

AERB SAFETY GUIDE NO. AERB/SG/G-7

**REGULATORY CONSENTS FOR
NUCLEAR AND RADIATION FACILITIES:
CONTENTS AND FORMATS**

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FOREWORD

The establishment and operation of nuclear and radiation facilities, and the use of radioactive sources, contribute to the economic and social progress of the country. However, while undertaking such activities, the safety of workers concerned, the general public at large, and the environment is to be ensured and this is possible through compliance with relevant provisions of the Atomic Energy Act, 1962.

Since inception of the atomic energy programme in the country, importance has been given to the adoption and maintenance of high safety standards. In order to enforce safety standards, the Government of India constituted the Atomic Energy Regulatory Body (AERB), in November 1983.

The Board is entrusted with the responsibility for laying down safety standards and framing rules and regulations covering regulatory and safety functions envisaged under the above Act. AERB has therefore undertaken a programme of developing Safety Standards, Codes, Guides and Manuals for both nuclear and radiation facilities, covering all aspects such as siting, design, construction, operation, quality assurance, decommissioning and regulation.

Safety Standards contain internationally accepted safety criteria for design, construction and operation of specific equipment, systems, structures and components of nuclear and radiation facilities. Safety Codes are intended to establish objectives and to set minimum requirements that shall be fulfilled to provide adequate assurance for safety in nuclear and radiation facilities. Safety Guides provide guidelines and make available methods for implementing specific requirements as prescribed in line with relevant Safety Code(s). Safety Manuals are intended to elaborate specific aspects and may contain detailed technical information and/or procedures.

Consistent with accepted practice, 'shall' and 'should' used in these documents distinguish between firm requirements and a desirable option respectively, for the benefit of the user.

Emphasis in these documents is on protection of site personnel, the public and the environment from unacceptable radiological hazards. For aspects, not covered, applicable and acceptable national and international codes and standards shall be followed.

Industrial safety in nuclear and radiation facilities is to be ensured through strict compliance with applicable provisions of the Factories Act, 1948 and the Atomic Energy (Factories) Rules, 1996.

The Codes, Guides and Manuals will be revised as and when necessary in the light of experience and feedback from users as well as new developments in the field.

Based on its experience, the AERB has issued a Safety Code on 'Regulation of Nuclear and Radiation Facilities', to spell out the minimum safety-related requirements/ obligations to be met by a nuclear or radiation facility to qualify for the issue of regulatory consent at every stage leading to eventual operation. It is hoped that this will be of use to the Regulatory Body as well as to the applicant of any nuclear or radiation facility.

This Safety Guide on the "Regulatory Consents for Nuclear and Radiation Facilities: Contents and Formats" supplements the details on the consenting process stipulated in the Code. It provides guidance on the consenting process requirements and formats for the regulatory consents. The steps that are to be followed while submitting the application for consent are covered, thereby guiding the applicant as well as the staff of the Regulatory Body in meeting the regulatory requirements for consenting process.

The Guide has been prepared by a Working Group consisting of AERB staff and other professionals. In its drafting, use has been made of information contained in the relevant documents of IAEA. Experts have reviewed the Guide and the AERB Advisory Committees have vetted it before issue. The list of persons who have participated in Committee meetings, along with their affiliation, is appended in the document.

AERB wishes to thank all organisations and individuals who reviewed the draft and helped in the finalisation of the Safety Guide.



(Suhas P. Sukhatme)
Chairman, AERB

DEFINITIONS

Accident conditions

Substantial deviations from Operational States, which could lead to release of unacceptable quantities of radioactive materials. They are more severe than anticipated operational occurrences and include Design Basis Accidents and severe accidents.

Anticipated Operational Occurrences

An operational process deviating from normal operation, which is expected to occur during the operating lifetime of a facility but which, in view of appropriate design provisions, does not cause any significant damage to Items Important to Safety nor lead to Accident Conditions.

Applicant

The organization or person that applies for formal granting of Consent to perform specified activities related to the Siting, Design, Construction, Commissioning, Operation and Decommissioning of Nuclear and Radiation Facilities.

Approval

A formal consent issued by the Regulatory Body to a proposal.

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 facility and to perform safety and regulatory functions including enforcement for the protection of the public and operating personnel against radiation.

Authorisation

A type of regulatory consent issued by the Regulatory Body for all sources, practices and uses involving radioactive materials and radiation generating equipment. It also includes consent for specific stage wise activities of a nuclear facility. (See also “Regulatory Consent”)

Commissioning

The process during which structures, systems and components of a Nuclear and Radiation facility, having been constructed are made functional and verified to be in accordance with design specifications and to have met the performance criteria.

Consent

A written permission issued to the applicant by the Regulatory Body to perform specified activities related to Nuclear and Radiation facilities. The types of consents are 'License', 'Authorisation', 'Registration' and 'Approval' and will apply depending on the category of the nuclear/radiation facility, the particular activity and the radiation source involved.

Consignor

Any person, organisation or government, which prepares a consignment for transport and is mentioned as Consignor in the transport document.

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 data.

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 the workers, the public and the environment.

Design

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

Dose

A measure of radiation received or 'absorbed' by a target. The quantities termed absorbed dose, organ dose, equivalent dose, effective dose, committed equivalent dose or committed effective dose are used, depending on the context. The modifying terms are often omitted when they are not necessary for defining quantity of interest.

Emergency Plan

A set of administrative procedures to be implemented in the event of an accident.

Industrial Safety

Protection of all persons from undue industrial hazards.

Inspection

Quality control actions which by means of examination, observation or measurement determine the conformance of materials, parts, components, systems, structures as well as processes and procedures with pre-determined quality requirements.

