

Indian Nuclear Society's Annual Conference: INSAC-2024

Regulatory Framework for Nuclear Safety



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[November 19, 2024]

Outline

- Legal framework
- Regulatory Framework
- AERB Functions
 - RegDoc development, Licensing, Inspections
 - Safety Research
 - Public Awareness
 - International Cooperation
- Conclusion



Regulation




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- Need for Regulation ?
 - Equitable Allocation of Resources and Opportunity
 - Ensure Safety

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Legal framework



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- The **Atomic Energy Act, 1962** provides for the development, control and use of atomic energy for the welfare of the people of India and for other peaceful purposes and for matters connected therewith
- Rules framed under the **Atomic Energy Act, 1962**
 - **Atomic Energy (Radiation Protection) Rules, 2004**: Requirement of consent for carrying out any activities for nuclear fuel cycle facilities and use of radiation for the purpose of industry, research, medicine, etc.
 - **Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987**: Requirements for the disposal of radioactive waste in the country.
 - **Atomic Energy (Working of Mines, Minerals and Handling of Prescribed Substances) Rules, 1984**: Regulate the activities pertaining to mining, milling, processing and/or handling of prescribed substance.
 - **Atomic Energy (Factories) Rules, 1996**: Requirement in the nuclear establishments to ensure industrial safety.

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Legal framework



- AERB established, in 1983, under the provisions of the Atomic Energy Act, 1962 to carry out certain regulatory and safety functions envisaged under Sections 16, 17 and 23.
- AERB is the national regulatory body having powers to frame safety policies, lay down safety standards & requirements and powers to monitor & enforce provisions under the Act and Rules thereof, in nuclear and radiation installations and practices.

Safety regulation to ensure that the nuclear facilities are built and operated in a safe manner and they do not cause unacceptable radiological risk and/or toxic chemical exposure to plant & site personnel, the public and the environment.

Regulatory Framework



Control of Nuclear facilities and material
Department of Atomic Energy

Control of Radiation applications

- Department of Atomic Energy
Ex-import of radioactive substance
- Other Line Ministries under relevant law
Ex- radiation generating equipment

Environmental Protection

- Ministry of Environment, Forest & Climate Change
(EPA, 1986)

Atomic Energy Regulatory Board

Regulation of radiation safety under The Atomic Energy Act, 1962 all across the country

Administration of industrial safety under Factories Act-1948 (units of DAE)

Regulation of nuclear security having bearing on safety within Main Plant Boundary of NPPs

Notification of Nuclear Incident-CLND Act 2010

Present Mandate Derived From...



AE Act, 1962

- **S.O.4772 (AERB's Constitution Order)**
 - regulation of radiation safety under The Atomic Energy Act, 1962 all across the country
 - regulation of industrial safety under The Factories Act, 1948 in all units of DAE
- Merging of SRC and transfer of DRP activities
- **Additional mandate** : regulation of nuclear security having bearing on safety within Main Plant Boundary of NPPs
- **Chairman, AERB is competent authority under**
 - Atomic Energy (Radiation Protection) Rules, 2004
 - Atomic Energy (Safe Disposal of Radioactive Waste) Rules, 1987
 - Atomic Energy (Working of Mines, Minerals and handling of Prescribed Substance) Rules, 1987

Other Statutes

- **CLND Act, 2010**
 - Notification of nuclear incident and cause wide publicity
- **Environment Protection under Act**
 - power of entry and inspection
 - Power to collect samples
 - Review of emergency plan and notification of accidents under MSIHC Rules, 1989
- **National Disaster Management Plan**
 - Provide support in preparation of national plan for Nuclear & Radiological emergencies

* BARC facilities and industrial safety in mines is not under the purview of AERB

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AERB Functions



- **Development** of Regulatory Documents for siting, design, construction, commissioning, operation and decommissioning for nuclear and radiation facilities,
- Granting **consents** for siting, construction, commissioning, operation and decommissioning, after an appropriate safety review and assessment of nuclear and radiation facilities,
- Ensuring **compliance** with the regulatory requirements prescribed by AERB during all stages of consenting,
- Prescribing the acceptable **limits** of radiation exposure to occupational workers and members of public and acceptable limits of environmental releases of radioactive substances,
- Reviewing the **emergency** preparedness plans for nuclear and radiation facilities and during transport of large radioactive sources, irradiated fuel and fissile material.

