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REGULATORY SAFETY DOCUMENTS

AERB develops and lays down safety requirements and guidance for utilities and users in the form of Regulatory Safety Documents (REGDOC). These REGDOCs are issued under provisions of Atomic Energy Act, 1962 and Atomic Energy (Radiation Protection) Rules, 2004. The REGDOCs are developed with a view to cover the entire spectrum of regulated Nuclear, Radiation and associated facilities and activities, as applicable, with graded approach.

AERB has established the process for Development/ Revision of REGDOCs. During the preparation,

REGDOCs undergo multi-tier review system. The experts from AERB, Technical Support Organisations (TSO), National R&D Centres, Industries, Academic Institutes and other Government Organisations are involved in the process as applicable. Apart from these experts, retired employees having experience in the related fields are also involved as appropriate.

The REGDOCs issued by AERB are categorized in the following hierarchy. Also, following aspects are taken into account during preparation of REGDOCs:



Hierarchy of REGDOCs

The minimum requirements specified in Safety Codes and Safety Standards are mandatory in nature. Safety Guide is a document containing detailed guidance and methodologies that are acceptable to AERB to implement the specific parts of a Safety Code/ Safety Standard.

AERB has published more than 165 Regulatory Safety documents. These REGDOCs provide adequate coverage commensurate with the radiation risks associated with the facilities and activities following a graded approach.

6.1 REGULATORY SAFETY DOCUMENT DEVELOPMENT PROCESS

AERB has a well established framework for development of its Regulatory Documents. It consists of multi-tier review involving experts and takes account of the views of various stakeholders at different stages of development. This ensures development or revision of regulatory documents based on, inter alia, state of the art scientific knowledge, national and international experience gained and includes consideration of views of experts, stakeholders.

Similar to IAEA's Commission on Safety Standards, AERB has an Advisory Committee on Nuclear and Radiation Safety (ACNRS), which supports in the review of draft regulatory documents and safety issues and provide advice to AERB. ACNRS consists of senior experts in the areas relevant to nuclear & radiation safety and its regulation.

Of late, AERB has taken many initiatives to make the process of development of regulatory documents more efficient. Recently, AERB has added one more process of regular Progress Review Meetings (PRM) to monitor progress of various regulatory documents under development and to enable speedy resolution of the issues faced.

6.1.1 Brief Process of Development of REGDOCs

The Safety Document Development Proposal (SDDP) for revision/development of Regulatory Safety

Documents (REGDOC) is prepared by In-House Working Groups (IHWG) of AERB. The SDDPs are further reviewed by AERB Standing committee for REGDOCs and vetted by AERB Executive Committee (AERB-EC) prior to review by an Advisory Committee on Nuclear and Radiation Safety (ACNRS) which is an Apex Committee of AERB for providing advice on the REGDOCs. Based on the recommendation of ACNRS, SDDP is approved by Chairman, AERB. The initial draft of REGDOC is prepared based on the SDDP by officers of AERB or by Consultant, as required. The flow chart depicting this process is as given in Figure 6.1.

The initial draft is reviewed by AERB Task Force (AERB-TF) duly constituted for the purpose and then by ACNRS. Revised draft is circulated among the domain experts, both within and outside DAE for obtaining their review comments. The resulting draft is put up for approval by Chairman, AERB. In case of Safety Codes, the final draft is put up on AERB website for one month to obtain public comments. The finalized version of draft Safety Code incorporating public comments is submitted to Board for approval/publication.

6.2 REGULATORY SAFETY DOCUMENTS DEVELOPED/AMENDED

Following two Safety Guides were issued and uploaded on AERB website.

(i) Safety Guide on “Remediation of Areas Affected by Radioactive Contamination” [AERB/NRF/SG/RW-9, 2019]

This safety guide provides guidance for planning and implementing remediation of areas affected by radioactive contamination. It also provides guidance for protective and remedial actions that are intended to reduce the existing exposure and to avert potential for the likelihood of such exposure from the related contamination. It addresses aspects related to radiation protection criteria, responsibilities of organisations / agencies involved, characterization and evaluation of affected areas, waste management aspects and criteria for release of remediated area from regulatory control.

