



Development of Training Material on Regulatory Inspection of Research Reactors

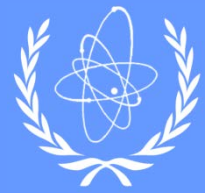
Research Reactor Safety Section
Division of Nuclear Installation Safety

IAEA

The Global Nuclear Safety and Security Network (GNSSN)

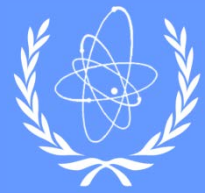
Steering Committee Meeting

VIC, 16-17 April 2018



Outline

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Introduction

- The feedback from the IAEA's activities on research reactor safety has shown that there is a need in many Member States to improve the regulatory supervision of research reactors.
- The results of IAEA safety review missions have identified, in many cases, areas for improvements to the regulatory supervision of research reactors, specifically the need to establish and implement systematic inspection programmes.
- Development of a training material has been initiated as one of activities to support Member States to improve their regulatory inspection programmes.



Introduction

- This training material was developed with support from the GNSSN in the frame of ANNuR projects on enhancing regulatory supervision of research reactors.
- Other activities include:
 - *Development of a regulatory inspection programme for Morocco regulator;*
 - *Systematic assessment of regulatory competence and training needs;*
 - *Regulatory review and assessment;*
 - *Meetings and workshops on these topics.*



Showcasing an Inspection Programme

- The inspection programme for the Morocco regulator is systematically developed in accordance with IAEA Safety Standards including,
 - *Organization for inspection*
 - *Types of regulatory inspection*
 - *Inspection frequency*
 - *Areas and programmes to be inspected*
 - *Conduct of inspections*
 - *Enforcement policy*



IAEA Assistance regarding Regulatory Supervision

For research reactors, the IAEA provides assistance through regular budget and TC activities on:

- Regulatory inspection;
- Regulatory review and assessment;
- Regulatory and safety infrastructure for countries embarking the first research reactor programme.



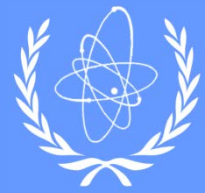
Objectives of Training Material

- To establish and implement regulatory inspection programmes for research reactors
- To improve the competencies of regulatory staff in charge of regulatory inspections for research reactors
- To share with Member States. The training material will be posted in the IAEA GNSSN webpage on e-learning along with already published training material:
 - *Safety of Research Reactors, IAEA-TCS-64/CD, 2016*
 - *Operational Radiation Protection and Radioactive Waste Management for Research Reactors, IAEA-TCS-62/CD, 2016*



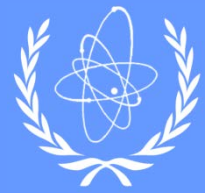
Scope

- The scope of the training material on regulatory inspection of research reactors covers all topics relevant to all phases of the life cycle of the research reactor facility.
- Inspection guidelines and topics covered in the training material on regulatory inspection of research reactors are consistent with those provided for the Integrated Safety Assessment of Research Reactors (INSARR).



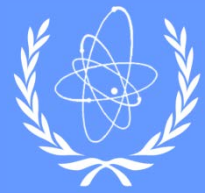
Development of Training Material

- 1st Consultancy Meeting, Vienna, 10-13 April 2017
- 2nd Consultancy Meeting, Vienna, 25-29 September 2017
- IAEA internal review in accordance with IAEA process, March 2018
- Final stage of publication (approval)



Testing of Training Material

- Over the past few years, draft training material on regulatory inspection of research reactors has been tried in several activities under the ANNuR, FNRBA and ANSN including in Australia, Egypt, Ghana, Malaysia, and South Africa.
- Feedback from participating Member States has been used to improve this training material.



Structure and Contents of the Training Material

The training material consists of 35 modules in 6 training blocks covering:

- *Block 1* Introduction - 3 modules;
- *Block 2* IAEA safety standards relevant to inspection – 5 modules;
- *Block 3* Regulatory inspection programme - 5 modules;
- *Block 4* Inspection topics - 17 modules;
- *Block 5* Practical exercises - 3 modules;
- *Block 6* Course evaluation and closure - 2 modules.



Block 2 Regulatory Basis and Requirements for Use in Inspection of Research Reactors

- 2.1 Governmental, legal and regulatory framework for safety
- 2.2 Role and functions of the regulatory body
- 2.3 Regulatory inspection programme for research reactors
- 2.4 Interfaces of regulatory inspection programmes with licensing activities for research reactors
- 2.5 IAEA safety standards and related documents on regulation of research reactors



Block 3 Establishment and Implementation of a Regulatory Inspection Programme

- 3.1 Planning and preparation for inspections
- 3.2 Conduct of inspections
- 3.3 Inspections reports and findings
- 3.4 Enforcement process
- 3.5 Use of a graded approach in inspections



Block 4 Inspection Topics for Research Reactors

- 4.1 Siting and site preparation
- 4.2 Design and construction
- 4.3 Commissioning
- 4.4 Operational limits and conditions
- 4.5 Safety committee
- 4.6 Operating organization and reactor management
- 4.7 Training and qualifications
- 4.8 Conduct of operations
- 4.9 Maintenance and periodic testing



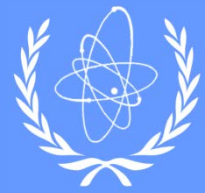
***Block 4* Inspection Topics for Research Reactors**

- 4.10 Modifications
- 4.11 Utilization and experiments
- 4.12 Management system
- 4.13 Operational radiation protection
- 4.14 Radioactive waste management
- 4.15 Emergency planning
- 4.16 Fire safety
- 4.17 Extended shutdown



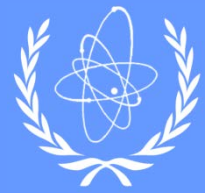
Contents of Each of the Modules in *Block 4*

- ✓ Inspection Objectives
- ✓ Technical Background
- ✓ Specific Preparation for the Inspection
- ✓ Specific Inspection Techniques and Methods
- ✓ Inspection Guidelines
- ✓ Practical Examples



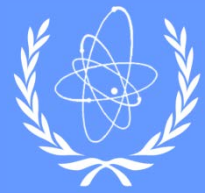
Block 5 Practical Exercises

- 5.1 Preparation for an inspection
- 5.2 Conduct of an inspection
- 5.3 Reporting on the inspection



Concluding Remarks

- A systematic and comprehensive training material on regulatory inspection of research reactors has been developed by the IAEA.
- The training material is consistent with topics and guidelines covered in the INSARR and is based on the requirements of IAEA Safety Standards.
- The training material provides a resource for regulatory bodies to use for the training of inspection staff.



Upcoming Activities for GNSSN (2018)

- ANNuR/FNRBA Workshop on Regulatory Inspection Programme in Morocco during 12-16 November 2018

- ANNuR/FNRBA Annual Meeting on Safety and Licensing in Ghana during 08-12 October 2018



Thank you for your attention!