License

A type of regulatory consent, granted by the Regulatory Body for all sources, practices and uses for nuclear facilities involving nuclear fuel cycle and certain categories of radiation facilities. It also means authority given by the Regulatory Body to a person to operate the above said facilities.

Limit

The value of a parameter or attribute (which is variable) used in certain specific activities or circumstances that must not be exceeded.

Maintenance

Organised activities covering all preventive and remedial measures, both administrative and technical necessary to ensure that all structures, systems and components are capable of performing as intended for safe operation of plant.

Nuclear Facility

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

Nuclear Fuel Cycle

All operations associated with the production of nuclear energy, including mining, milling, processing and enrichment of uranium or thorium; manufacture of nuclear fuel; operation of nuclear reactors; reprocessing of nuclear fuel, decommissioning; and any activity for radioactive waste management and any research or development activity related to any of the foregoing.

Nuclear Power Plant (NPP)

A thermal neutron reactor or a group of reactors together with all the associated structures, systems and components necessary for safety and for production of power i.e. electricity.

Nuclear Safety

Protection of all persons from undue radiological hazard

Operation

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

Operational Limits and Conditions (OLC)

Limits on plant parameters and a set of rules on functional capability and the performance level of equipment and personnel, approved by the Regulatory Body, for safe operation of the nuclear/radiation facility.

Practice

In case of radiological protection, any human activity that introduces additional sources exposure or exposure pathways or extends exposure to additional people or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure or people, or the number of people exposed.

Prescribed Substance

Any substance including any mineral which the Central Government may, by notification, prescribe, being a substance which in its opinion is or 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

Quality Assurance

Planned and systematic actions necessary to provide adequate confidence that an item or a facility will perform satisfactorily in service as per design specifications.

Records

Documents that furnish objective evidence of the quality of items and activities affecting quality. It also includes logging of events and other measurements.

Registration

A type of regulatory consent issued in respect of sources that include (a) medical diagnostic X-Ray equipment including computed tomography (CT) and therapy

simulator, (b) analytical X-Ray equipment used for research (c) nucleonic Guages (d) radioactive sources in tracer studies and practices that include bio-medical and (e) any other source and practice notified by the Regulatory Body.

Regulatory Clearance

A type of Regulatory Consent issued for a nuclear facility during intermediate stage of the consenting process

Regulatory Body

See “Atomic Energy Regulatory Board”.

Regulatory Consent

See ‘Consent’

Safety

See ‘Nuclear Safety’

Safety Systems

Systems important to safety, provided to assure, under anticipated operational occurrences and accident conditions, the safe shut down of the reactor (Shutdown System) and the heat removal from the core (Emergency Core Cooling System), and containment of any released radioactivity (Containment Isolation System).

Safety Analysis Report

A document provided by the applicant to the Regulatory Body containing information on the nuclear or radiation facility, its design, accident analysis and provisions to minimise the risk to the public and to the site personnel.

Safety-Related Systems

Those systems important to safety that are not included in Safety Systems.

Site

The area containing the facility defined by a boundary and under effective control of facility management.

Siting

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

Special Arrangement

Those provisions approved by the Competent Authority, under which consignments that do not satisfy all applicable requirements of Regulations may be transported.

Technical Specifications for Operation

A document approved by the Regulatory Body, covering operational limits and conditions, surveillance and administrative control requirements for the safe operation of nuclear or radiation facilities.

Testing

The determination or verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental or operational conditions.

Type Approval

A type of consent issued by the Regulatory Body based on evaluation of prototype of the device to ensure conformity with safety standards.

Type A Package

A package designed to withstand normal and accidental conditions of transport without loss or dispersal of its contents or loss of shielding integrity. The radioactive material may be transported in a Type A package either in special form radioactive material or other form with the provision that the activity shall not exceed the applicable limits prescribed in the relevant code on Transport of Radioactive materials (AERB/SC/TR-1)

Type B(U) Package

A package designed to contain an activity in excess of A1 in special form radioactive material, or in excess of A2 if not special form radioactive material, that is designed to withstand normal and accidental conditions of transport specified in the relevant Code on Transport of Radioactive materials [AERB/SC/TR-1]

Type B(M) Package

A package whose design or shipment requires multilateral approval because it does not meet all the requirements of a Type B(U) package [AERB/SC/TR-1]

CONTENTS

| | |
|---|-----|
| FOREWORD | i |
| DEFINITIONS | iii |
| 1. INTRODUCTION | 1 |
| 1.1 General | 1 |
| 1.2 Objective | 1 |
| 1.3 Scope | 1 |
| 2. STATUTORY BASES FOR REGULATORY CONSENTS | 3 |
| 2.1 General | 3 |
| 2.2 Issue of Regulatory Consents..... | 4 |
| 2.3 Consents Issued by the Department of Atomic Energy | 4 |
| 2.4 Consents/Authorisations Issued under Other Statutes | 4 |
| 2.5 Regulatory Consents for Different Types of Facilities | 5 |
| 2.5.1 Nuclear Power Plants and Research Reactors | 5 |
| 2.5.2 Nuclear Fuel Cycle and Related Industrial Facilities | 5 |
| 2.5.3 Radiation Facilities | 6 |
| 2.6 Regulatory Consents for Transport of Radioactive Materials | 7 |
| 3. RESPONSIBILITIES AND OBLIGATIONS | 8 |
| 3.1 General | 8 |
| 3.2 Responsibilities of the Regulatory Body | 8 |
| 3.3 Responsibilities of the Consentee..... | 9 |
| 3.4 Obligations of Consentee..... | 9 |
| 4. PROCEDURES FOR ISSUANCE OF REGULATORY CONSENT | 10 |
| 4.1 General | 10 |
| 4.2 Filing of Application for Regulatory Consent | 10 |
| 4.2.2 Nuclear Power Plants and Research Reactors | 10 |
| 4.2.3 Nuclear Fuel Cycle and Related Industrial Facilities | 11 |
| 4.2.4 Radiation Facilities | 11 |
| 4.2.5 Transport of Radioactive Materials | 11 |
| 4.3 Licenses/Consents to be Obtained under Other Statutes .. | 11 |
| 4.4 Granting of Regulatory Consents | 12 |
| 4.4.1 Consenting at Different Stages | 12 |
| 4.4.1.1. Siting | 12 |
| 4.4.1.2 Construction | 14 |
| 4.4.1.3 Commissioning | 15 |

