

IAEA Activities on Research Reactor Safety and IAEA Safety Standards on Licensing Process

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Introduction: Overview of Research Reactors (RRDB)

Built to date: about 700

Operational	234
Temp. shutdown	13
Shutdown	142
Decommissioned	298



Under construction/planned:

Argentina, Azerbaijan, Bolivia, Brazil, France, Indonesia, Korea, Mongolia, Netherlands, Saudi Arabia, Sudan, Tanzania, Tunisia, USA, Vietnam.

Region	Operational Research Reactors
Africa	10
Americas	66
Asia/Pacific	52
Europe	106

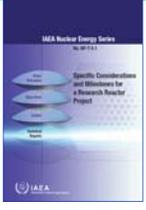
RRSS activities -- Updating

- Conducting INSARR review services - 15 INSARR/Expert Missions, on average per year.
- Dissemination of operating experience
 - Operating the IRSRR and organizing regular meetings for exchange of operating experience.
 - The IRSRR currently joined by 58 Member States (more than 95 % of the facilities are covered).
 - Operating experience from the events reported to IRSRR was published in 2015 (Tecdod 1762).
- Monitoring safety of Research Reactors under Project and Supply Agreements - 27 research reactors in 23 countries



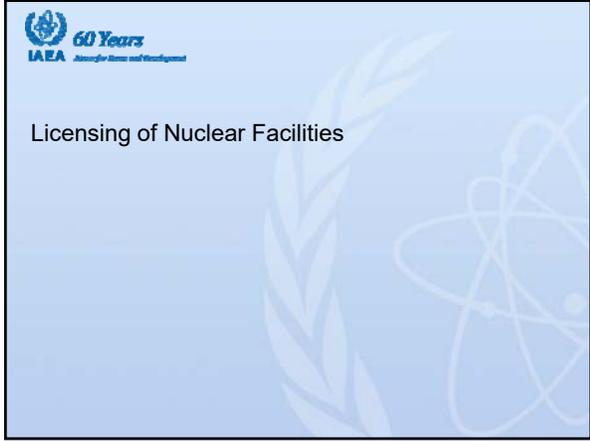

RRSS activities -- Updating

- Capacity Building – Education & Training
 - More than 40 Workshops and Technical Meetings since 2010
 - Training Courses and Training Material
 - Online video presentations on safety standards and key technical areas
- Coordinated Research Projects
- Infrastructure for first/new research reactor programmes (with NE, NA, and TC)
 - Publications; Conduct of advisory services and expert missions; Training workshops and meetings.
- Support TC programme and information networks – Regional Advisory Safety Committees, Information networks (ANSN, ANNuR etc.)

IAEA 60 Years
 Alliance for Peace and Development

Licensing of Nuclear Facilities



IAEA Safety Standards - GSR Part 1 (Rev.1) – Government, Legal and Regulatory Framework for Safety - Authorization



- Requirement 23 to 26 cover requirements regarding authorization of facilities and activities namely:
 - Authorization by the regulatory body, including specification of the conditions necessary for safety, shall be a prerequisite
 - Adequate demonstration of safety in support of an application for the authorization of a facility or an activity
 - Review and assessment of information relevant to safety **prior to authorization** and **again over the lifetime** of the facility
 - Review and assessment of a facility or an activity shall be commensurate with the radiation risks associated with the facility or activity, in accordance with a **graded approach**

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IAEA Safety Standards – SSR-3 - Safety of Research Reactors –Authorization Process



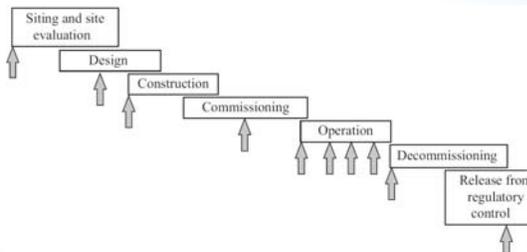
- “3.4. The authorization process is ongoing, starting at the site evaluation stage and continuing up to and including the release of the facility from regulatory control. The authorization process may vary among States, but the major stages of the authorization process for nuclear research reactors shall include the following:
 - (a) Site evaluation; (b) Design; (c) Construction; (d) Commissioning; (e) Operation, including utilization and modification; (f) Decommissioning; (g) Release from regulatory control.
- 3.5. In some cases, several stages may be authorized by a single licence, but conditions are attached to it to control the subsequent stages. Despite these differences between national practices, a detailed demonstration of safety in the form of a **safety analysis report** that includes an adequate safety analysis shall be submitted by the operating organization to the regulatory body for review and assessment **as part of the authorization process.**”

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IAEA Safety Standards SSG-12 – Licensing Process for Nuclear Installations



- Stages in the lifetime of a Nuclear Installation



The arrows indicate where hold points may be imposed

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IAEA Safety Standards SSG-12 – Licensing Process for Nuclear Installations - Basic licensing principles



- **Objective** of granting authorizations
 - to establish **regulatory control** over all activities and facilities where safety is concerned
- The legal framework of the State should set out the responsibilities for issuing a licence or authorization
- Licensing principles should be established in the regulatory and legal framework
- The licensing process should be
 - understood by the parties concerned and **predictable**
- Licences may be granted for
 - specific time period
 - indefinite period of time
 - specific activity or specific condition of the NI

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IAEA Safety Standards SSG-12 – Licensing Process for Nuclear Installations - Basic licensing principles



- The licensing process involves fulfilment of a set of regulatory requirements
- Procedures should be prepared by the RB
 - for each stage of the lifetime and each type of NI and to ensure that all necessary steps have been taken
- Licence conditions
 - additional specific obligations with the force of law
 - incorporated into the licence, to supplement general requirements or to make them more precise
 - stated explicitly, or included by reference or attachment

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IAEA Safety Standards SSG-12 – Licensing Process for Nuclear Installations - Main contents of a licence



- The licence should include
 - a unique licence identification
 - the issuing authority
 - identification of the individual or organization legally responsible for the licensed installation or activity
 - the maximum allowable inventories of sources covered
 - the requirements for notifying the regulatory body of any modifications that are significant to safety
 - any limits on operation and use
 - any separate additional authorizations that the licensee is required to obtain from the RB
 - requirements for reporting events and incidents
 - etc.

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IAEA Safety Standards SSG-12 – Licensing Process for Nuclear Installations - Graded Approach



- Graded approach should be used in determining the scope, extent and level of detail of and the effort to be devoted to review, assessment and inspection, and the number of authorizations for any particular nuclear installation and its activities
- The **main factor** while using the graded approach should be the magnitude of the **risks associated** with the activities performed at the nuclear installation
- Graded approach should take into account the **potential consequences** of anticipated operational occurrences and accidents, including their probability of occurrence
- Graded approach to safety assessment should also take account of the maturity of the licensee organization, and complexity and ageing related issues relating to the nuclear installation and its activities
- The application of the graded approach should be reassessed and the scope, extent and level of detail of, and the effort devoted to, the review, assessment and inspection and the related licensing process should be revised accordingly

Graded approach is not a waiver from requirements

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Concluding remarks



- IAEA Safety Standards require
 - Authorizations to research reactors are issued by the regulatory body on the basis of a documented safety demonstration submitted by the licensee.
 - A graded approach in the licensing process is used, which is based on the risks associated with the facilities and activities.

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Research Reactor Safety Section (RRSS/NSNI)



To support MSs in achieving and maintaining a high level of safety of research reactors using peer reviews and advisory services based on IAEA safety standards

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