 5 Drafting National TSO Action Plan | 8 Implementation of Action Plan and Feedback Report to IAEA |
| 3 TOSCA Self -assessment phase | 6 Validation of TSO Workshop Report | 9 Periodical self-assessment – when appropriate or necessary |

TOSCA

IAEA Methodology for Technical and Scientific Organisations and Organisational Units (TSOs) Self Capability Assessment

[Page Help](#) [carlaclaudia.es@gmail.com](#) 



8 PILLARS

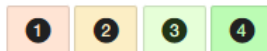
The questionnaire under the process and performance-oriented aspects are grouped into 8 chapters, represented as PILLAR.

Role, Characteristics and Management

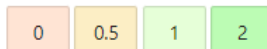
Pillar 1

The characteristics and management of technical and scientific support are the conditions for its effectiveness and efficiency for the regulatory functions.

Development Step:



National Priority:

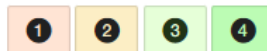


Capacity Building and Outreach

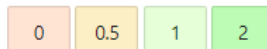
Pillar 2

The development and maintaining of technical knowledge, expertise and capability is a key supporting process for an effective TSO.

Development Step:



National Priority:

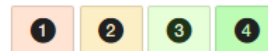


Support to Safety Assessment and Inspection

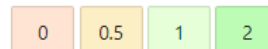
Pillar 3

Safety assessment review and inspection are performed to support the regulatory body in determining whether facilities and activities comply with regulatory obligations and conditions.

Development Step:



National Priority:

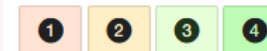


Support to the Development of Regulatory Documents

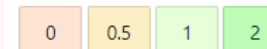
Pillar 4

The TSO supports the regulatory body by contributing to the process of updating and development of documents for guidance, rules, and regulations.

Development Step:



National Priority:



Radiation protection and Safety of Radioactive sources

Pillar 5

The TSO contribution to radiation protection and safety as well as to environmental monitoring, assessment and surveillance is key issue for protecting people and the environment.

Assessment of Operating Experience

Pillar 6

The TSO supports the regulatory body to investigate and disseminate information on operating experience to use this in their management, safety assessment and engineering practices.

Emergency Preparedness and Response

Pillar 7

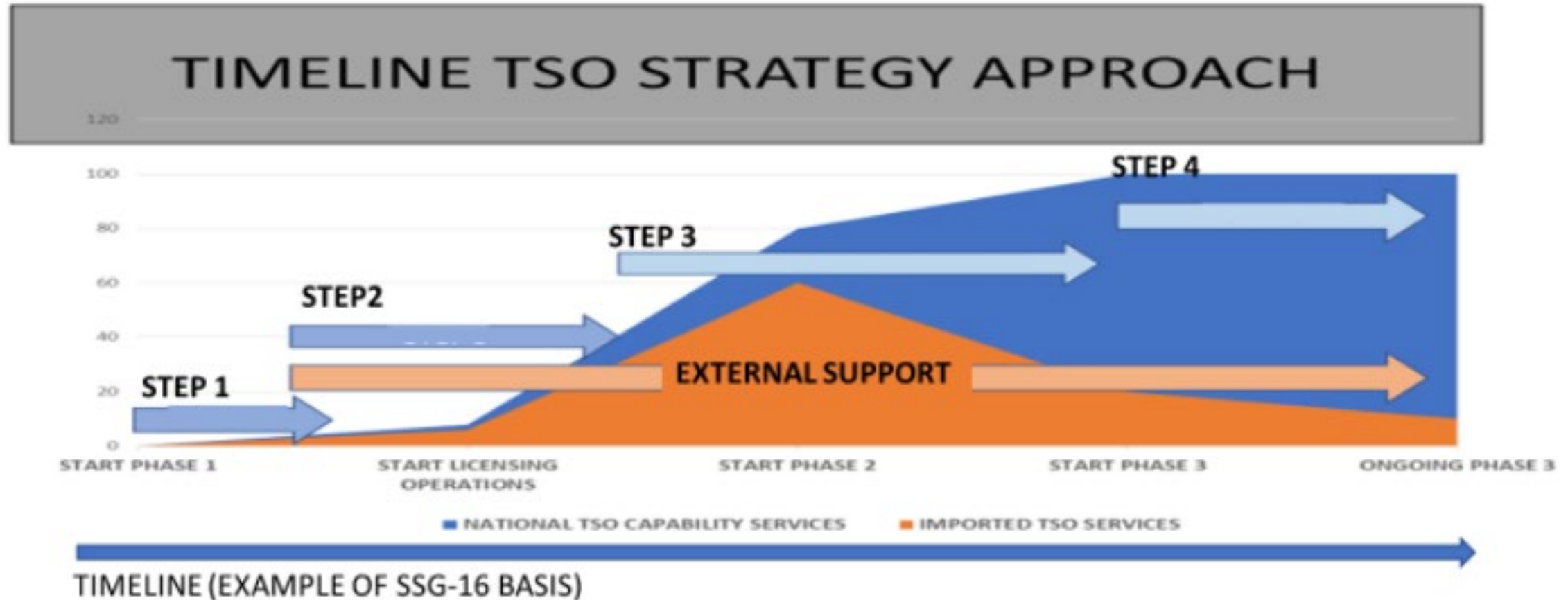
The TSO supports the regulatory body together with the response organizations and the operating organisations in emergency preparedness and response.

Research and Development

Pillar 8

Research and development support of the TSO is to independently assess and review the adequacy of the technical basis for safety regulation.

Development Steps - Timeline



TSO Development Steps and Actions

The DEVELOPMENT STEPS with the necessary ACTIONS taken consider the different levels of development of a TSO capability for a newly started organisation and for a more mature given to specific areas of technical and scientific competencies.

