GUIDELINES NO. AERB/NRF/SG/G-6 (Rev.1)

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GOVERNMENT OF INDIA

AERB SAFETY GUIDE

DEVELOPMENT OF REGULATORY SAFETY DOCUMENTS FOR NUCLEAR AND RADIATION FACILITIES

ATOMIC ENERGY REGULATORY BOARD

AERB SAFETY GUIDE NO. AERB/NRF/SG/G-6 (Rev.1)

DEVELOPMENT OF REGULATORY SAFETY DOCUMENTS FOR NUCLEAR AND RADIATION FACILITIES

Atomic Energy Regulatory Board
Mumbai-400 094
India

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Price:

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FOREWORD

Activities concerning establishment and utilisation of nuclear facilities and use of radioactive sources are to be carried out in India in accordance with the provisions of the Atomic Energy Act, 1962. In pursuance of ensuring safety of members of the public and occupational workers as well as protection of the environment, the Atomic Energy Regulatory Board (AERB) has been entrusted with the responsibility of laying down safety standards and enforcing rules and regulations for such activities. The Board has, therefore, undertaken a programme of developing safety standards, safety codes, and related guides and manuals. While some of these documents cover aspects such as siting, design, construction, operation, quality assurance and decommissioning of nuclear and radiation facilities, other documents cover regulatory aspects of these facilities.

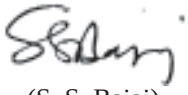
Safety codes and safety standards are formulated on the basis of nationally and internationally accepted safety criteria for design, construction and operation of specific equipment, structures, systems and components of nuclear and radiation facilities. Safety codes establish the objectives and set requirements that shall be fulfilled to provide adequate assurance for safety. Safety guides and guidelines elaborate various requirements and furnish approaches for their implementation. Safety manuals deal with specific topics and contain detailed scientific and technical information on the subject. These documents are prepared by experts in the relevant fields and are extensively reviewed by advisory committees of the Board before they are published. The documents are revised when necessary, in the light of experience and feedback from users as well as new developments in the field.

This safety guide provides guidance on process for identification, development and publication of the regulatory safety documents. This revised guide supersedes the earlier 2001 edition titled 'Codes, Standards and Guides to be prepared by the Regulatory Body for Nuclear and Radiation Facilities'.

Consistent with the accepted practice, 'shall' and 'should' are used in the guide to distinguish between a firm requirement and desirable option respectively. Appendices are an integral part of the document, whereas Annexures are included to provide further information on the subject that might be helpful to the user.

This revised guide has been prepared in-house by a working group of AERB officers. It has been reviewed by experts and the Advisory Committee on Code and Guides on Governmental Organisation for Nuclear and Radiation Facilities (ACCGORN).

AERB wishes to thank all individuals and organisations who have prepared and reviewed the document and helped in its finalisation. The list of persons, who have participated in this task, along with their affiliations, is included for information.



(S. S. Bajaj)
Chairman, AERB

DEFINITIONS

Applicant

Any person who applies to the competent authority for consent to undertake any of the actions for which the consent is required.

Approval

A type of regulatory consent issued by the regulatory body to a proposal.

Atomic Energy Regulatory Board (AERB)

A national authority designated by the Government of India having the legal authority for issuing regulatory consent for various activities related to the nuclear and radiation facility and to perform safety and regulatory functions, including their enforcement for the protection of site personnel, the public and the environment against undue radiation hazards.

Authorisation

A type of regulatory consent issued by the regulatory body for all sources, practices and uses involving radioactive materials and radiation generating equipment.

Carrier

An individual, organisation or government, undertaking the transport of radioactive material by any mode of transport. The term includes both carriers for hire (known as contract carriers) and carriers on own account (known as private carriers).

Commissioning

The process during which structures, systems and components of a nuclear or radiation facility, on being constructed, are made functional and verified to be in accordance with design specifications and found to have met the performance criteria.

Competent Authority

Any official or authority appointed, approved or recognised by the Government of India for the purpose of implementing Rules promulgated under the Atomic Energy Act, 1962.

Consent

A written permission issued to the "consentee" by the regulatory body to perform specified activities related to nuclear and radiation facilities. The types of consents are 'licence', 'authorisation', 'registration' and 'approval', and will apply according to the category of the facility, the particular activity and radiation source involved.

Consignee

Any individual, organisation or government which receives a consignment.

Consignor

Any individual, organisation or government, which presents a consignment for transport, and is named as consignor in the transport documents.

Construction

The process of manufacturing, testing and assembling the components of a nuclear or radiation facility, the erection of civil works and structures, the installation of components and equipment and the performance of associated tests.

Decommissioning

The process by which a nuclear or radiation facility is finally taken out of operation in a manner that provides adequate protection to the health and safety of workers, the public and the environment.

Design

The process and results of developing the concept, detailed plans, supporting calculations and specifications for a nuclear or radiation facility.

Nuclear Facility

All nuclear fuel cycle and associated installations encompassing the activities from the front end to the back end of nuclear fuel cycle processes and also the associated industrial facilities such as heavy water plants, beryllium extraction plants, zirconium plants, etc.

Nuclear Power Plant (NPP)

A nuclear reactor or a group of reactors together with all the associated structures, systems, equipment and components necessary for safe generation of electricity.

Nuclear Safety

The achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of site personnel, the public and the environment from undue radiation hazards.

Occupational Worker

Any person, working full time or part time in a nuclear or radiation facility, who may be employed directly by the “consentee” or through a contractor.

Operation

All activities following and prior to commissioning performed to achieve, in a safe manner, the purpose for which a nuclear/radiation facility is constructed, including maintenance.

Prescribed Substance

Any substance including any mineral which the Central Government may, by notification, prescribe, as being a substance which, in its opinion may be used for the production or use of atomic energy or research into matters connected therewith and includes uranium, plutonium, thorium, beryllium, deuterium or any of the respective derivatives or compounds or any other materials containing any of the aforesaid substances.

Radiation Facility

Any installation/equipment or a practice involving use of radiation-generating units or use of radioisotopes in the field of research, industry, medicine and agriculture.

Research Reactor

A critical/sub-critical assembly of nuclear fuel elements used for the purpose of research, teaching and production of radioisotopes.

Safety Code

A document stating the basic requirements, which must be fulfilled for particular practices or applications. This is issued under the authority of the regulatory body and mandatory to be followed by the respective utilities.

Safety Guide

A document containing detailed guidance and various procedures/ methodologies to implement the specific parts of a safety code, that are acceptable to the regulatory body, for regulatory review.

Safety Guidelines

A document providing safety requirements and guidance for particular practices or applications where a safety code has not been issued.

Safety Manual

A document detailing the various safety aspects/instructions and requirements relating to a particular practice or application, that are to be followed by a utility.

Safety Standard

A document similar to a safety code, elaborating upon the various technical requirements that must be met for a particular practice or application, so as to meet the requirements of the code.

Siting

The process of selecting a suitable site for a facility including appropriate assessment and definition of the related design bases.

Source

Anything that causes radiation exposure, either by emitting ionising radiation or releasing radioactive substances or materials.

Surveillance

All planned activities, viz. monitoring, verifying, checking including in-service inspection, functional testing, calibration and performance testing carried out to ensure compliance with specifications established in a facility.

CONTENTS

1. INTRODUCTION

1.1 General

For carrying out the regulatory and safety functions envisaged in the Atomic Energy Act, 1962 and the Rules framed there under, AERB was constituted in 1983. The Chairman of AERB has been notified as the "Competent Authority" to enforce these Rules. Apart from discharging the regulatory functions assigned to it in the above statutes, AERB also has to carry out additional functions that may be assigned to it in other national safety statutes issued from time to time. An overview of statutes is given in Annexure-I.