| | | |
|---|--|----|
| 4.4.1.4 | Operation | 17 |
| 4.4.1.5. | Decommissioning | 18 |
| 4.5 | Guidelines for Filing of Application for Regulatory Consents | 19 |
| 4.5.1 | Application Particulars | 19 |
| 4.5.2 | Place of Filing | 19 |
| 4.5.3 | Application Fees | 19 |
| 4.6 | Guidelines for Issuing Regulatory Consents | 20 |
| 4.6.1 | Validity Period of Consent | 20 |
| 4.6.2 | Consenting Conditions | 20 |
| 5. | AMENDMENT/TERMINATION OF CONSENTS | 22 |
| 5.1 | General | 22 |
| 5.2 | Application for Amendment of Consent including Change of Consentee | 22 |
| 5.3 | Granting Modification of Regulatory Consents | 22 |
| 5.4 | Application for Terminating the Consent | 22 |
| ANNEXURE-I | : FORM B — FORMATS FOR CONSENTS FOR SITING, CONSTRUCTION, COMMISSIONING, OPERATION & DECOMMISSIONING | 24 |
| ANNEXURE-II | : FORM C — APPLICATION FOR MODIFICATION OF REGULATORY CONSENTING CONDITIONS | 42 |
| ANNEXURE-III | : FORM D — FORMAT FOR GRANTING MODIFICATION OF REGULATORY CONSENT | 43 |
| BIBLIOGRAPHY | | 45 |
| LIST OF PARTICIPANTS | | 46 |
| WORKING GROUP | | 46 |
| ADVISORY COMMITTEE ON PREPARATION OF CODE AND GUIDES ON GOVERNMENTAL ORGANISATION FOR REGULATION OF NUCLEAR AND RADIATION FACILITIES (ACCGORN) | | 47 |
| LIST OF SAFETY CODE AND GUIDES ON REGULATION OF NUCLEAR AND RADIATION FACILITIES | | 49 |

1. INTRODUCTION

1.1 General

- 1.1.1 The Safety Code on Regulation of Nuclear and Radiation Facilities (AERB/SC/G), hereinafter referred to as the Code, prescribes that Consent from Regulatory Body shall be obtained at various stages during setting up and operation of Nuclear and Radiation Facilities such as NPPs, Research Reactors, Nuclear Fuel Cycle Facilities and other Radiation Facilities.
- 1.1.2 The Code itself does not specify the format for application for consent and for the consent being issued, and for conditions to be stipulated in the consent. The Code has left it to the Regulatory Body to prescribe the formats. The Regulatory Body currently functioning in the country viz. AERB, has already indicated in different guides (AERB/SG/G-1, G-2 and G-3) the formats for applications seeking consent for different stages.
- 1.1.3 This guide provides consolidated information on the appropriate formats to be used, and information on consenting procedures. Thus the applicants as well as the staff of the Regulatory Body are guided in meeting the regulatory requirements for the consenting process.

1.2 Objective

- 1.2.1 The objective of this guide is to provide guidance on the consenting process requirements and the regulatory consent formats. The steps to be followed while submitting the application for consent are also covered. The guide supplements the code with the details on the consenting process stipulated in the Code.

1.3 Scope

- 1.3.1 For the benefit of users and in particular the applicant, this guide details the Acts, Rules and other regulatory documents which form the basis for regulation and issuance of regulatory consents.
- 1.3.2 The Guide identifies other documents, which provide formats for consent application. Guidelines to identify the type and quality of information needed to be furnished in an application for renewal or modification of consents are also covered.

- 1.3.3 The Guide summarises the roles and responsibilities of the Regulatory Body and the Consentee, and the obligations of the Consentee.
- 1.3.4 Guidance to the staff of Regulatory Body, for issuance, renewal, modification, and revocation of regulatory consents, is also included.
- 1.3.5 Recognising that differences in physical size, processes and capacity of various types of facilities have a bearing on the complexity and level of details to be furnished in the consent application, this guide categorises the utilities as under, for processing the application and issuance of Regulatory Consents:
- (i) Nuclear Power Plants and Research Reactors;
 - (ii) Nuclear Fuel Cycle and Industrial Facilities;
 - (iii) Radiation and Industrial Facilities.
- 1.3.6 This Guide also includes the consenting requirements for transportation of radioactive materials arising during operation of the above said facilities.

2. STATUTORY BASES FOR REGULATORY CONSENTS

2.1 General

2.1.1 The statutory bases for Regulatory Consents issued for Nuclear and Radiation Facilities are the enabling provisions in the Atomic Energy Act 1962, the Factories Act 1948 and some of the rules issued thereunder.

