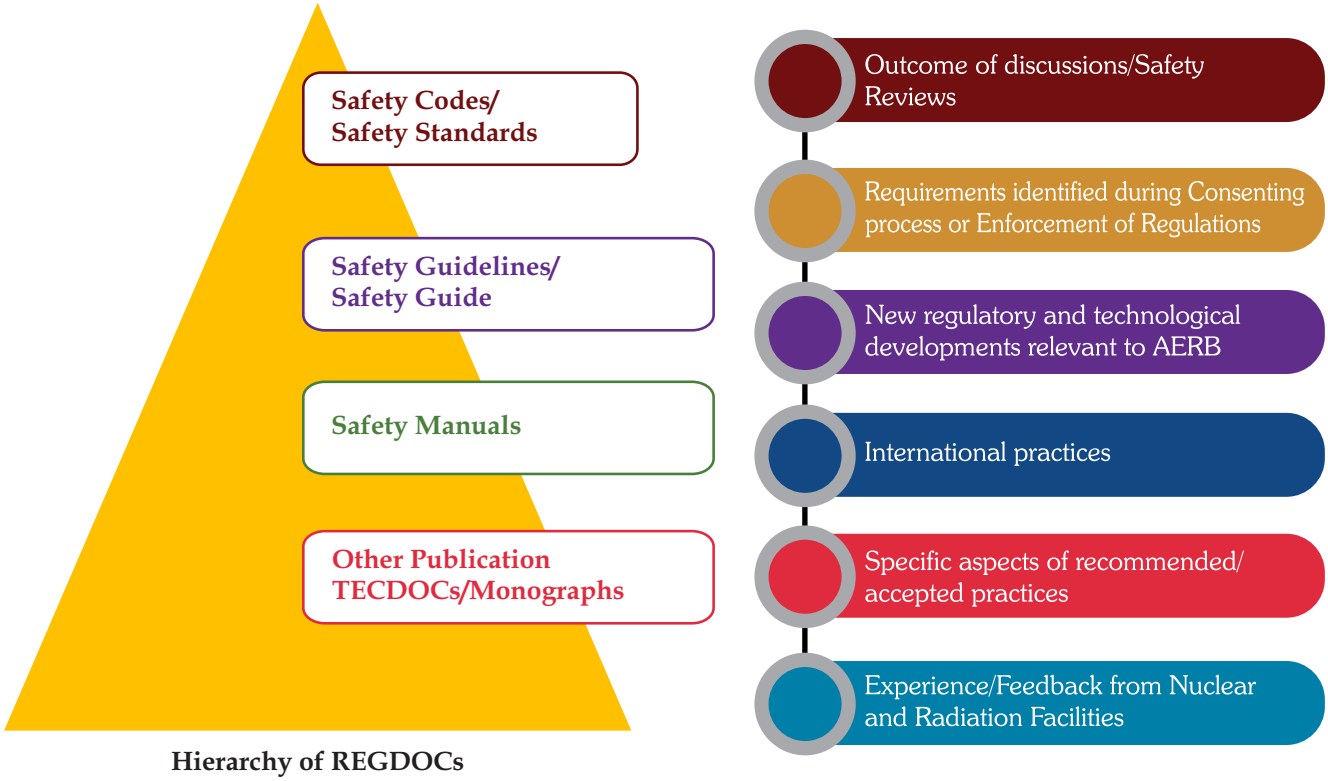
CHAPTER

6

REGULATORY SAFETY DOCUMENTS

One of the mandates of AERB is to develop Safety Codes, Standards and Guides for different types of facilities and activities under its purview, keeping in view the international recommendations and national requirements. Accordingly, AERB has put in place a well-established process and mechanism for development/revision of Regulatory Safety Documents (REGDOC). The framework for regulatory document development in AERB involves a multi-tier review system. The experts from AERB, Technical Support Organisations (TSO), National R&D Centres, Industries, Academic Institutes, other Government Organisations, and retired specialists having experience in the related fields are involved in the development process as appropriate.

Regulatory safety documents issued by AERB are classified as follows in descending order of hierarchy:



Hierarchy of REGDOCs

The requirements covered in Safety Codes, Safety Standards and Safety Guidelines are mandatory in nature. Safety Guide is a safety document containing detailed guidance and methodologies that are acceptable to AERB to implement the specific requirements of a Safety Code/Safety Standard. Safety guides are recommendatory in nature.

6.1 REGULATORY SAFETY DOCUMENTS DEVELOPMENT PROCESS

AERB has well established process for development, review, revision and publication of REGDOCs. Experts, utility and stakeholders are involved in the development of the regulations and guides by direct involvement as well as through comments and feedback throughout the development process. Technological advances, research and development work, relevant operational lessons learned and institutional knowledge are considered as appropriate in development/revision of the REGDOCs.