One of the functions of AERB is to issue safety codes, safety standards, safety guidelines, safety guides, safety manuals and technical documents for nuclear and radiation facilities and other related activities covered by the Atomic Energy Act, 1962 and as envisaged under AERB safety code on 'Regulation of Nuclear and Radiation Facilities' (AERB/SC/G). Accordingly, this safety guide on 'Development of Regulatory Safety Documents for Nuclear and Radiation Facilities' has been prepared. This guide should be used by AERB to identify and prepare such documents and streamline their contents. AERB regulatory safety documents[1] are issued following a three stage procedure: a) Proposal and preparation, b) Multi-tier review, c) Approval and publication.

1.2 Objective

The objective of this document is to provide guidance for the process of proposal, development and publication of regulatory safety documents in order to ensure that requisite coverage and quality is effectively achieved and maintained.

1.3 Scope

This safety guide covers the development process of safety codes, safety standards, safety guidelines/safety guides, safety manuals and technical documents to be issued by AERB for nuclear and radiation facilities.

[1] Regulatory safety documents mean safety codes, safety standards, safety guidelines, safety guides, safety manuals and technical documents.

2. CLASSIFICATION AND HIERARCHY OF REGULATORY SAFETY DOCUMENTS

2.1 Classification and Hierarchy

Regulatory safety documents issued by AERB are classified in the following decreasing order of hierarchy:

(a) Safety codes (red banded cover page)

(b) Safety standards (maroon banded cover page)

(c) Safety guidelines/guides (blue banded cover page)

(d) Safety manuals (dark green banded cover page)

(e) Technical documents (light green banded cover page).

Safety documents specifically safety codes, safety standards, and safety guidelines are required to emphasize the relevant safety fundamentals, establish the specific safety objectives and set requirements which shall be fulfilled to provide adequate assurance for safety.

2.1.1 Safety Codes and Standards

Safety codes and safety standards for each application or practice area are identified on the basis of National and International practices. The requirements covered in safety codes and safety standards are mandatory in nature. These documents specify the basic requirements to be met. 'Shall' statements/clauses are generally made in safety codes and safety standards to specify mandatory requirements.

Normally safety standards specify quantitative technical requirements on any particular aspect/practice/equipment.

Safety codes are issued by Board of AERB while safety standards are issued by Chairman, AERB.

2.1.2 Safety Guidelines and Safety Guides

AERB provides guidance through 'Safety Guidelines' on a particular subject, providing basic safety requirements and guidance for particular practices or applications in a single document where a safety code/standard has not been issued. This is approved by Chairman, AERB and contains mandatory requirements and guidance. Safety guidelines should be treated at par with safety standards in classification and hierarchy, as they contain safety requirements which are mandatory in nature and enforceable.

Methods of implementing safety requirements, provisions and features in a specific application area, which are recommendatory or suggestive in nature are contained in 'safety guides'. 'Should' statements/clauses are generally made in safety guides to describe the recommendations, unless the requirements are taken/reproduced from safety codes and safety standards which are of 'shall statements/clauses'.

The safety guide is a safety document containing detailed guidance and methodologies that are acceptable to AERB to implement the specific parts of a safety code/safety standard. This is approved by Chairman, AERB and is of recommendatory nature.

2.1.3 Safety Manuals

Safety manuals can be supplementary documents to help in fulfilling the requirements of the safety code and implementing the recommendations of safety guides. These are approved by Chairman, AERB.

2.1.4 Technical Documents

AERB publishes 'Technical Documents' which would contain scientific or technical information on certain topics of safety significance and/or regulatory concern.

Development of technical documents may not follow detailed multi-tier review hyphenate process as that of other documents (i.e. safety codes, safety standards, safety guidelines, safety guides, and safety manuals) as detailed in Section 4.

These are approved by Chairman, AERB after review by Advisory Committee. They are non mandatory in nature.

2.2 Unique Numbering of Regulatory Safety Documents

AERB regulatory safety documents are numbered with unique identification number for each document. This identification number captures the following information:

(i) Publishing agency, e.g. AERB

(ii) Type of facility (nuclear and radiation facilities), e.g. 'NRF' for nuclear and radiation facilities, 'NF' for nuclear facilities, 'RF' for radiation facilities, 'NPP' for nuclear power plants, 'NPP-PHWR' for nuclear power plants of pressurised heavy water reactor type, 'NPP-PWR' for nuclear power plants of pressurised water reactor type, 'RR' for research reactors, 'FCF' for fuel cycle facilities, 'FE-FCF' for front end fuel cycle facilities, 'BE-FCF' for back end fuel cycle facilities, 'RF-IRRAD' for irradiators belonging to radiation facilities etc.

(iii) Category of document, e.g. 'SC' for safety codes, 'SS' for safety standards, 'SG' for safety guidelines/safety guides, 'SM' for safety manuals, 'TD' for technical documents

(iv) Governing theme/areas of safety, e.g. 'G' for regulatory process, 'S' for siting, 'D' for design, 'O' for operation, 'IS' for industrial safety, 'CSE' for civil and structural engineering, 'DECOM' for decommissioning, 'MED' for medical, 'TR' for transport of radioactive material, 'IR' for industrial radiography, 'RW' for radioactive waste, 'RP' for radiation protection, 'EP' for emergency preparedness, 'FS' for fire safety etc.

(v) Serial number of regulatory safety documents under each classification/governing theme/areas of safety, e.g. 1, 2, 3, etc.

Each of the above abbreviations in unique number should be separated by a slash (/). The version of the document should be indicated by 'Rev.1'or 'Rev.2' etc., in parantheses after the number indicating the revision/issue number of the document.

Example for Numbering of Regulatory Safety Documents: AERB/NPP-PHWR/SC/D (Rev. 1) is indicating that the document is published by AERB dealing with pressurized heavy water reactor type nuclear power plants. The document is a safety code specifying requirements for design stage. Rev.1 indicates that it is issued once as a revised version.

3. SCOPE AND APPLICABILITY OF REGULATORY SAFETY DOCUMENTS

3.1 General

Regulatory safety documents present basic objectives, principles of safety, requirements, guidance, procedures and technical information in the development of atomic energy activities. These documents establish the requirements that should be met to ensure safety.

Safety codes are usually supplemented by safety guides and safety manuals.

These documents cover various stages or aspects of activities related to nuclear facilities listed below:

(i) Facility for mining and processing of radioactive ores and minerals

(ii) Uranium/thorium processing, rare earth plants and fuel fabrication plants

(iii) Heavy water plants

(iv) Research reactors, experimental reactors[2] and critical assemblies[3]

(v) Nuclear power plants

(vi) Facility for transport and storage of radioactive material

(vii) Fuel processing and spent fuel reprocessing plants

(viii) Radioactive waste management facilities

(ix) Plants for extraction, processing including isotopic enrichment of special radioactive material

(x) Facility for handling prescribed substances (e.g. Zirconium, Berellium)

(xi) Plutonium fuel fabrication plants.

The various stages consist of siting, design, construction, commissioning, operation and decommissioning.

Safety codes and safety standards for radiation facilities cover a wide spectrum of radiation sources, radiation generating equipment, equipment containing

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[2] A reactor primarily designed to supply neutrons or other ionizing radiation for experimental purposes.

[3] The smallest mass of a fissionable material that will sustain a nuclear chain reaction at a constant level.

radioactive sources and packages for transport of radioactive material. These include the following:

(a) Land based high intensity gamma radiation processing plant

(b) High energy particle accelerators used for research and industrial applications

(c) Neutron generators

(d) Facilities engaged in the commercial production of radioactive material or radiation generating equipment

(e) Telegamma radiotherapy

(f) Computed tomography unit

(g) Interventional radiological X-ray unit

(h) Equipment for industrial radiography, brachytherapy, nuclear medicine and gamma irradiation chambers.