- (i) Section 17(i) of the Atomic Energy Act, 1962 empowers the Central Government to make provisions by necessary rules:
 - (a) to prevent injury to the health of persons employed in premises or places where any radioactive substance or any radiation generating plant, equipment or appliance is used;
 - (b) to prevent injury being caused to the health of persons engaged in the transport of any radioactive substance or prescribed substance, and others; and
 - (c) to ensure that radioactive wastes are disposed of safely.

2.1.2 Accordingly, the Radiation Protection Rules 1971, (RPR), and the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules 1987 were issued.

- (i) Rule 3 of the RPR 1971, prescribes that a licence from the Competent Authority is necessary for handling any radioactive substance;
- (ii) Rule 3 of the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules 1987, stipulates that an Authorisation from the Competent Authority is required for disposal or transfer of radioactive wastes;
- (iii) Section 23 of the Atomic Energy Act 1962 empowers the Central Government to administer the Factories Act 1948, and do all things for enforcing its provisions including the making of rules;

Under the above enabling provision, the Atomic Energy (Factories) Rules 1996 were issued.

Rule 4 of the said rules prescribes that 'Approval' of the Competent Authority shall be obtained for using any premises as a factory for purposes of the Atomic Energy Act 1962.

2.2 Issue of Regulatory Consents

- 2.2.1 For discharging the above and other safety-related functions, the Central Government, making use of the powers vested in it vide Section 27 of the Atomic Energy Act 1962, constituted in 1983, the "Atomic Energy Regulatory Board (AERB)", as the Regulatory Body and empowered it (vide Para 3 of the Notification) to function as 'Competent Authority' to enforce rules and regulations framed under the Atomic Energy Act 1962, for radiation safety in the country.
- 2.2.2 The consent of the AERB has to be obtained in the form of Licence/Authorisation for setting up and/or operating a nuclear or radiation facility.
- 2.2.3 For the benefit of the regulatory staff and the applicants, the AERB has prepared the Safety Code on Regulation of Nuclear and Radiation Facilities (AERB/SC/G), which covers the Consenting Process for Nuclear Power Plants and Research Reactors, Nuclear Fuel Cycle Facilities and Radiation Facilities.

2.3 Consents Issued by the Department of Atomic Energy

Besides the Licences/Authorisations issued by the Regulatory Board, licences issued by the Department of Atomic Energy itself, are needed under:

- (i) The Atomic Energy (Working of the Mines, Minerals and Handling of Prescribed Substances) Rules 1984,
- (ii) The Atomic Energy (Control of Irradiation of Food) Rules 1994.

2.4 Consents/Authorisations Issued under Other Statutes

- 2.4.1 Apart from the Regulatory Consents issued by the Regulatory Body, and the licences issued by the Department of Atomic Energy, Consents/Authorisations may also be needed by some of the nuclear facilities under such other statutes as:

- (a) The Water (Prevention and Control of Pollution) Act 1974,
- (b) The Air (Prevention and Control of Pollution) Act 1981,
- (c) The Hazardous Wastes (Management and Handling) Rules 1989.

The consenting agencies for the above three statutes are the Central/State Pollution Control Boards.

2.5 Regulatory Consents for Different Types of Facilities

2.5.1 Nuclear Power Plants and Research Reactors

2.5.1.1 The consenting process for Nuclear Power Plants (NPPs) and Research Reactors (RRs) is prescribed in Section-2 of the Code on Regulation of Nuclear and Radiation Facilities (AERB/SC/G). Consents are required at all major stages like siting, construction, commissioning, operation and decommissioning. In addition, regulatory clearances may be required for activities at intermediate stages.

2.5.1.2 Application for consents at different stages should be submitted in Form A. The format is prescribed in Safety Guide on 'Consenting Process for Nuclear Power Plants and Research Reactors: Document Submission, Regulatory Review and Assessment of Consent Applications' (AERB/SG/G-1).

2.5.2 Nuclear Fuel Cycle and Related Industrial Facilities

2.5.2.1 The consenting process for Nuclear Fuel Cycle, any other facility for processing prescribed substances and related industrial facilities will be in accordance with the stipulations in Section-3 of the Code, AERB/SC/G. The following facilities come under this category:

- (a) Uranium Mining and Processing,
- (b) Heavy Minerals Mining and Processing,
- (c) Uranium/Thorium Fuel Fabrication,
- (d) Heavy Water Production,
- (e) Spent Fuel Reprocessing,
- (f) Nuclear Waste Management,
- (g) Plutonium Recycling/Fuel Fabrication,
- (h) Zirconium, Beryllium Plants,
- (i) Any other facility for processing of prescribed substances.

2.5.2.2 The facilities related to the above activities and operated for research, development or special investigations shall also be considered under this consenting process. Applications for consents should be submitted in Form A.

The formats are prescribed in Safety Guide on 'Consenting Process for Nuclear Fuel Cycle and Related Industrial Facilities: Document Submission, Regulatory Review and Assessment of Consent Applications' (AERB/SG/G-2).

2.5.3 Radiation Facilities

2.5.3.1 Consenting process for all radiation facilities, sources and practices involving radioactive materials and radiation generating equipment is to be carried out under the provisions of Section-4 of the Code, AERB/SC/G. Consent Application should be submitted in Form A. The format is given in Safety Guide on 'Consenting Process for Radiation Facilities: Document Submission, Regulatory Review and Assessment of Consent Applications' (AERB/SG/G-3). Regulatory consents in the form of license/authorisation/registration are required to be issued for each of these individual facilities depending on the hazard potential. The following facilities/applications come under this category:

Facilities:

1. Land-based high intensity gamma irradiators,
2. High-energy particle accelerators used for research,
3. High-energy electron accelerators used for industrial research and commercial irradiation,
4. Commercial production of radioactive materials or radiation generating equipment,
5. Medical radiotherapy sources and equipment (Telegamma, Brachy therapy, electron accelerator),
6. Gamma irradiation chambers,
7. Nuclear medicine facilities,
8. Commercial production of nucleonic gauges,
9. Consumer products containing radioactive materials,
10. Medical diagnostic X-ray equipment including computed tomography (CT) and therapy simulator,
11. Analytical X-ray equipment.