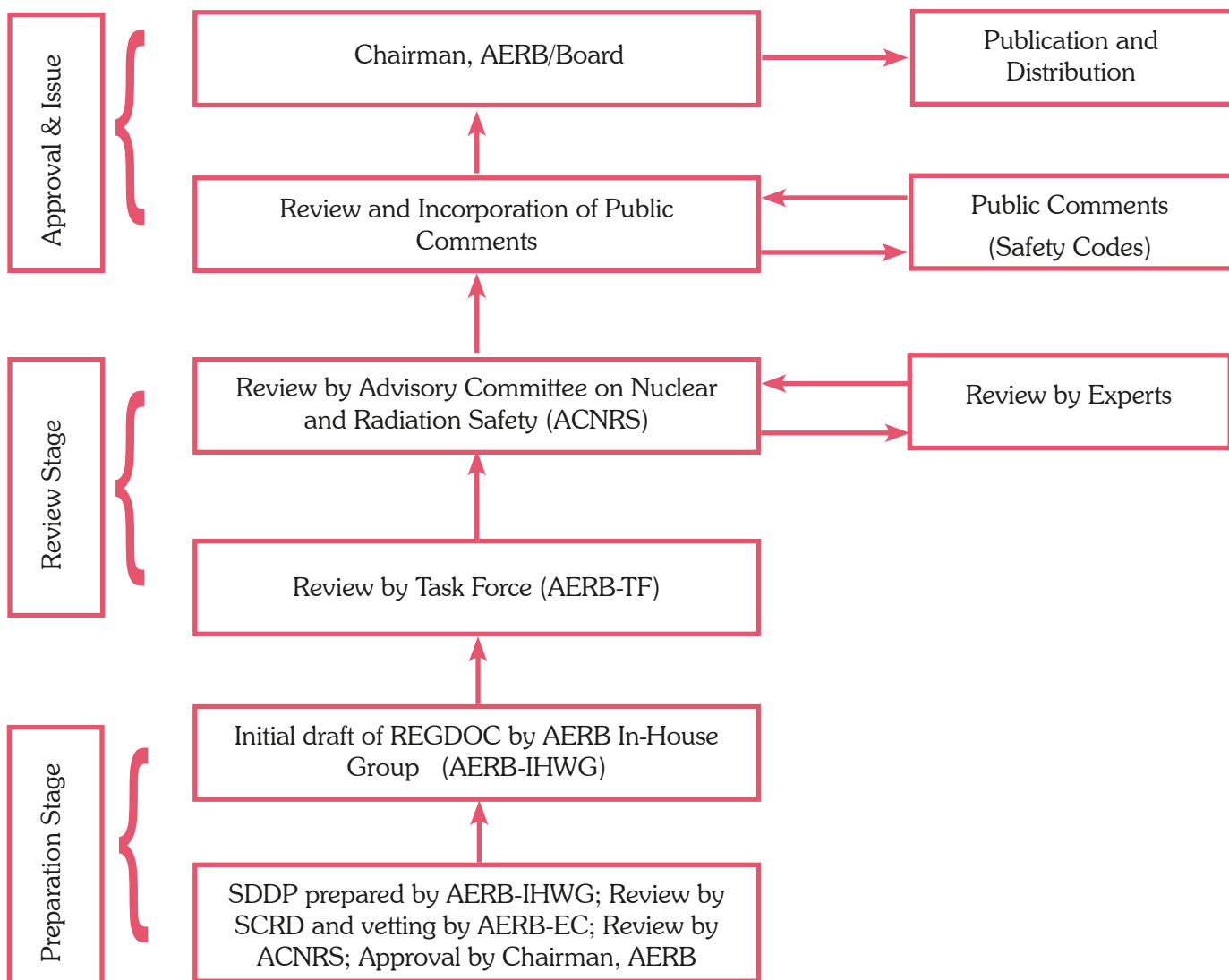


Fig. 6.1 : AERB Regulatory Safety Document Development Process

(ii) Safety Guide on “Monitoring and Assessment of Occupational Exposure due to Intake of Radionuclides” [AERB/NRF/SG/RP-1, 2019]

This safety guide provides guidance for the dose assessment of radiation workers due to internal uptake of radionuclides. This guide is applicable for the internal dosimetry of personnel working in nuclear fuel cycle facilities and radiation facilities having potential for internal exposure such as:

- (a) Mining and milling of uranium and thorium ores
- (b) Fuel enrichment/fabrication facilities
- (c) Nuclear power plants
- (d) Research/experimental reactors
- (e) Fuel reprocessing plants
- (f) Radioactive waste management plants, and



(g) Radiation facilities producing or handling large quantities of radionuclides for medical industrial, research purpose.