The Bureau of Indian Standards (BIS), the International Electrotechnical Commission (IEC), the International Organization for Standardisation (ISO), the American National Standards Institute (ANSI), Deutsch Industrie Normen (DIN), World Health Organisation (WHO) etc. issue standards specifying the requirement for design of sources, equipment or devices to ensure their safety during use. AERB may adopt such standards or may develop additional regulatory safety documents for use in the country.

3.2 Safety Codes and Safety Standards

3.2.1 Safety Codes and Standards for Nuclear Facilities

Safety codes and safety standards are meant to spell out in detail the safety requirements to be complied by the Applicant/Consentee at all stages of activities of nuclear facilities such as siting, design, construction, commissioning, operation and decommissioning. Safety assessment for any stage would be based on satisfactory fulfillment of such requirements by the Consentee for granting regulatory consents (license or authorization) as applicable.

3.2.2 Safety Codes and Safety Standards for Radiation Facilities

Safety codes and safety standards spell out requirements for radiation facilities for their siting, design (e.g designing an equipment or device incorporating a radiation source either manufactured in the country or imported), commissioning, operation and decommissioning. They also set requirements for satisfactory compliance with regard to the adequacy of built-in safety features and prescribed tests for the equipment or device for type approval. Submissions by Applicants and safety assessment for any stage would be

based on satisfactory fulfillment of such requirements by the Consentee for granting regulatory consents (licence, authorization, registration and approval) as applicable. For example the safety code for 'Safe Transport of Radioactive Materials' stipulates the regulatory requirements for use by the consignee, consignor and carrier, whereas the safety standards for transport of radioactive materials stipulate the requirements for the design of the package for use by the designer. The document stipulates the provisions for packaging, marking, labeling, forwarding and handling-in-transit and testing of a transport package including transport of fissile materials and transport of spent fuels under special arrangement.

3.3 Safety Guidelines

AERB, sometimes, provides guidance and requirements through 'Safety Guidelines' where a corresponding safety code is not issued on a particular practice or application. Examples are the set of AERB safety guidelines issued for preparation of on-site and off-site emergency preparedness plans for nuclear and non-nuclear installations.

3.4 Safety Guides

Safety guides give guidance about how safety requirements could be complied by the Applicant/Consentee and enforced by AERB. The methodologies given in the safety guides are only suggestive and the user of the safety guide may choose to adopt any other methodology to achieve the desired intent. If utilities adopt a different methodology, they should meet the desired intent.

3.5 Safety Manuals

Safety manuals are expected to describe procedures for implementation of requirements specified in corresponding safety codes(s) and/or recommendations made in safety guide(s). They elaborate specific aspects of recommended/accepted practices, procedures, forms, formats and sometimes checklists.

3.6 Technical Documents

These reports contain information on wide ranging topics of safety significance in one or more application areas of regulatory concern. They contain detailed scientific and technical information, formulae, instructions, data, computational methods, safety research, data collection & analysis, developments in regulatory processes etc.

3.7 General Nature and Contents of Regulatory Safety Documents

The 'General nature and contents of regulatory safety documents' is detailed in Appendix-A.

4. DEVELOPMENT OF REGULATORY SAFETY DOCUMENTS

4.1 General

A multi-tier review system should be followed to develop regulatory safety documents. Members of all these committees are nominated so as to ensure that expertly written, unbiased and transparent documents are prepared, which can be implemented under Indian conditions and be consistent with current international practices. In addition to specialists from AERB, suitable experts from DAE units, academic institutes, national research laboratories, Central/ State government departments etc. are nominated in the AERB committees.

The preparation of AERB safety document is normally carried out in two stages:

(i) Identification of safety document through preparation, review and approval of safety document development proposal (SDDP)

(ii) Development of the document which includes draft preparation, review and approval.

4.2 Proposal for Development of New Documents and Revision of Existing Documents

A new document to be developed or revision of existing document is identified based on:

(a) an outcome of discussion/safety reviews,

(b) requirements felt necessary during consenting process,

(c) requirements felt during enforcement of regulations,

(d) new regulatory and technological developments,

(e) international practices,

(f) how the safety requirements and provisions of codes and standards are met,

(g) specific aspects of recommended/accepted practices, and

(h) feedback from nuclear and radiation facilities.

Once the document is identified for preparation/revision, the SDDP should be initiated as per procedure given below:

4.2.1 Safety Document Development Proposal (SDDP)

The SDDP is prepared by the responsible officer (s) of concerned AERB division. The officer should coordinate the activities of SDDP after informing

Information & Technical Services Division (ITSD) of AERB which is responsible for development of regulatory safety documents. The identified responsible officer (s) should revise/update/ and submit SDDP subsequently after review by agencies.

Flow diagram for the process of safety document development proposal is given in Annexure-II.

The SDDP prepared by the concerned division should include the following:

(a) General [Proposed title, Category, Proposed document No., Proposed action, Related documents, Review committees and Responsible AERB Officer(s)]

(b) Introduction

(c) Justification of the need for development of the proposed document

(d) Interfaces/reference material to be used

(e) Suggested contents of document

(f) Suggested agency (i.e. AERB official/s, consultant/s or group of experts) to produce draft document

(g) Time schedule for preparation.

A typical format of SDDP is given in Annexure-III.

4.2.2 Review of SDDP in AERB Divisions

The SDDP prepared should be submitted to the ITSD, AERB by the concerned division. After checking for completeness, the copies of SDDP are circulated to the other divisions of AERB, for review, within a time frame. The divisions should review the SDDP and give comments with respect to need for the preparation/revision of the document, reference documents to be used, contents of the document and suggested agency. The disposition of the review comments is carried out by the identified responsible officer/s. The revised SDDP along with the disposition of comments is submitted to the relevant advisory committees for review and recommendations.

4.2.3 Review by Relevant AERB Advisory Committee

The revised SDDP along with the disposition of comments is reviewed by relevant AERB Advisory Committee. The committee gives recommendations with respect to need for the preparation/revision of the document, reference documents to be used, contents of the document and suggested agency. The typical list of Advisory Committees is given in Annexure-II. The further revised SDDP along with the recommendations is submitted to relevant Apex committee for review and recommendations.

4.2.4 Review by Apex Committee

The revised SDDP is reviewed by relevant AERB Apex committee. The committee gives recommendations with respect to need for the reparation/ revision of the document, reference documents to be used, contents of the document and suggested agency. The typical list of Apex committees is given in Annexure-II.

4.2.5 Approval by Chairman, AERB or AERB Board

Based on the final SDDP along with the recommendations, approval should be sought from Chairman, AERB for development of all regulatory safety documents other than safety codes. Board approval should be sought for development of safety codes.

4.2.6 Constitution of Agency for Development of the Safety Document

A Working Group should be constituted/ in house group should be constituted/ contract should be awarded to a consultant as per established procedure for development of the document. This identified agency is responsible for preparation, revision and updating of the draft throughout the process of its development.

4.3 Development of Regulatory Safety Documents

Development of a safety document is carried out in three stages:

(i) Preparation of initial draft

(ii) Review

(iii) Approval and issuance.

4.3.1 Preparation

The identified agency/working group prepares the initial draft in accordance with the approved SDDP. This draft is designated as R-0. R-0 draft is processed/ worked upon (debated, discussed, modified) in working group, which results in R-1 draft.