Applications:

1. Use of nucleonic gauges,
2. Use of radioactive sources in tracer studies,
3. Biomedical research using radioactive materials,
4. RIA Labs.

Others:

Any other source and practice notified by the Regulatory Body

2.6 Regulatory Consents for Transport of Radioactive Materials

Consenting process and requirements for Packaging and Transport of Radioactive Material are described in the AERB Code on 'Transport of Radioactive Material', (AERB/SC/TR-1) and the AERB Code on 'Emergency Response Planning and Preparedness for Transport Accidents involving Radioactive Material' (AERB/SC/TR-3). The Safety Guide on 'Procedure for Forwarding, Transport, Handling and Storage of Radioactive Consignments', (AERB/SG/TR-3) provides the format for consent applications (Form A) for different types of packages and shipment approval for radioactive materials. Consent applications should be submitted in these formats.

3. RESPONSIBILITIES AND OBLIGATIONS

3.1 General

- 3.1.1 Effectiveness of the consenting process depends on the satisfactory discharge of their responsibilities and obligations by the Regulatory Body and the Consentee.
- 3.1.2 It is the responsibility of the Regulatory Body to provide all necessary know-how to the applicant to enable proper filing of the consent application, and to issue the consent if satisfied with the details and assurances furnished by the consentee. It is also the responsibility of the Regulatory Body to renew the consent if satisfied, and to revoke or suspend the consent if the consentee fails to comply with the commitments made.
- 3.1.3 The Consentee's obligations will be to comply with various conditions stipulated by the Regulatory Body, and also act as per the guidelines provided in the relevant Codes.

3.2 Responsibilities of the Regulatory Body

The responsibility of the Regulatory Body as it concerns the consenting process includes the following:

- (i) formulate the detailed requirements of the consenting process, stressing on the requirements to be fulfilled by the Consentee and publish appropriate Codes and Guides covering these;
- (ii) amend the above Codes and Guides from time to time in the light of evolving technology and circumstances encountered;
- (iii) provide exemptions from some of the consenting requirements, under special circumstances; and
- (iv) evaluate the performance of consentee from time to time after the consent is issued, and depending on performance, renew or suspend/cancel the consent.

3.3 Responsibilities of the Consentee

3.3.1 The consentee has the responsibility for compliance with the stipulated requirements, rules and conditions referred to or contained in the consent or otherwise applicable. The consentee is also responsible for carrying out activities in accordance with approved Quality Assurance programme covering all stages of the consenting process and to ensure that every step is carried out with due regard to safety.

3.4 Obligations of Consentee

3.4.1 The Consentee shall fulfill all the conditions stipulated in the consent explicitly or imposed by reference or attachment.

3.4.2 Without prejudice to the generality of the above, the conditions may include the following:

- (i) authorised representatives of the Regulatory Body shall be provided full access to personnel, facilities and records that are under the control of the Consentee;
- (ii) the Regulatory Body shall be kept fully informed of the latest technical developments or changes, if any, which affect the information, assumption etc. based on which consent was issued;
- (iii) corrective actions and measures as directed by the Regulatory Body shall be taken expeditiously;
- (iv) activities other than those authorised in the consent shall not be undertaken without the prior approval of the Regulatory Body;
- (v) records relating to the safety of the plant including those committed in the application, shall be maintained, and updated when necessary. Records prescribed in other applicable Acts and Rules, and in other consents issued, shall also be maintained;
- (vi) all accidents, incidents and events with safety significance shall be reported to the Regulatory Body, as prescribed in the relevant rules issued under the Atomic Energy Act, 1962.

4. PROCEDURES FOR ISSUANCE OF REGULATORY CONSENT

4.1 General

- 4.1.1 Different forms of consents are issued for various stages of nuclear power plants and research reactors (siting, construction, commissioning, operation and decommissioning), the nuclear fuel cycle and related industrial facilities, the radiation facilities and storage and transport of radioactive materials. These are Licence, Authorisation, Registration and Approval. These consents authorise the Consentee and lay down conditions on him and his activities.
- 4.1.2 The Regulatory Body may approve or reject the consents on the basis of its review and assessment as described in the AERB Safety Guides, AERB/SG/G-1, AERB/SG/G-2 and AERB/SG/G-3.

4.2 Filing of Application for Regulatory Consent

- 4.2.1 An application for a regulatory consent should be submitted in Form A to the Regulatory Body as detailed in the AERB Safety Guides mentioned in Section 4.1 above. A prospective applicant may seek any clarification from the Regulatory Body prior to filing an application. The Safety Guides provide detailed formats for Form A for filing application for regulatory consents for various Nuclear and Radiation Facilities.
- 4.2.2 Nuclear Power Plants and Research Reactors
- 4.2.2.1 The application for regulatory consent for Nuclear Power Plants (NPPs) and Research Reactors (RRs) shall be filed under the provisions of Chapter 2 of the 'Code'(AERB/SC/G). Separate applications need to be filed for obtaining consents for the various major stages such as siting, construction, commissioning, operation and decommissioning. If approvals or clearances are required for some other special activities specified in the Guide AERB/SG/G-1, applications for such approvals should be submitted separately. All the information provided in the application for NPPs or RRs should be in accordance with the requirements prescribed in the Safety Guide, AERB/SG/G-1. FORM-A in the Guide may be followed for this purpose.