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 provides 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

Safety Document Development Proposal (SDDP) is prepared by AERB technical staff based on the requirement (development of new REGDOCs or revision of an existing REGDOC). The said SDDP after review in Standing Committee on REGDOCs (SCRD) and concurrence of 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 review and providing guidance on the REGDOCs. The flow chart depicting this process is as given in Figure 6.1:

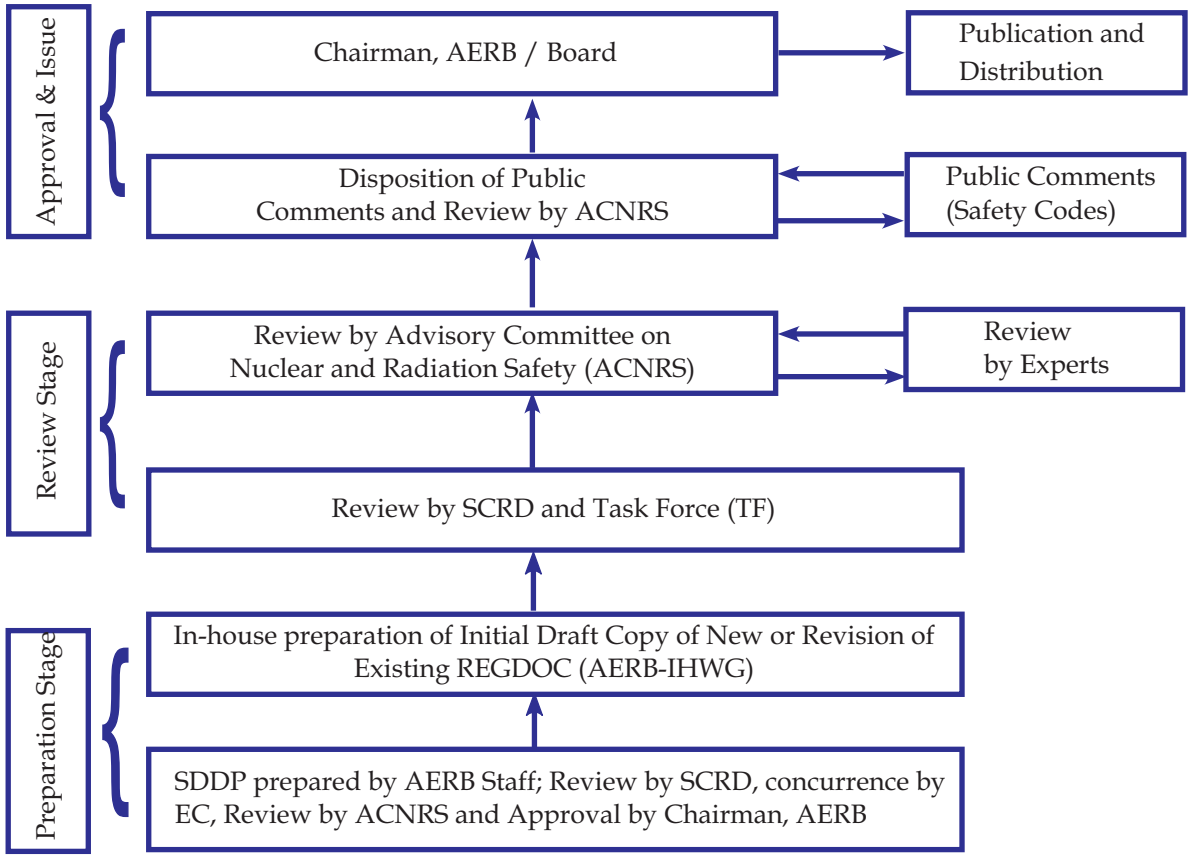


Fig. 6.1 AERB Regulatory Safety Document Development Process

Based on the recommendation of ACNRS, SDDP is approved by Chairman, AERB and subsequently the initial draft of revised or new REGDOC is prepared in-house within AERB by In-house Working Group (IHWG).

The initial draft is reviewed by SCRD, and Task Force (TF). The revised draft is then submitted to ACNRS for review. Subsequently the revised draft is circulated among the domain experts, both within and outside DAE for obtaining their review comments. The resulting draft after review by ACNRS, Technical Editing and Copy Editing is put up for approval by Chairman, AERB. In case of Safety Codes, the draft is put up on AERB external website for public comments (for specified time period). The disposition of public comments is carried out. The disposition is submitted to ACNRS before placing it in the Board for approval/publication.

AERB has issued regulations and safety documents which provide adequate coverage commensurate with the radiation risks associated with the facilities and activities, in accordance with a graded approach. Till date, AERB has published 158 regulatory safety documents which include Safety Codes, Standards, Guidelines, Guides and Manuals.