(d) Safety Guide on ‘Management of Nuclear & Radiation Emergencies at Nuclear Facilities’ (AERB/SG/NRE-1, New).

6.3 SAFETY DOCUMENTS UNDER REVISION/ DEVELOPMENT

REGDOCs on different topics are being developed or being revised in accordance with the established process. The summary is as follows:

6.3.1 The initial drafts of the following REGDOCs, either New or Revision are in progress

- (a) Safety Code on ‘Management for Safety in Nuclear Facilities’ (AERB/SC/MS, New) - Revision of earlier Safety Code on ‘Quality Assurance (QA) for Nuclear Power Plants (AERB/SC/QA (Rev.1))
- (b) Safety Guide on ‘Safety Classification and Seismic Categorisation for SSCs of NPPs’ (AERB/SG/D-1 (Rev. 1))
- (c) Safety Guide on ‘Deterministic Safety Analysis for Water Cooled Reactors’ (AERB/SG/WCR/D-19, New)

6.3.2 Draft REGDOCs which are under Review in TF/ ACNRS

- (a) Safety Code on ‘Design of Pressurized Heavy Water Based Nuclear Power Plant’ (AERB/NPP-PHWR/SC/D (Rev.2))
- (b) Safety Code on ‘Design of Sodium Cooled Fast Reactor Based Nuclear Power Plant’ (AERB/NPP-SFR/SC/D, New)
- (c) Safety Standard on ‘Civil Engineering Structures Important to Safety of NFs’ (AERB/SS/CSE (Rev.1))
- (d) Safety Code on ‘Management of Nuclear & Radiological Emergencies’ (AERB/SC/NRE, New)
- (e) Safety Guide on ‘Design of Fuel Handling and Storage Systems for NPPs’ (AERB/SG/D-24 (Rev.1))
- (f) Safety Guide on ‘Seismic Studies and Design Basis Ground Motion for NF Sites’ (AERB/SG/S-11 (Rev.1))

6.3.3 Draft REGDOCs which are under advance stages of preparation

- (a) Safety Guide on 'Consenting Process for Nuclear Power Plants' (AERB/SG/G-1 (Rev.1))
- (b) Safety Guide on 'Design Basis Events (DBE) for NPPs' (AERB/SG/D-5 (Rev.1))
- (c) Safety Guide on 'Accident Management Programme for Water Cooled NPPs' (AERB/SG/D-26, New)
- (d) Safety Guide on 'Periodic Safety Review (PSR) of Nuclear Power Plants' (AERB/SG/O-12 (Rev.1))
- (e) Safety Guide on 'Design of Electrical Power Systems of Nuclear Power Plants' (AERB/SG/D-11 (Rev.1))
- (f) Safety Guide on 'Criticality Safety Fissile Material Handling Facilities' (AERB/BE-FCF/SG-3, New)

6.4 REVIEW OF IAEA DRAFT SAFETY STANDARDS

India has been significantly contributing towards fulfilling mission of IAEA, since its first international conference in Geneva in 1955, Chaired by Dr. Homi Jahangir Bhabha. One such area is development of Safety Standards and Nuclear Security series. AERB contributes towards development of all Safety Standards and Nuclear Security series of IAEA through following means:

6.4.1 Participation in Standards Committee

IAEA has five safety standards committee namely,

- (i) Emergency Preparedness and Response Standards Committee (EPRReSC),
- (ii) Nuclear Safety Standards Committee (NUSSC),
- (iii) Radiation Safety Standards Committee (RASSC),
- (iv) Transport Safety Standards Committee (TRANSSC), and
- (v) Waste Safety Standards Committee (WASSC).

These Safety Standards committees of IAEA focus on respective areas important to Safety and Security. AERB experts have been contributing in all the above mentioned IAEA Standards Committees.

These standards are further reviewed by the Commission on Safety Standards (CSS) consisting of

senior experts from IAEA member states holding national responsibilities for establishing standards in their respective countries. Chairman of AERB is the member from India in the CSS.