4.2.3 Nuclear Fuel Cycle and Related Industrial Facilities

4.2.3.1 The application for regulatory consent for nuclear fuel cycle and related industrial facilities should be filed under the provisions of Chapter-3 of the Code. Consents may be issued for different stages (siting, construction, commissioning, operation and decommissioning) or a single consent for all the activities related to the facility may be given depending on the size and complexity of the facility. For obtaining Consent at different stages like siting, construction, commissioning, operation and decommissioning the Consentee should file separate applications. The necessary guidance for filing of the applications is given in the Safety Guide, AERB/SG/G-2. FORM-A in AERB/SG/G-2 may be followed for this purpose.

4.2.4 Radiation Facilities

4.2.4.1 The application for regulatory consent for Radiation Facilities which include applications of radiation in medicine, industry and research should be filed under the provisions of Chapter - 4 of the Code. A single approval for all the activities related to this type of facilities is issued. Separate formats have been prescribed for each type of these facilities. Necessary guidance for filing of the applications is given in the Guide, AERB/SG/G-3. Application Formats are specified in AERB/SG/G-3.

4.2.5 Transport of Radioactive materials

4.2.5.1 The application for regulatory consent for Transport of radioactive materials should be filed by the Consignor under the provisions of AERB Safety Code on Transport of Radioactive Material, (AERB/SC/TR-1). TYPE-A and TYPE-B approvals are issued for different types of packages of radioactive materials as specified in AERB/SC/TR-1. Formats for the above and for shipment approval under special arrangement are specified in AERB/SC/TR-1. Necessary guidance for filing of the application is given in the Safety Guide, AERB/SG/TR-1 and AERB/SG/TR-3. Formats provided in AERB/SG/TR-3 may be followed for this purpose.

4.3 Licences/Consents to be Obtained under Other Statutes

Other statutes also cover the Nuclear and Radiation Facilities as mentioned in 2.4.1. The Consentee should obtain the necessary licences/consents prescribed in those statutes from appropriate authorities, and fulfill the requirements and standards stipulated in those licences/consents.

4.4 Granting of Regulatory Consents

- (i) After a detailed review and assessment, the Regulatory Body grants the consent, if it is satisfied that the applicant meets fully the requirements. During this process, the Regulatory Body may ask for additional information and carry out inspection, if necessary.
- (ii) For Nuclear Power Plants, Research Reactors, and in some of the fuel cycle related industrial facilities the consents are granted at various stages. These are a) site approval, b) consent for construction, c) commissioning consent, d) operating consent and e) consent for decommissioning. For the purpose of issuance of consents in the stages stated above, the Regulatory Body may use the format as given in Form-B in Annexure-1 of this guide.
- (iii) Consents are granted for the Radiation Facilities in the form of authorisation, registration, licence or approval as described in Chapter-4 of the Code, AERB/SC/G.
- (iv) For Storage and Transport of Radioactive material, approvals are issued. Format for issuance of approval of package design, approval of the design of special form radioactive materials, shipment approval and shipment approval under special arrangement are given in AERB Safety Guide AERB/SG/TR-1.

4.4.1 Consenting at Different Stages

4.4.1.1 Siting

The initial application to the Regulatory Body is for site approval. This application should be accompanied by a site evaluation report which contains sufficient information as per requirements given in the Siting Code and Guides issued by the Regulatory Body regarding the proposed facility to enable the Regulatory Body to determine the nature of the site and the plant vis-à-vis the requirements. A summary description of the plant, outlining its size, the type of facility and the basic features of process and safety systems as well as data on land use, present and future population density, meteorological conditions, hydrology, hydrography, seismology and geology etc. should be included in the report.

- (i) Site approval with necessary conditions to be fulfilled, is issued by the Regulatory Body after being satisfied with the suitability of the site for the construction and operation of a nuclear facility as described in the site evaluation report.
- (ii) The relevant Codes and Guides for siting are:
Codes: AERB/SC/S, AERB/SC/G
Guides: AERB/SG/S-1 to S-11, AERB/SG/G-1 to G-8
- Conditions relating to site approval, shall include, apart from the general conditions detailed in para 3.4 of this guide, also the following site specific ones:
- (a) *Restriction on ownership of the site:* The Consentee shall not assign, transfer, sublet or part with possession of the site or any part thereof without the consent of the Regulatory Body,
- (b) *Access restrictions:* The Consentee shall take such steps as may be necessary to prevent unauthorised persons from entering the site or such part thereof as the Regulatory Body may stipulate. The Consentee shall erect suitable fences around the site and shall ensure that all such fences are properly maintained,
- (c) *Authorised person:* The Consentee shall:
- Appoint authorised persons who are qualified to perform the functions under the consent; and
 - Specify in writing the duties of the authorised persons.
- (d) *Preservation of records and certificates:* The Consentee shall ensure that every record made from time to time in pursuance of the conditions and every certificate granted under this consent or a copy of such record, or certificate shall be preserved for a period as the Regulatory Body may direct,
- (e) *Site construction:* The Consentee shall not proceed with activities related to the construction of the plant, prior to obtaining the consent for construction from the Regulatory Body,
- (f) *Nuclear fuel and other radioactive material:* The Consentee shall ensure that no nuclear fuel and other radioactive material is brought to the site unless the Regulatory Body has consented thereto.