4.3.2 Review

4.3.2.1 Review by Relevant Advisory Committee

An "Advisory Committee" which consists of experienced senior specialists in the relevant field(s) reviews this R-1 draft. A number of such Advisory Committees have been constituted and are functioning in parallel, for well-identified areas, e.g. for siting, design, operation and quality assurance of nuclear installations and for applications of radiation. The R-1 draft is reviewed by the relevant Advisory Committee. The committee reviews the document to:

(a) be in line with AERB requirements,

(b) be in line with corresponding safety code/safety standard ,

(c) ensure whether all issues are addressed,

(d) ensure whether present national/international practices are taken into consideration,

(e) ensure adequacy and correctness of contents, and

(f) ensure consistency with other AERB regulatory safety documents.

The agency preparing the document revises the draft based on the comments of the committee and brings out R-2 draft. The R-2 draft is circulated among identified experts in premier institutions for review.

4.3.2.2 Review by Experts and Disposition of Expert Comments in Advisory Committees

The comments are invited on the R-2 draft from the experts identified based on the expertise on the subject, heads of the relevant facilities, members of relevant advisory committees and directors/heads of AERB divisions. The experts are expected to technically examine the document from the point of view of (i) completeness of the document, (ii) correctness of information provided, (iii) information presented in a coherent manner, and (iv) national/ international practices so as to improve the quality of the document. The experts should be requested to give comments on the document within a specified period to expedite the development process.

Depending on the number and nature of comments and the complexity of the subject, the concerned agency preparing the document may compile (in presentable form), review and make disposition prior to the review by the advisory committee. The disposition of comments should be made by the advisory committee after review and the document be revised to make R-3 draft.

4.3.2.3 Technical Editing & Review by Apex/Advisory Committee

The R-3 draft along with disposition of experts' comments should be submitted to the Apex Committee for further review. In case of documents to be reviewed by Advisory Committee on Nuclear Safety, the draft should also be sent simultaneously to an identified technical editor who is also an expert in the field for editing. The technical editor should focus his review on the flow and clarity of language from the standpoint of unambiguous communication of technical contents to a reader.

The Apex committee further reviews the draft along with technical editor's comments. Members of Apex committees are so chosen that, collectively, they provide requisite expertise in all areas to be covered under their purview. The committee not only reviews the draft from the point of view of technical

accuracy and possibility for implementation, but also ensures harmonisation of all documents to be issued by AERB. Working group revises the draft based on the comments of the Apex committee and technical editor resulting in R-4 draft.

In case of regulatory safety documents to be reviewed by the other Committees in the areas such as regulatory process, fuel cycle facilities, industrial and fire safety, occupational health etc., only after review of R3 draft by the concerned Apex Committees, technical editing and copy editing of the document are taken up.

4.3.2.4 Copy Editing

Lastly, the edited draft undergoes professional copy editing primarily to improve the accuracy of English language to an internationally acceptable level. The R-4 draft is sent to the identified copy editor who is also an expert in the field for language editing. The draft is revised appropriately considering the copy editor's comments resulting in R-5 draft.

4.3.3 Approval by Chairman, AERB/Board

Chairman, AERB approves the R-5 draft as a final document.

4.4 Publication and Issue

The approved final version is printed and issued for implementation by concerned utilities. All published documents can be obtained from AERB on request. The published document should be put on AERB web site.

The responsible division for publication of the document should maintain the electronic form of the final document in editable form for further modifications during revision/reaffirmation. Technological obsolescence of the stored version should be appropriately considered during this process.

The simplified flow diagram representing the document development process is given in Annexure-IV. The Annexure also indicates typical Advisory committees/Apex committees.

4.5 Revision of Documents

The regulatory safety documents are revised as and when necessary in the light of experience and feedback from users as well as new developments in the field.

4.6 Coordinators for Published Regulatory Safety Documents

Identified AERB divisional coordinators should follow up all published documents to make sure that the documents are meeting the current state of art. Divisions of AERB, coordinating a particular safety document should initiate, when necessary, safety document development proposals to take up revision.

APPENDIX-A

GENERAL NATURE AND CONTENTS OF REGULATORY SAFETY DOCUMENTS

The general nature and contents of regulatory safety documents should be as follows:

A.1 General Guidance

A.1.1 Copyright Permission

Written permission to reproduce information such as tables, figures, empirical formulae printed under copyright in non-AERB publications should be obtained from the copyright holder at an early stage of manuscript preparation. Acknowledgement of the source should be included.

A.1.2 Formatting of Page

A line should separate each paragraph and sub-paragraph.

Proper formatting of each paragraph should be ensured with single line spacing throughout the document. Use 'Justify' tab (both left and right).

For indenting of all paragraphs and sub-paragraphs in a subsection, one tab space should be given with reference to paragraph number in the left margin.

For formatting sub-items under a paragraph 'Left aligning' should be done.

For spacing sub-items under a paragraph, separating blank line should not be given between items.

A.1.3 Page Break

As far as possible, to facilitate reader, do not leave a single line in the previous page and continue the same paragraph in the next page. It is desirable to leave a blank line in the earlier page and start a paragraph in the next page.

A.1.4 Page Numbering

Pages from 'FOREWORD' to end of 'DEFINITIONS' should be numbered in Roman numerals e.g. (i), (ii)…. (x). The content page should not be numbered.

Section 1, 'INTRODUCTION' should start from odd page and each following section should start from a new page with its title on top. These pages from section-1 onwards should be numbered in Arabic numerals e.g. 1, 2, 3, etc. till the end of the document. The page number should be at the centre at the bottom of the page.

A.1.5 Footnotes

Footnotes should be indicated by raised Hindu-Arabic numbers. Footnotes only provide information that might be helpful to the user.

A .1.6 Abbreviations

All but universally familiar abbreviations should be introduced upon first use. Overuse of acronyms should be avoided. Terms should be written out in full if they are not often used.

Abbreviations used should be explained in its full form upon first use e.g., as low as reasonably achievable (ALARA), quality assurance (QA), responsible organization (RO) etc.,

A.1.7 Avoiding Unwanted Capital Letters

Unwanted capital letters should be avoided in abbreviations as well as in the text.

A.1.8 Punctuation/English

No bullet should be used in the document.

Wherever colon (:) is used at the end of a paragraph/sentence, followed by several items, punctuation should be used in the following way:

(i) If all the followed items are independent and in short, each item should start with an upper case and end with no punctuation mark. The last item here should end with a full stop.

Example:

The foundation system of a nuclear power plant consists of three important components:

(a) Foundation structures

(b) Engineered foundation supports

(c) Foundation materials as founding media (.)

(ii) If all the followed items are independent and are in sentences, each item should start with an upper case and end with full stop.

Example:

In order to ensure that the foundations of nuclear power plant buildings are capable of fulfilling safety related function and integrity requirements, the following safety aspects should be considered:

(a) The applied bearing pressure should not exceed the safe bearing capacity of the sub-grade material upon which the foundation is constructed (.)

(b) The foundation design should ensure that total and differential settlement due to compression of the underlying sub-grade are within acceptable limits, both for structure as well as the process system housed in it (.)

(iii) If it is a continuation of the paragraph/sentence preceding the colon (:), each item should start with a lower case and end with a comma (,) where a short pause is required to be given. The penultimate item should also end with a comma (,) followed by 'and'. A comma (,) should not be used after 'and'. The last bullet here should end with a full stop (.)

Example:

Select the design value of the parameter as the best estimate, using engineering judgment, from the estimates or range of the parameters determined from various investigations such that

(a) the design value is compatible to the site condition (,)

(b) conservative results are obtained from safety analysis using this value (,)

(c) adequate safety margins are provided (,) and

(d) the design value of one parameter does not contradict with the design values selected for other related parameters (.)

(iv) If it is a continuation of the paragraph/sentence preceding the colon (:), each item should start with a lower case and end with a semicolon (;) where a long pause is required to be given. The penultimate item should also end with a semicolon (;) followed by 'and'. A semicolon (;) should not be used after 'and'. The last item here should end with a full stop (.)