Step 1: Regulatory TSO national capability on agenda for nuclear safety infrastructure

6 Actions:

1. Review of RB technical support needs, taking into account IAEA requirements & recommendations, and national nuclear development & safety policy
 1. Operational support needs (pillar areas 3 to 8)
 2. RB sustainability support needs (training services, maintaining regulatory documentation, international cooperation on scientific themes,...)
 3. Broad options for TSO capability organisation in relation to RB
2. Review of existing or potential sources of technical support (national & foreign), and of their respective advantages and inconvenients in short and longer terms
3. A first national TSO workshop, in cooperation with iaea, with participation of key stakeholders
4. Drawing up national policy recommendation for planning a national tso capability, considering workshop conclusions
5. Seek RB & government approval of recommendation, and provision of resources for a tso planning project
6. Formal launch of tso blue print planning project (project T.O.R, project leader , time frame, ...)

TSO Development Steps and Actions – Role, Characteristics and Management

Step 2: A blueprint for national TSO capability (TOSCA Pillar 1)

10 Actions:

draft documents describing with enough detail to enable operational implementation of the tso capability development, taking into account iaea requirements and guidance, as well as benchmarks with comparable countries tso problematic. TSO functions (scope of operational support to rb, technical capacity sustainability, training services, international cooperation, R&D)

1. TSO statutory organisation in relation to RB & other relevant institutions
2. TSO governance
3. TSO operational links to rb: workflow principles for technical support functions, related qa process
4. TSO funding and staffing principles (including future career opportunities in RB & TSO)
5. Requirements for tso infrastructure and technical assets
6. TSO internal management system, qa, safety culture and related values
7. Developing appropriate communication with key stakeholders (RB staff, GOV departments, scientific institutions, industry, ...) to build up understanding of and adhesion to the national TSO capability project
8. Seminars & one to one communication with key deciders
9. Consultation on draft documents
10. Project presentation brochure, ...

TSO Development Steps and Actions – Capacity Building and Outreach

Step 2: A blueprint for national TSO capability (TOSCA Pillar 2)

1.4 Actions: Draft documents describing with enough detail to enable operational start up of the tso activities
Identification of key technical cooperation partners (national & international, including foreign support service providers) to contribute to tso skills & infrastructure development, and preparation of contracts

2.Initial recruitment strategy (including from rb staff)

3.Proposed qa based process for acquisition, assessment and validation of tso expertise competencies (eg safety file assessment), on the basis of iaea 4 quadrant approach: blank tests, peer reviews, validation by international partners, ...

4.Development policy for tso technical training services (for future internal and rb needs)

Note: plans should take into account operational support services and knowledge transfer which may be provided through procurement and/or vendor country's tso

TSO Development Steps and Actions – Technical Areas

Step 2: A blueprint for national TSO capability (TOSCA Pillar 3 to 8 as Required)

1.3 Actions:

Quantification (person/year) of support tasks to be performed in the first 3 to 5 year period, for each pillar area

1. Operational tasks: eg safety file assessment, rb staff training modules
2. Development & management tasks: tso competency build up, qa system operation, technical resource maintenance, including regulatory documentation, networking with peer bodies -and vendor tso for embarking countries -, R&D initiation)

2. Quantification of human and other resources needed to enable operational start up of tso

1. Per pillar, with a development plan over 3 to 5 years
2. Taking into account initial sustainability requirements: at least 2 experts per field of technical skills

3. Description of operational interface processes with rb (and other institutions as required, eg for epr or r-d fields)

Note: plans should take into account operational support services and knowledge transfer which may be provided through procurement and/or vendor country's tso in the case of embarking countries

TSO Development Steps and Actions

Step 2 **FINALISATION**: Blueprint validation

1.6 Actions:

Preparation of a summary report presenting the TSO Blueprint, and associated requirements (HR, other, budget) for 3 to 5 year initial period.

2.Prepare a check list of all key actions needed for TSO start up, with allocation of responsibilities, time frame, and risk mitigation measures.

3.TSO Planning TOSCA Self-Assessment with IARA questionnaire.

4.Review of TOSCA Self-Assessment results, with participation of key stakeholders (National Workshop.)

5.Adjustment of planning & checklist, with IAEA support if required.

6.Formal validation by relevant national authorities (RB, Government level).

TSO Development Steps and Actions

Step 3: Initiate TSO operations

- 1.6 Actions: Formally set up the planned TSO structure, through appropriate decision process and formal approval of documents, in line with checklist of actions
2. Provide initial staffing and other required resources
3. Set up tso management, workflow procedures & QA system
4. Ensure development of safety culture leadership skills
5. Set up cooperation agreements with peer bodies & key partners
6. Assess progress after 1, 2 and 5 years through IAEA selfassessment questionnaire and IAEA review services

TSO Development Steps and Actions

Step 4: National TSO sustainability

1.5 Actions: Review of tso sustainability issues after 3 to 5 years of national tso operations, using IAEA tso self assessment tool

1. Degree of fulfilment of TSO missions, considering available budget & resources
 2. Customer feed back (trust, safety culture, quality, timeliness, costs) & other qa feed back
 3. TSO staff satisfaction & turnover statistics
 4. Cooperation with partner institutions, including external (foreign) support services providers
 5. Impact of TSO capability development on overall RB effectiveness and image
2. National workshop gathering key stakeholders, with IAEA support
1. Improving existing TSO services
 2. Adjusting national TSO capability as well as procured support to meet anticipated RB needs
3. Report on required improvements & changes, with national action plan
4. Implementing national action plan with qa periodic follow up
5. Plan for peer review of TSO capability through IAEA services, including inir, irrs



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

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Thank you!