4.4.1.2 Construction

- (i) Following site approval, the application for construction consent may be made. The construction is considered to commence with the start of first pour of concrete on completion of excavation, for foundations of any plant building or structure important to safety,
- (ii) Safety Report detailing the design description of systems and equipment, site characteristics, quality assurance programmes, applicable design codes, standards and specifications, preliminary accident analyses and radiological considerations as per requirements given in the Design and Quality Assurance Codes and Guides issued by the Regulatory Body should be submitted to the Regulatory Body along with the application. The relevant codes, standards and guides for NPP's* giving requirements for consent for construction are:

Codes : AERB/SC/D, AERB/SC/QA, AERB/SC/G

Standards : AERB/SS/CSE, AERB/SS/CSE-1 to 4,

Guides : AERB/SG/CSE-1 to 4, AERB/SG/D-1 to D-25
AERB/SG/QA-1 to QA-6, AERB/SG/G-1 and
AERB/SG/G-4 to G-8

- (iii) The Regulatory Body will process and review this application in consultation with technical bodies and advisory committees if necessary, and obtain any additional information from the applicant for necessary assessment of safety of the proposed project. After being satisfied, the Regulatory Body authorises the construction, stipulating conditions necessary to ensure that this stage can proceed in a manner that assures the safe operation of the facility,
- (iv) Conditions relating to Construction Consent, shall include, apart from the general conditions detailed in Section 3.4 of this guide, also the following specific ones:
 - (a) The facility shall be designed in accordance with design basis approved by the Regulatory Body for relevant site parameters,
 - (b) The facility shall be constructed in accordance with the design, which has been approved by the Regulatory Body. The Consentee shall not deviate from the approved design in any way that might affect safety, without the prior approval of the Regulatory Body,

* Codes, Standards and Guides relevant to Nuclear Fuel Cycle facilities and other Radiation Facilities are being identified/prepared.

- (c) Where applicable, the Consentee shall conduct tests to demonstrate structural and leak tightness integrity of the containment systems,
- (d) In addition, the Consentee should initiate a pre-operational radiological and meteorological study of the region for establishing baseline data.

4.4.1.3 Commissioning

When the facility is ready for commissioning, the applicant should submit an application for commissioning authorisation. The relevant codes, standards, guides and manuals, detailing the requirements for consent for commissioning of NPPs* are:

| | |
|-----------|--|
| Codes | : AERB/SC/O, AERB/SC/QA, AERB/SC/G |
| Standards | : AERB/SS/Fire |
| Guides | : AERB/SG/O-1 to O-13, AERB/SG/QA-1to QA-6 AERB/SG/G-1 and AERB/SG/G-4 to G-8 |

and other Guides & Manuals related to Radiation Protection.

While authorising commissioning of the facility, the Regulatory Body may stipulate a number of conditions, including the general ones detailed in Section 3.4 of this Guide, and the following:

- (i) The commissioning shall proceed only in accordance with the design parameters and operational limits, conditions and procedures as approved by the Regulatory Body,
- (ii) Components, systems and structures important to safety shall not be put into service unless inspected, tested and approved having being found to be in accordance with the design intent and terms of the consent,
- (iii) Commissioning shall be carried out in accordance with the programme approved by the Regulatory Body,
- (iv) The consentee shall provide approved storage facility for nuclear and radioactive materials. Appropriate physical security measures shall be provided and made effective,

* Codes, Standards and Guides relevant to Nuclear Fuel Cycle facilities and other Radiation Facilities are being indentified/prepared.

- (v) Any nuclear or radioactive material shall not be brought to the site without authorisation from the Regulatory Body,
- (vi) The facility is to be operated in accordance with the operational limits and conditions specified in the consent,
- (vii) The consentee shall have approved emergency plans.

The clearance for the commissioning programme may be given in several interim stages. These interim stages of commissioning programme for an Indian pressurised heavy water reactor are given below:

Phase A:

- (i) Hot conditioning or passivation of the primary system and light water commissioning of all process systems,
- (ii) Fuel loading* of the reactor core, and part borated heavy water addition to storage, cooling and moderator systems for flushing in specified limited quantity during which criticality is not possible,
- (iii) Addition of heavy water to primary heat transport system; and
- (iv) Bulk addition of Heavy water to moderator system with minimum specified boron level in heavy water to prevent reactor criticality.

* (If fuel loading is to be taken up after bulk heavy water addition to moderator system, then regulatory consent shall be obtained prior to fuel loading.)

Phase B:

- (i) Initial approach to criticality; and
- (ii) Low power reactor physics tests and experiments.

Phase C:

- (i) Initial system performance tests at low, intermediate and rated power levels as determined by the stable operation of the turbine; and
- (ii) System performance at rated power.

The Regulatory Body may alter the order of the above mentioned interim stages, add new stages, or combine some of the stages, in specific cases, if required.

4.4.1.4 Operation

After successful commissioning of the plant, the applicant may file an application for an operating consent as per requirements given in the applicable Code of Practice for Operation issued by the Regulatory Body. A final version of the safety report is to be submitted, documenting the final design and safety assessment, the results of commissioning, and the qualification of operating staff and the policies and procedures to be used in the operating facility. The Regulatory Body reviews the report and on being satisfied with the contents of the report grants operating consents or reviews them as per the provisions of the national statutes and the Codes and Guides issued by the Regulatory Body. Currently, authorisation is issued for a period of 3 years.

The applicable Codes, Standards and Guides detailing the requirements for consent for operation of NPPs*, are:

Codes : AERB/SC/O, AERB/SC/QA, AERB/SC/G,
Standards : AERB/SS/Fire,
Guides : AERB/SG/O-1 to O-13, AERB/SG/QA-1 to QA-6,
AERB/SG/G-1 and AERB/SG/G-4 to G-8,
and other Guides and Manuals related to radiation protection.