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AERB's presence



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AERB Headquarter, Mumbai



Eastern Regional Regulatory Centre, Kolkata



Southern Regional Regulatory Centre, Chennai


Northern Regional Regulatory Centre, Delhi




Safety Research Institute, Kalpakkam

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Regulatory Document Development



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- Act
Rules
Constitution Order of AERB
- Directives / Orders / Gazette
Notifications
- Safety Codes/Safety Standards
Nuclear Security
Requirements
- Safety Guides
Nuclear Security Guides
- Safety Manuals
Nuclear Security Manuals

160+ Regulatory Documents

Mechanism for
Development of the
Regulatory
Documents

Identification of Documents to
be Developed / to be revised

Preparation, Review, Approval
& Issuance

Stakeholder involvement

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Licensing



Regulatory system comprehensively covers all consenting stages.

Extent of safety review - Graded Approach.

Multi-tier Review Process of AERB

- Prime responsibility of ensuring safety of NPPs rests with the organization responsible for operation of NPPs.
- Task of laying down necessary safety requirements and their enforcement are by AERB.

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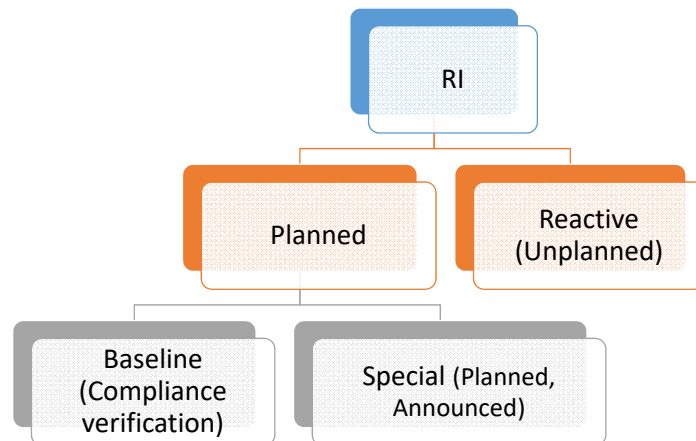
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Regulatory Inspections



• Legal Provisions

- Atomic Energy Act, 1962, Sec-17 (4)
- Radiation Protection Rule 2004, Rule 30
- Rule 6 of the Atomic Energy (Factories) Rules, 1996
- Rule 10 of the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987
- Carried out in all stages during the NPP lifecycle



Unplanned Inspections can be either Announced or Un-Announced

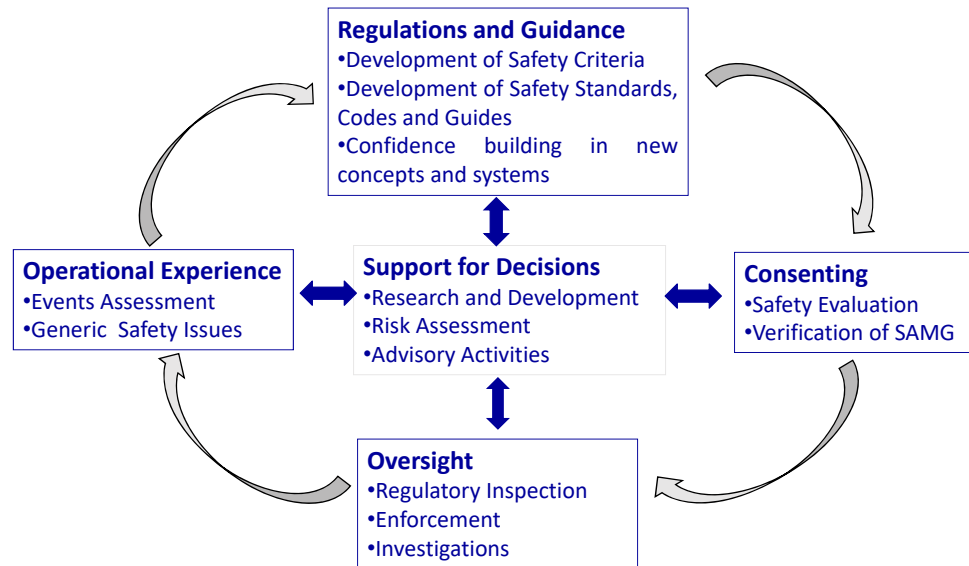
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Safety Research