Example:

The behaviour of the soil is measured by:

(a) pressure cells, located at the soil-mat interface. The number must be such that they take into account the soil heterogeneities and non-uniform loading conditions (;) and

(b) deep settlement meters located in boreholes. These permit monitoring of the behaviour of different soil layers. If possible, they should be installed before excavation is begun.

Generally in the English grammar, a full stop (.) indicates a long pause. The hierarchy of other decreasing pauses are colon (:), semi-colon (;) and comma (,).

Words from British/UK English should be used (e.g. 'organisation' instead of 'organization', 'programme' instead of 'program', 'minimise' instead of 'minimize' etc.).

A.1.9 Numbering of Sections

Section, subsection and subsequent levels should be numbered in Hindu-Arabic numerals. No subsection should be paragraph numbered unless it is titled. However they may be numbered with serial number to facilitate proper referencing of the clauses at the time of usage.

Title of the section should be **in BOLD CAPITAL LETTERS** and centered.

Title of the subsection with one decimal should be in title case in bold letters.

Title of sub subsection with two decimals should be in title case with normal letters (not in bold).

Title of sub subsection with three decimals should be in title case with normal italic letters (not in bold).

Underlining should be avoided. To focus attention**,** *italics* and/or bold may be used.

Too many sub-sub-sections are generally not preferred.

A.1.10 Tables and Figures

Tables should be numbered (in upper case Roman numerals) and figures should be numbered (in Arabic numerals) in the order in which they are first mentioned and each should have a heading typed in upper case letters.

Tables and figures should appear in relevant sections in the text

Tables should be created using the 'column' function or the tab key (not the space bar) to separate columns.

Any text typed inside the column of the table should be left and right justified.

Tables should be numbered continuously with Roman numerals.

Figures, equations and foot notes should be numbered with Hindu-Arabic numerals.

Tables and figures should be ensured to be legible after reduction to final page size, viz. as applicable to safety codes, safety standards, safety guidelines, safety guides, safety manuals and technical documents.

It should be ensured that Tables be individually titled, figures be individually captioned, and that headings and captions are accurate and adequate. All titles of tables and captions of the figures should be in bold capital letters. The titles of the Tables should appear on the top of each table and the captions of the figures should appear at the bottom of each figure.

Figures should be prepared such that printing quality is improved or alternately a scanner may be used for preparation of the figures.

A.1.11 Mathematical Equations

The equations should be numbered. Mathematical symbols should be typed clearly and consistently to ensure that their meanings and positions are unambiguous.

For mathematical equations, involving 'integral/differential operators and other symbols', the package 'equation editor' or equivalent may be used.

A.1.12 Units of Measurement

All quantities should be expressed in SI units in a standard way. e.g. kg but not Kg or Kgs.

Where non-SI units have to be retained, these should be given in parentheses after the equivalent SI quantities. Alternatively, a conversion factor may be given (e.g. as a footnote to a table of non-SI measurements).

A.1.13 Structure

The title headings should accurately describe the contents of the individual sections and sub-sections and show the logical development of the text; and sequencing of sections leading to gradual flow of ideas. The flow of ideas should be such that the reader understands the subject clearly after the first reading and should be in a position to utilise the document for the intended purpose. There should be subsections such as General, Objective, Scope and Structure (structure is desirable but not mandatory) of the document in the first section titled 'Introduction'. Each 'Chapter' should be named as 'Section'.

Separate pages should be used for the following: Title (starts on odd page); Foreword (starts on odd page); Definitions (start on odd page); Contents (starts on odd page); Section 1 (starts on odd page); Appendices; Annexures; References; Bibliography; List of Participants as applicable viz. Contributors for Draft Document Preparation; Working Group: Dates of meeting, Members and Invitees of Working Group; Advisory Committee: Dates of meeting, Members and Invitees of Advisory Committee; Apex Committee: Dates of meeting, Members and Invitees of Apex Committee; List of Regulatory safety documents in the Series.

Headings and subheadings should accurately describe the contents of the individual sections and subsections and should show the logical development of the text. Successive sections and paragraphs should be logically related.

The text should not duplicate extended passages from other regulatory safety documents. Instead, a reference should be made to the original source.

A.2 Specific Guidance

A.2.1 Category

The category of the document viz. safety code, safety standard, safety guidelines, safety guide, safety manual or technical document should be clearly indicated with safety document No. as: AERB/Utility/(SC/SS/SG/SM/TD)/ followed by S.No.of the series at the right hand top corner and bound portion of the cover page and top central portion of the first inner page. Example AERB/NPP/SG/QA-3.

A.2.2 Cover Page (Title Page) Front

The title on the cover page should be explicit, accurate and consistent with the category and scope of the document and with related documents in the application/ subject area. In the title, no text should be written in parentheses [e.g. 'Vapour Suppression System (Pool Type) for Pressurised Heavy Water Reactor', AERB/SG/D-22].

A.2.3 First/Second Inner Page

The first inner page should bear the document reference number on top in the middle (font size 10 pt), title of the document in the middle (font size 12 pt.) both in capital letters, Atomic Energy Regulatory Board, Mumbai - 400 094, India (in upper/lower case) at the bottom of the page (font size 10 pt) in bold letters and followed by month and year of issue in upper/lower case on lower portion in bold letters (font 10 pt.).

In case of safety codes, the date of approval by the Board should also be mentioned between the title and Atomic Energy Regulatory Board (in upper/ lower case) in bold letters.

On the first inner page, date of issue should be written without any comma after the month (e.g. 'February 2013').

The second inner page should bear the price (if applicable) at the centre and at the bottom the full address (in bold upper/lower case) from where the document can be procured.

On the second inner page acknowledgements for permissions obtained from outside agencies should be mentioned on the top portion.

A.2.4 Foreword

All documents should contain a standard foreword which should clearly indicate the purpose of the document. The third inner page i.e. page (i) should start with the Foreword and it may go up to fourth page, else the page should be left blank.

Foreword should not include bibliographical references or dedications. However, acknowledgements may be made in a final paragraph to bodies that provided assistance.

A.2.5 Definitions

List of Definitions should start from fifth inner page onwards (generally on page iii). The 'technical terms' should be in upper/lower bold letters and the definitions should be given below the respective terms alphabetically. Special definitions, if any, should be provided subsequent to the list of definitions.

Terms, which have special significance and appear in the Safety Document, shall be defined. The definitions should be consistent with definitions published by AERB (AERB/SG/GLO).

All the definitions used in the regulatory safety documents should be approved/ normalised by Glossary Review Committee (GRC). Member-Secretaries of the respective Working Groups or Advisory Committees should forward the new definitions used by the Working Groups for preparation of different AERB safety codes/ safety standards/ safety guidelines/ safety guides/ safety manuals/ technical documents etc. to the GRC, as applicable, well in advance at the draft R-0 stage of the document for normalisation. Member-Secretary of working group for preparation of AERB document should ensure that all definitions are approved by GRC at the draft stage before putting up to Advisory Committee.

The Working Groups should incorporate the normalized definitions in the draft R-1 of the document, before submission of the same to Advisory Committees/Apex Committees.

Definitions should follow the Foreword, should not bear any section number and should be listed in alphabetical order. Thereafter, the definitions/terms appearing in only a particular safety document should be mentioned under 'Special Definitions (Specific to the Present Document)' in that document. Such definitions need not be reviewed by GRC. If only a few special definitions (may be less than ten in number or a page) are there, these should be explained/defined in the text itself at the first place these appear in the document or as footnotes in the relevant page of the document.

Terms defined in the definitions should appear in the text of the main document.