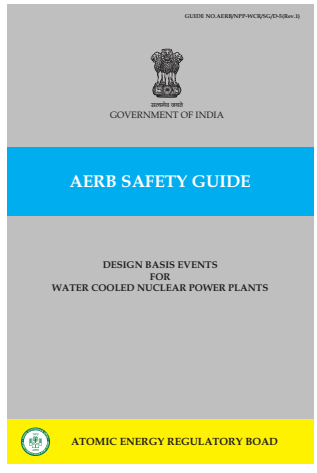
AERB REGDOCs

6.2 REGULATORY SAFETY DOCUMENTS DEVELOPED/REVISED

This year three Safety Guides were developed/ revised and uploaded on AERB website.

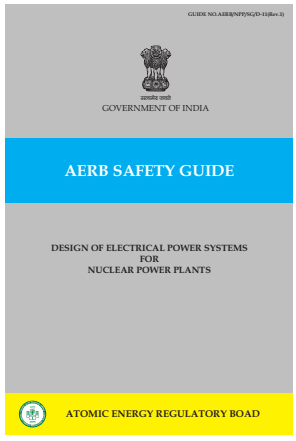
i) Safety Guide on "Design Basis Events for Water Cooled Nuclear Power Plants" [AERB/NPP-WCR/SG/D-5 (Rev.1)]

This safety guide describes and elaborate on the specific parts of the AERB Safety Codes on 'Design of Light Water Reactor' (AERB/NPP-LWR/SC/D) and 'Design of Pressurized Heavy Water Reactor' (AERB/NPP-PHWR/SC/D Rev.2). It provides guidance for identification, categorization and classification of postulated initiating events including multiple failures. This guide also provides typical lists of events to be considered for safety analysis and design of the water cooled reactors (PHWR, PWR and BWR), as well as methodology of practical elimination of certain events/conditions. The safety guide may be applied to other types of NPPs as well.



ii) Safety Guide on "Design of Electrical Power Systems for Nuclear Power Plants" [AERB/NPP/SG/D-11 (Rev.1)]

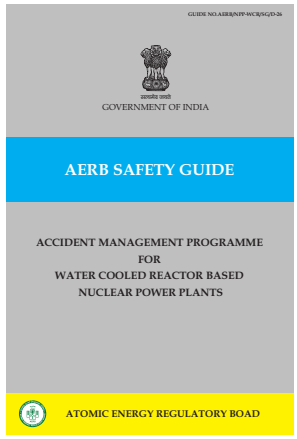
This safety guide is a technology neutral document issued in support of the safety requirements covered in safety codes on 'Design of Pressurized Heavy Water Reactor' (AERB/NPP-PHWR/SC/D Rev.2) and 'Design of Light Water Reactor' (AERB/NPP-LWR/SC/D).



It takes into account, the national and international developments in the design of Emergency Electric Power Systems for NPPs and expands the scope to include all electrical power systems that provide power to systems important to safety under Design Basis Accidents (DBA) and Design Extension Conditions (DEC). It provides considerations for deciding the necessary characteristics of electrical power systems, i.e. preferred power supply systems, emergency electric power systems and DEC power supply for NPPS and of the processes for developing these systems.

iii) Safety Guide on "Accident Management Programme For Water Cooled Reactor Based Nuclear Power Plants" (AERB/NPP-WCR/SG/D-26)

The safety guide provides guidance for development of accident management programme including severe accident management guidelines. It takes into account the recent developments regarding strengthening different levels of Defence-In-Depth (DID), particularly in the mitigatory regime and state-of-the-art approaches adopted by international organizations based on the lessons learnt from Accident at Fukushima Daiichi NPPs in 2011.



6.3 SAFETY DOCUMENTS UNDER REVISION/DEVELOPMENT

REGDOCs on different topics are being developed or being revised in accordance with established process. The R0 drafts of the following regulatory safety documents were prepared:

1) Safety Code on 'Management of Safety in Nuclear Facilities' (AERB/NF/SC/MS)

2) Safety Guide on 'Management of Nuclear and Radiological Emergency in Nuclear Facilities' (AERB/SG/NRE-1)

3) Safety Guide on 'Deterministic Safety Analysis for Sodium Cooled Fast Reactor based Nuclear Power Plants' (AERB/NPP-SFR/SG/D-19)

4) Safety Guide on 'Deterministic Safety Analysis for Water Cooled Reactor Based NPPs' (AERB/NPP-WCR/SG/D-19)

5) Safety Guide on 'Design of I&C Systems for NPPs' (AERB/SG/D-25 (REV. 1))

6) Safety Guide on 'Radiation Protection Aspects in Design of Nuclear Power Plants' (AERB/NPP/SG/D-12 (Rev.1))

7) Safety Manual on 'Radiation Protection in Nuclear Facilities' (AERB/NF/SM/O-2)

8) AERB Safety Glossary (AERB/SG/GLO).