- To provide scientific and technical basis needed for the decision-making
- Enhances Regulatory Effectiveness and Efficiency
- Confirmatory & Anticipatory
- Direct Mode & TSO Mode



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Public awareness

- AERB considers all members of public should have access to objective and unbiased information on safety issues.
- AERB periodically issues press releases to keep the public informed about important regulatory and other related activities.
- The information on various activities of AERB is also made public through the periodic newsletters and annual reports.
- Relevant information is also provided for queries raised in the Parliament of India and by general public either through direct interaction with senior officers of AERB or under the Right to Information Act.

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International Cooperation



- AERB is actively involved with various international bodies for exchange of information and cooperation in the field of regulation of nuclear activities.
- AERB experts participate in various activities of IAEA, OECD-NEA and have been contributing at various other international fora.
- National coordinator for IAEA-CNS, IAEA-INES, IAEA-IRS and Fuel Incident Notification and Analysis System (FINAS).
- AERB officials participate as member in the IAEA’s IRRS Missions to various countries, Committee on Safety Standard (CSS) and IAEA Coordinated Research Programme (IAEA-CRP), IAEA International Collaborative Standard Problems (IAEA-ICSP), CANDU Senior Regulators meetings, CANDU PSA Working Group, Committee on Safety of Nuclear Installations (CSNI), Committee on Nuclear Regulatory Activities (CNRA) and their WGs.

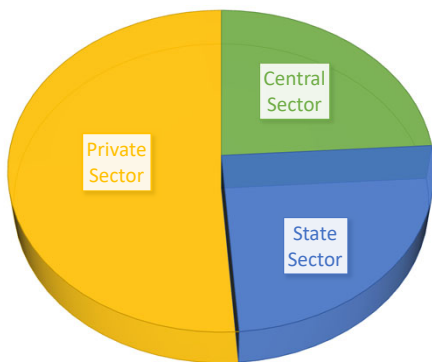
AERB plays an active role in strengthening the global safety regime and towards this contributes in various meetings, peer review missions and development of safety standards of IAEA.

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Indian Power sector at a glance

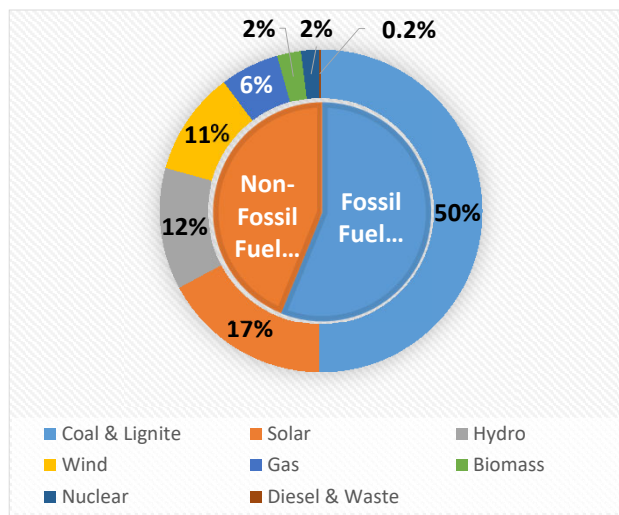


GENERATION CAPACITY 4,25,536 MW



Source : Central Electricity Authority, Oct 31, 2023

Target: Net Zero @ 2070



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Conclusion




- AERB has completed journey of four decades and is an experienced, knowledgeable and dedicated regulatory body for the protection of the public and environment.
- AERB has put in place a comprehensive system for design and operational safety review of NPPs in the country.
- A number of safety documents have been developed to aid in Licensing/Reviews, etc.
- The Licensing and Regulatory Inspection process are continually optimized.
- Emphasis placed for competency enhancement.
- Feedback from operational experience and lessons learned from major incidents both within and outside the country have been appropriately utilized for enhancing safety.
- AERB is gearing itself to deal with the current and future challenges in regulating radiation and nuclear safety, such as monitoring ageing and decommissioning, as well as providing oversight of the construction, commissioning and operation of new NPPs and RFs.

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Acknowledgement



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- Dr Mayank Verma
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Thank you
for your attention...

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