A.2.6 Contents Page

The ‘contents page’ should follow ‘Definitions’ section. The title ‘Contents’ should be in bold capital letters at the top in the centre of the page. The ‘Contents’ should always start on a fresh odd numbered page. Contents pages should not be numbered. It should contain in normal capitals in font 12 the S.No. and title of the section as used in the text with the corresponding page number on the right side. Titles of main subsections in normal title case in font 10 as used in the text with the corresponding page number on the right side should also be included. Sub-subsections of second decimal and beyond should not be included in the contents.

S.No. and titles of Appendices, Annexures, References, Bibliography, List of participants, Working Group, Advisory Committee in full form, Apex Committee in full form and Provisional list of related safety code, safety standards, safety guidelines, safety guides, safety manuals and technical documents should also be listed at the end in capital letters.

A.2.7 Introduction

The ‘Section 1: Introduction’ should follow the ‘contents page’ and should always start from right page (odd page number) and each of the following section should start from a new page with section titles on top in capital letters.

“1. Introduction” should be Section-1 of any Safety Document and should consist of the following sub-sections.

1.1 General

This sub-section should always start with 1.1 and gives the background information on the subject.

1.2 Objective

This sub-section should always start with 1.2. The purpose and rationale of the document can be included here.

1.3 Scope

This sub-section should always start with 1.3. In this sub-section the document should clearly mention the facilities for which it is applicable. It can include the extent of coverage and as appropriate a statement of what is not covered by the document.

A.2.8 Other Sections

After ‘Section 1’ other sections should follow. Each section should start at the beginning of a new page. No abbreviations should be used in the titles of sections.

A.2.9 Appendi(x)ces

Appendix whenever used for elaboration is considered a part of the document and should be placed after the last section in the main body of the document. Appendices may be numbered as A, B, C etc. The subsections in Appendices may be numbered as A.1, A.2 etc. or B.1, B.2 etc. or C.1, C.2 etc. to have unique numbers for subsections without conflicting with the numbers of subsections of the main text or other Appendi(x)ces or Annexure(s).

A.2.10 Annexures

Annexures provide information that might be helpful to the user.

Annexures should be placed after 'Appendices' as they do not form a part of the document. Aneexure(s) may be numbered as Annexure(s)- I, II, III etc. The subsections in Annexure(s) may be numbered as I.1, I.2 etc. or II.1, II.2 etc. or III.1, III.2 etc. to have unique numbers for subsections without conflicting with the numbers of subsections of the main text or other Appendi(x)ces or Annexure(s).

A.2.11 References

This subsection should contain type of reference material such as IAEA publications, NEA publications etc. used during development process. Only those references cited in the text should appear here. The status of the referenced document should also be indicated, if not published.

References are indications to the reader about the authority of statements in the text or the sources of information on particular points. The accuracy of references affects both the credibility and the reputation of AERB publications.

References should be retrievable (not private communications, unpublished work or internal documents) and the information given should be accurate and complete. Titles of conference proceedings, names and locations of their publishers, and year of publication are useful.

References should be listed under 'references page' sequentially as they appear in the text. References should be listed (headed REFERENCES) after Appendices and Annexures, for all the main text including the Appendices and should be keyed to the text with Hindu-Arabic numbers [1, 2,3,...] in square parentheses in the order in which first they appear in the text. Reference numbers should be typed on the same line (but not as superscripts) as e.g. [1]; for several references together as [2–5]

Caution should be exercised in citing the AERB's hierarchical publications. Safety code shall not cite safety guides and safety manuals as references. Safety guides should not reference documents that present material of a tentative nature or in a provisional or preliminary form.

Wherever other AERB documents are quoted in the text, the titles of such documents should match exactly with the titles of already published or proposed documents. The document number should be given in parentheses, after the title e.g. AERB Safety Code 'Design of Pressurised Heavy Water Reactor Based Nuclear Power Plants' [AERB/NPP-PHWR/SC/D (Rev. 1); 2009].

If AERB guides are listed in references, the full form of AERB as ATOMIC ENERGY REGULATORY BOARD followed by the title of the document followed by number of the document with year of publication should be followed.

A.2.11.1 Reference List Format:

Indicate author's family name first, typed in CAPITAL LETTERS, should be followed by author's initials.

Then the title of the article from the book, or report or journal should be written in title case. All journal articles are enclosed in single quotes.

Next the name of the book in title case or report or the abbreviated name of the journal should be written.

If the article is from the proceedings of a conference, the title of the conference should be given; next the volume number and volume editor's name (if any) should be given.

If the reference cited is a report, the report number (if any) should follow the report title.

Then the name of the publisher (for a book) or the institution(for a report) should be provided followed by the place of publication.

Finally, the page numbers of the article (wherever appropriate) should be given, followed by the year of publication.

A.2.11.2 Examples of References based on Above Format:

(1) INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION, 'Evaluation of Radiation Doses to Body Tissues from Internal Contamination due to Occupational Exposure', Publication 10, Pergamon Press, Oxford and New York (1968)

(2) INTERNATIONAL ATOMIC ENERGY AGENCY, 'Code on the Safety of Nuclear Power Plants: Design', No. 50-C-D, IAEA, Vienna (1988).

(3) ATOMIC ENERGY REGULATORY BOARD, 'Code on the Safety of Nuclear Power Plants: Operation', No. AERB/SC/O, Mumbai, India (1988).

(4) ARGONNE NATIONAL LABORATORY, 'Environmental Effects Research', Rep. ANL-83-100, Argonne, IL (1984).

(5) KARSTAD, L.H., ET AL., 'Report to the Government of Kenya on Wildlife Disease Research', Rep.TA3291, FAO, Rome (1974).

(6) KRUSENAN G.P., 'Analysis and Evaluation of Pumping Test Data', IILRI, The Netherlands, pp377, (1990).

A.2.12 Bibliography

Bibliography should come after References.

For the benefit of reader, some documents, which are not referred in the text, can be given under the heading **'BIBLIOGRAPHY'** if necessary.

A bibliography for background reading, i.e. whose entries need not be cited in the text, should be set out as in references and put in alphabetical order by author/agency. References by the same author/agency should be listed chronologically, with the earliest reference first.

A.2.13 List of Participants

List of Participants and Committees with dates of meeting etc. should come after References and Bibliography.

List of Participants as applicable viz. Contributors for Draft Document Preparation; Working Group: Dates of meeting, Members and Invitees of Working Group; Advisory Committee: Dates of meeting, Members and Invitees of Advisory Committee; Apex Committee: Dates of meeting, Members and Invitees of Apex Committee should be mentioned in separate pages. 'Dates of Meetings' should be written as 'Dates of meeting'. Proper titles of Working Group/Advisory Committee/Apex Committee in full form should be given.

Designations of the participants should not be mentioned. Only the affiliation of the participants should be mentioned. For all retired members instead of using 'Formerly', word 'Former' is preferred. The abbreviated full form of NPCIL should be used instead of NPC. IIT, Bombay should not be written as IIT, Mumbai.

A.2.14 List of Regulatory Safety Documents Published

List of documents relevant to subjects should come last, after list of participants. In the provisional list of safety code, safety guidelines, safety guides, safety manuals and technical documents in the particular series of the topic under consideration, all titles of the as published or as decided documents should be given e.g. the title of AERB/SG/D-14 is 'Control of Air-borne Radioactive Materials in Pressurised Heavy Water Reactors'.

A.2.15 Last Cover Page

The document's reference number in white capital letters in reverse printing (font 10 pt. for safety codes, safety standards, safety guidelines and safety guides, and 12 pt. for safety manuals and technical documents) should be printed on the respective document's back cover page centre strip.

Publisher's address in pt 10 as given below will be printed in black letters in the yellow strip on the back cover of document.:

Published By : Atomic Energy Regulatory Board
Niyamak Bhavan, Anushaktinagar
Mumbai - 400 094
INDIA.