The following draft regulatory safety documents are under subsequent stages:

1) Safety Code on 'Regulation of Nuclear and Radiation Facilities'(AERB/SC/G (Rev.1))

2) Safety Code on 'Management of Nuclear and Radiological Emergency' (AERB /NRF/SC/NRE)

3) Safety Standard on 'Civil Engineering Structures Important to Safety of NFs' (AERB/SS/CSE (Rev. 1)

4) Safety Guide on 'Industrial Radiography' (AERB/RF/SG/IR)

5) Safety Guide on 'Container Scanner' (AERB/RF/SG/CS)

6) Safety Guide on 'Industrial Accelerator Radiation Processing Facilities' (AERB/RF/SG/IARPF)

7) Safety Guide on 'Radiation Safety Aspects of Diagnostic Radiology' (AERB/RF/SG/DR)

8) Safety Guide on 'Medical Cyclotron Facilities' (AERB/RF/SG/MCF(Rev.1))

9) Safety Guide on 'Radiation Therapy' (AERB/RF/SG/RT)

10) Safety Guide on 'Seismic Studies and Design Basis Ground Motion for Nuclear Power Plant Site' (AERB/SG/S-11(Rev. 1))

11) Safety Guide on 'Design of Fuel Handling and Storage Systems for NPPs' (AERB/SG/D-24 (Rev. 1))

12) Safety Manual on 'Radiological Impact Assessment for Nuclear Power Plants' (AERB/NF/SM/RIA).

6.4 SAFETY DOCUMENTS UNDER PUBLICATION IN HINDI

The following AERB safety documents are translated in Hindi and are in the process of publication:

1) Safety Guide on 'Management of Nuclear Power Plants for Safe Operation' (AERB/SG/O-9, 1998).

2) Safety Guide on 'Management of Radioactive Waste Arising from Operation of Pressurised Heavy Water Reactor Based Nuclear Power Plants' (AERB/NPP/O-11, 2004).

3) Safety Guid on 'Operational Safety Experience Feedback on Nuclear Power Plants' (AERB/NPP/SG/O-13, 2006).

4) Safety Guide on 'Life Management of Nuclear Power Plants' (AERB/SG/O-14, 2005).

5) Safety Guide on 'Proof and Leakage Rate Testing of Reactor Containments' (AERB/NRF/SG/O-15, 2004)

6.5 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:

6.5.1 Participation in Standards Committee IAEA has five safety standards committee namely,

(i) Emergency Preparedness and Response Standards Committee (EPReSC)

(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, AERB is the member from India in the CSS.

6.5.2 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.

6.5.3 Participation in Development of IAEA Safety Standard/DPP

AERB experts also participate in development of many of the draft IAEA Standards depending on their specific area of expertise in safety regulation and provides comments. The following draft IAEA Safety Standards/Document Preparation Development Profile (DPP) were received/reviewed during the period:

1) Design of Nuclear Installations against External Events Excluding Earthquakes (DS498)

2) Protection against Internal and External Hazards in the Operation of Nuclear Power Plants (Ds503)

3) Assessment of the Safety Approach for Design Extension Conditions and Application of the Practical Elimination Concept in the Design of Nuclear Power Plants (DS508)

4) Maintenance, Periodic Testing and Inspection of Research Reactors (DS509B)

5) Core Management and Fuel Handling for Research Reactors (DS509C)

6) Operational Limits and Conditions and Operating Procedures for Research Reactors (DS509D)

7) The Operating Organization and the Recruitment, Training and Qualification of Personnel for Research Reactors (DS509E)

8) Ageing Management of Research Reactors (DS509G)

9) Instrumentation and Control Systems and Software Important to Safety for Research Reactors (DS509H).

10) Safety Assessment for Research Reactors and Preparation of the Safety Analysis Report (DS510A)

11) Safety in the Utilization and Modification of Research Reactors (DS510B)

12) Equipment Qualification for Nuclear Installations (DS514)

13) Compliance Assurance for the Safe Transport of Radioactive Material (DS515)-(Revision of Safety Guide No. TS-G-1.5)

14) Safety of Conversion Facilities and Uranium Enrichment Facilities ((Revision of SSG-5) DS 517)

15) Safety of Uranium Fuel Fabrication Facilities((Revision of SSG-6) DS 517)

16) Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities ((Revision of SSG-7) DS 517)

17) Development and Application of Level-1 Probabilistic Safety Assessment for Nuclear Power Plants(DS523)

18) DPP - SG Chemistry Programme for Water Cooled Nuclear Power Plants ((Revision of SSG-13) DS525).