6.4.2 Review of Draft IAEA Standards

From India, AERB coordinates and leads the review of the draft standards. In review of the draft standards, experts from the licensees and Technical Support Organisations are also given opportunity to provide their views on the draft IAEA standards.

6.4.3 Participation in Development of IAEA Standard

AERB experts also participate in development of many of the draft IAEA Standards depending on their specific area of expertise in safety regulation.

The following draft IAEA documents were reviewed during the reporting period:

6.4.4 IAEA Draft DPPs & Documents (Non-CSS)

- (a) Operational Limits and Conditions and Operating Procedures for Nuclear Power Plants (DS 497A)
- (b) Modifications to Nuclear Power Plants (DS 497B)
- (c) The Operating Organisation for Nuclear Power Plants (DS 497C)
- (d) Core Management and Fuel Handling for Nuclear Power Plants (DS 497D)
- (e) Maintenance, Surveillance and In-Service Inspection of NPPs (DS 497E)
- (f) Recruitment, Qualification and Training of Personnel for Nuclear Power Plants (DS 497F)
- (g) Conduct of Operations at Nuclear Power Plants (DS 497G)
- (h) Safety Assessment for Research Reactors and Preparation of the Safety Analysis Report [SSG-20 (DS 510A)]
- (i) Safety in the Utilization and Modification of Research Reactors [SSG-24 (DS 510B)]
- (j) Equipment Qualification for Nuclear Installations (DS 514).

6.4.5 IAEA Draft DPPs & Documents (CSS)

- (a) Radiation Safety in Well Logging (DS 419)
- (b) Radiation Safety in the use of Nuclear Gauges (DS 420)
- (c) Radiation Safety of Accelerator Based Radioisotope Production Facilities (DS 434)
- (d) Design of Auxiliary and Supporting Systems for NPPs (DS 440)
- (e) Format and Content of the Safety Analysis Report for Nuclear Installations (DS 449)
- (f) Management of Radioactive Residues from Mining, Mineral Processing, and other NORM related Activities (DS 459)
- (g) Safety Guide on 'Preparedness and Response for an Emergency during the Transport of Radioactive Material', Revision of TS-G.1.2 (DS 469)
- (h) Arrangements for Public Communications in Preparedness and Response for a Nuclear or Radiological Emergency (DS 475)
- (i) Design of Fuel Handling and Storage Systems for Nuclear Power Plants (DS 487)
- (j) Storage of Spent Nuclear Fuel (DS 489)
- (k) Safety Guide on 'Protection against Internal Hazards in the Design of Nuclear Power Plants', revision and combination of NS-G-1.7 and NS-G-1.11 (DS 494)
- (l) Safety Guide Advisory Material for IAEA Regulations for 'Safe Transport of Radioactive Material' - Edition for the SSR-6 (Rev. 1) (DS 496)
- (m) Safety Guide Schedules of Provisions of the IAEA Regulations for 'Safe Transport of Radioactive Material' (20xx Edition), revision of SSG-33 (DS 506)
- (n) DPP on 'Leadership, Management and Culture for Safety', revision of GS-G-3.1 (DS 513)
- (o) Safety Guide on 'Criticality Safety in the Handling of Fissile Material', revision of SSG-27 (DS 516)
- (p) Revision of Safety Guides SSG-5 on 'Safety of Conversion Facilities and Uranium Enrichment Facilities', SSG-6 on 'Safety of Uranium Fuel Fabrication Facilities' and SSG-7 on 'Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities' (DS 517)
- (q) Revision of SSG-42 on 'Safety of Fuel Reprocessing Facilities' and SSG-43 on 'Safety of Nuclear Fuel Cycle Research and Development Facilities' (DS 518)
- (r) DPP on 'Protection of Workers against Exposure due to Radon' (DS 519)
- (s) DPP on 'External Human Induced Hazards in Site Evaluation for Nuclear Installations', revision of NS-G-3.1 (DS 520)
- (t) DPP on 'Evaluation of Seismic Safety for Existing Nuclear Installations', revision of NS-G-2.13 (DS 522)
- (u) DPP on 'Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants', revision of SSG-3 (DS 523)
- (v) DPP on 'Radiation Protection Aspects of Design for Nuclear Power Plants', revision of NS-G-1.13 (DS 524).