Abbreviated or short name of printer/press (in pt 9 or smaller) in black letters should be printed in the right hand side bottom portion of the yellow strip on the back cover of the document.

ANNEXURE-I

OVERVIEW OF STATUTES

I.1 General

Nuclear and radiation safety in the country is enforced by AERB by virtue of provisions of the relevant sections of Atomic Energy Act, 1962 and the Rules and surveillance procedures issued under the enabling provisions of the Act. Industrial safety in the Department of Atomic Energy establishments is ensured by implementation of Atomic Energy (Factories) Rules, 1996 based on provisions of the Factories Act, 1948 and its enforcement.

I.2 Acts

The safety provisions of Atomic Energy Act, 1962, relevant to the applicant intending to set up and operate a nuclear or radiation facility are:

(i) Section 16: This empowers the Central Government to prohibit the handling of radioactive substances without its written consent.

(ii) Section 17: This empowers the Central Government to frame Rules to prevent radiation injuries at work places, to safely dispose off radioactive wastes, to ensure appointment of qualified persons, to ensure structural safety of buildings, to ensure safety in transportation of radioactive substances, to authorise persons to inspect premises etc..

(iii) Section 23: This empowers the Central Government to administer the provisions of Factories Act, 1948 in the Central Government factories engaged in activities related to Atomic Energy.

I.3 Rules

Under the enabling provisions of various sections of the Atomic Energy Act, 1962, the following Rules have been issued so that AERB can carry out its functions and ensure safety in the specific application (activity) areas:

(i) Atomic Energy (Radiation Protection) Rules, 2004 (Under Section 30)

(ii) Atomic Energy (Working of Mines, Minerals and Handling of Prescribed Substances) Rules, 1984. (Under Sections 14 & 30)

(iii) Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987. (Under Sections 17 & 30)

(iv) Atomic Energy (Rediation Processing of Food and Allied Products) Rules, 2012.

(v) Atomic Energy (Factories) Rules, 1996. (Under Sections 23 & 30)

These Rules stipulate the safety requirements to be complied with by the licensee, and the enforcement measures to be taken by AERB, such as safety assessment, issue of regulatory consent, verification of compliance with statutory provisions through inspections, taking of punitive action for violations etc. Some of the Rules also include formats for application for consent, issue of consent, reporting etc.

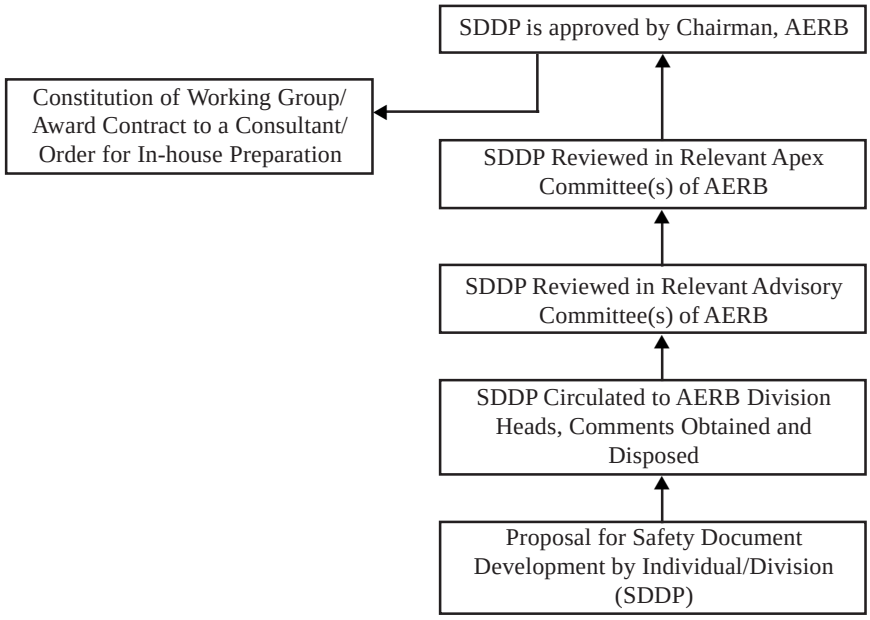
I.4 Surveillance Procedures

Rule 27 of Atomic Energy (Radiation Protection) Rules, 2004 provides for the issue of surveillance procedures appropriate to the use of radiation and disposal of radioactive material and for the Applicant/Consentee to comply with the same. This Rule also stipulates that these procedures may provide that the radiation installation shall be planned, and approved by the Competent Authority. The working conditions shall be approved prior to routine operation such as, personnel monitoring of workers, medical examination of radiation workers, maintenance of records of individual doses, inventory of sources, results of area monitoring, transport of radioactive material in public domain, quality assurance and any other data specified by the Competent Authority.

Surveillance procedures specify that the competent authority may issue safety codes in which specific details in respect of any particular activity are specified and compliance with the code is mandatory.

ANNEXURE-II

FLOW DIAGRAM FOR PROCESSING SAFETY DOCUMENT DEVELOPMENT PROPOSAL



AERB Advisory and Apex Committees

ACNS	:	Advisory Committee on Nuclear Safety (Apex)
ACRS	:	Advisory Committee on Radiation Safety (Apex)
ACCGORN	:	Advisory Committee for Codes, Guides & Manuals for Governmental Organisation(Advisory and Apex)
ACIFS	:	Advisory Committee on Industrial and Fire Safety (Advisory and Apex)
ACOH	:	Advisory Committee on Occupational Health (Advisory and Apex)
ACSDFCF	:	Advisory Committee on Safety Documents relating to Fuel Cycle Facilities other than Nuclear Reactors (Advisory and Apex)
ACRDS	:	Advisory Committee for Regulatory Documents on Safety in Nuclear Power Plant Siting
ACCGD	:	Advisory Committee for Codes, Guides & Manual for Safety in Design of Nuclear Power Plants
ACCGASO	:	Advisory Committee for Codes, Guides & Manual for Safety in Operation of Nuclear Power Plants
ACCGQA	:	Advisory Committee for Codes, Guides & Manual for Safety in Quality Assurance of Nuclear Power Plants
ACRDCSE	:	Advisory Committee for Regulatory Documents on Civil and Structural Engineering
ACSDRW	:	Advisory Committee for Preparation of Safety Documents on Radioactive Waste Management
SCRRRSD	:	Standing Committee for Review and revision of AERB's Radiation Safety Documents

ANNEXURE-III

TYPICAL FORMAT OF SAFETY DOCUMENT DEVELOPMENT PROPOSAL

For each manuscript proposed for preparation of safety document, the Safety Document Development Proposal should be prepared as per the format given below:

1. GENERAL

Proposed title	:	*(Full title proposed)*
Category	:	*(Safety Code/ Safety Guide/ Safety Manual/ Technical Documents)*
Proposed Document No.	:	
Proposed Action	:	*(new publications, revision, combination etc.)*
Related Documents	:	*(corresponding relevant documents)*
Review Committees	:	*(Relevant advisory and Apex committees)*
Responsible AERB Officers	:	*(Name(s) of AERB officer(s) responsible)*

2. INTRODUCTION *(Brief account of the background to the manuscript)*

3. JUSTIFICATION *(Rationale for development or revision of safety document)*

4. INTERFACES/REFERENCE MATERIAL TO BE USED *(List of documents from where inputs can be taken)*

5. CONTENTS

   5.1 SCOPE

   5.2 TABLE OF CONTENTS (PROPOSED)

   (Guidance on content of the manuscript to assist the drafting group, such as a summary of the scope of the manuscript, together with any particular points that should be borne in mind while drafting. The outline of the section headings should also be given. This section should be kept brief; if there is more detailed information available, e.g. an outline of section headings, it could be added as an annex to the SDDP.)

6. SUGGESTED AGENCY TO PRODUCE DRAFT DOCUMENT:

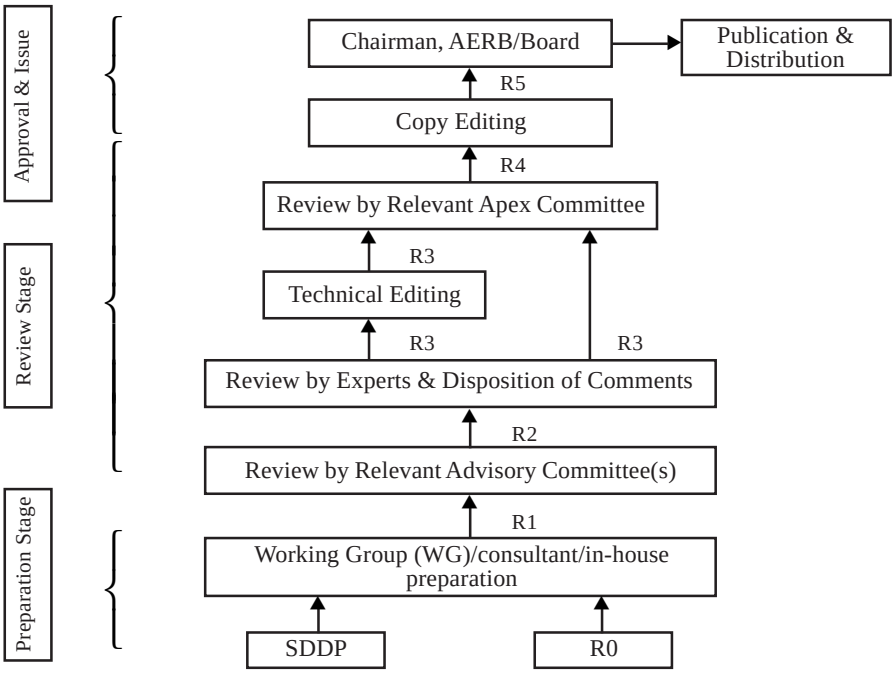
   (In-house preparation by AERB official/s, consultant/s or working group of experts as the case may be).

7. PRODUCTION TIME SCHEDULE - *(Outline time table for identification, preparation, review and approval of the documents)*

	IDENTIFICATION	DATE
1.	Submission of SDDP & Comments by AERB	:
2.	Submission of SDDP to Advisory Committee	:
3.	Comments from Advisory Committee	:
4.	Final SDDP and approval	:
	PREPARATION	
5.	Formation of working group/award of contract to consultant, formation of in-house group	:
6.	Preparation and submission of first draft R-1	:
	REVIEW	
7.	Review of R-1 by Advisory Committee	:
8.	Submission of Revised draft R-2 for experts' comments	:
9.	Submission of expert comments and disposition by Advisory Committee	:
10.	Submission of revised draft R-3 for Technical editing and Review by Apex committee	:
11.	Submission of revised draft R-4 for copy editing	:
	APPROVAL	
12.	Submission of revised draft R-5 for approval by Chairman, AERB/Board	:
	PUBLICATION	
13.	Publication of document	:
	Total Period	=

ANNEXURE-IV

FLOW CHART FOR DEVELOPMENT OF REGULATORY SAFETY DOCUMENTS



AERB Advisory and Apex Committees

ACNS	:	Advisory Committee on Nuclear Safety (Apex)
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ACSDFCF	:	Advisory Committee on Safety Documents relating to Fuel Cycle Facilities other than Nuclear Reactors (Advisory and Apex)
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ACCGD	:	Advisory Committee for Codes, Guides & Manual for Safety in Design of Nuclear Power Plants
ACCGASO	:	Advisory Committee for Codes, Guides & Manual for Safety in Operation of Nuclear Power Plants
ACCGQA	:	Advisory Committee for Codes, Guides & Manual for Safety in Quality Assurance of Nuclear Power Plants
ACRDCSE	:	Advisory Committee for Regulatory Documents on Civil and Structural Engineering
ACSDRW	:	Advisory Committee for Preparation of Safety Documents on Radioactive Waste Management
SCRRRSD	:	Standing Committee for Review and revision of AERB's Radiation Safety Documents

LIST OF PARTICIPANTS

WORKING GROUP

Dates of meeting	:	March 5 & 20, 2009 April 17 & 29, 2009 May 22 & 29, 2009 June 5 & 18, 2009 July 10, 20, 24 & 31, 2009 September 4 & 14, 2009

Members of the Working Group:

Shri Y.K. Shah (Convener)	:	AERB
Dr. R.M. Nehru	:	AERB
Shri J. Koley	:	AERB
Shri R.P. Gupta	:	AERB
Shri R.K. Singh	:	AERB
Shri Ajai Pisharady	:	AERB
Shri H.K. Kulkarni	:	AERB
Smt V. Anuradha (Member-Secretary)	:	AERB

Reviewed and Redrafted:

Smt P. Shylamoni	:	AERB
Shri N.G. Asokan Pillai	:	AERB
Shri K. Srivasista	:	AERB

ADVISORY COMMITTEE ON CODE AND GUIDES ON GOVERNMENTAL ORGANISATION FOR REGULATION OF NUCLEAR AND RADIATION FACILITIES (ACCGORN)

Dates of meeting	:	February 23, 2010 June 18, 2010

Members and Invitees of ACCGORN:

Shri G.R. Srinivasan (Chairman)	:	AERB (Former)
Dr. S.K.Gupta	:	AERB (Former)
Dr. Ompal Singh	:	AERB (Former)
Dr. P.C. Basu	:	AERB (Former)
Shri R.I. Gujarathi	:	AERB (Former)
Shri S.N. Rao	:	AERB
Shri R. Bhattacharya	:	AERB
Shri S.A. Hussain	:	AERB (Former)
Shri A.K. Asrani	:	AERB (Former)
Shri T.N. Krishnamurthy	:	AERB (Former)
Shri Y.K. Shah (Member-Secretary)	:	AERB
Shri S.T. Swamy (Permanent-invitee)	:	AERB
Smt. V. Anuradha (Permanent-invitee)	:	AERB

LIST OF SAFETY CODE, SAFETY GUIDES AND SAFETY MANUALS FOR REGULATION OF NUCLEAR AND RADIATION FACILITIES

Safety Series No.	Title
AERB/SC/G	Regulation of Nuclear and Radiation Facilities
AERB/NPP/SG/G-1	Consenting Process for Nuclear Power Plants and Research Reactors
AERB/NF/SG/G-2	Consenting Process for Nuclear Fuel Cycle Facilities and Related Industrial Facilities other than Nuclear Power Plants and Research Reactors
AERB/RF/SG/G-3	Consenting Process for Radiation Facilities
AERB/SG/G-4	Regulatory Inspection and Enforcement in Nuclear and Radiation Facilities
AERB/SG/G-5	Role of the Regulatory Body with respect to Emergency Response and Preparedness at Nuclear and Radiation Facilities
AERB/NRF/SG/G-6 (Rev.1)	Development of Regulatory Safety Documents for Nuclear and Radiation Facilities
AERB/SG/G-7	Regulatory Consents for Nuclear and Radiation Facilities: Contents and Format
AERB/SG/G-8	Criteria for Regulation of Health and Safety of Nuclear Power Plant Personnel, the Public and the Environment
AERB/NPP&RR/ SM/G-1	Regulatory Inspection and Enforcement in Nuclear Power Plants and Research Reactors
AERB/NF/SM/G-2	Regulatory Inspection and Enforcement in Nuclear Fuel Cycle Facilities and Related Industrial Facilities other than Nuclear Power Plants and Research Reactors
AERB/RF/SM/G-3	Regulatory Inspection and Enforcement in Radiation Facilities

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