The conditions in the operating consent may include the following apart from the general conditions detailed in Section 3.4 of this Guide:

- (i) the Consentee shall not operate the plant in excess of the maximum capacity authorised by the Regulatory Body;
- (ii) the Consentee shall have a plant modification procedure approved by the Regulatory Body and ensure that no part of the plant important to safety will be modified without the prior approval of the Regulatory Body;
- (iii) the Consentee shall ensure that in-service inspection and testing is carried out as specified for systems, components and structures important to safety, on a time schedule approved by the Regulatory Body;
- (iv) the Consentee shall ensure that maintenance of safety-related equipment and plant is carried out to meet the reliability requirements approved by the Regulatory Body;

* Codes, Standards and Guides relevant to Nuclear Fuel Cycle facilities and other radiation facilities are being indentified/prepared.

- (v) the Consentee shall not make any change in the approved programs, procedures or technical specifications without prior approval by the Regulatory Body;
- (vi) the Consentee shall ensure that the plant is operated only under the control and supervision of authorised personnel in adequate numbers acceptable to the Regulatory Body.

4.4.1.5 Decommissioning

If the plant is to be decommissioned, the applicant shall apply to the Regulatory Body for a decommissioning consent well in advance (to be stipulated by the Regulatory Body) before the final shutdown of the plant. The applicant shall prepare a decommissioning plan detailing all steps/activities towards ultimate release of site for unrestricted/restricted use and submit to the Regulatory Body for approval. The guidelines for preparation of decommissioning plan are specified in Annexure-2 of the AERB Manual No. AERB/SM/Decom-1.

When authorising decommissioning, the Regulatory Body may impose whatever conditions are deemed necessary for safety. These conditions may include, apart from the general conditions detailed in section 3.4 of this Guide, also the following:

- (a) all occupational exposures arising out of decontamination, dismantling, waste conditioning, and disposal shall be governed by the dose limits and provisions contained in the Manual on Radiation Protection for nuclear facilities as amended from time to time,
- (b) Long-term disposal of radioactive wastes should be such that the dose limits for members of public due to,
 - a near surface disposal facility shall not exceed 100 microsievert (μSv) in a year,
 - a deep geological repository shall not exceed 100 μSv in a year,
- (c) The technical specification for operating facilities will cease to be valid after the fissile material is removed from the facility. The new set of technical specifications based on the evaluation made on the decommissioning plan shall be in force,
- (d) In respect of facilities that have handled fissile materials, the possibility that some residual fissile material may remain in the system shall be considered during decommissioning and appropriate recovery/disposal steps taken.

4.5 Guidelines for Filing of Application for Regulatory Consents

4.5.1 Application Particulars

The application forms seeking regulatory consent for various stages shall be in the prescribed format as specified or referred in the AERB Safety Guides SG/G-1, SG/G-2 and SG/G-3. General information should include the following:

- (i) the name of the applicant,
- (ii) the address of applicant, and
- (iii) a description of business or occupation of applicant:
 - if the applicant is a partnership, the name, citizenship and address of each partner and the principal location where the partnership does business;
 - if the applicant is a Corporation, the names, addresses and citizenship of its directors and principal officers;
 - whether it is owned, controlled by foreign corporation or foreign government;
- (iv) the use to which the facility will be put, the period of time for which the consent is sought, and a list of other consents, obtained or applied for in connection with the proposed facility;
- (v) information sufficient to demonstrate to the Regulatory Body the financial soundness of the applicant to carry out, the activities for which the consent is sought;
- (vi) if the applicant proposes to construct or alter a production or utilisation facility, the earliest and latest dates for completion of the construction or alteration.

4.5.2 Place of Filing

Each application, report and other written communication from the applicant seeking consent from the Regulatory Body shall be filed with the Regulatory Body and shall be executed in originals duly signed by the applicant.

4.5.3 Application Fees

The prescribed fee shall accompany each application. Prescribed fee will also be required while applying for renewal, amendment or termination of the consent.

4.6 Guidelines for Issuing Regulatory Consents

On being satisfied that the application for consent meets the prescribed requirements, the Regulatory Body will issue a consent, in such form and containing such conditions and limitations as it deems appropriate and necessary.

4.6.1 Validity Period of Consent

The Regulatory Body will issue the consent for the term requested by the applicant or for the estimated safe and useful life of the facility whichever is less. Each consent will be issued for a fixed period to be mentioned in the consent and Regulatory Body may ask for periodic safety review of the facility to be carried out, to demonstrate that the facility continues to perform safely in accordance with the consenting conditions.

4.6.2 Consenting Conditions

Whether stated therein or not, the following shall be deemed conditions in every consent issued:

- (a) Each Consentee shall implement the Quality Assurance Program laid down as per requirements of the Quality Assurance Code AERB/SC/QA and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to handle, utilise or transfer of the prescribed substances is conferred to the Consentee except as stated explicitly in the consent;
- (c) Neither the consent nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer or control of the consent to any person, unless the Regulatory Body, after securing full information, and reviewing it, is satisfied, and gives its consent in writing;
- (d) The consent is subject to revocation, suspension, modification or amendment for valid reasons, which are to be recorded;
- (e) The terms and conditions of the consent can be amended, revised or modified as considered necessary by the Regulatory Body which shall record the reasons;

- (f) The Consentee shall provide for the development, implementation and maintenance of a comprehensive emergency preparedness programme;
- (g) The Consentee may take reasonable action that departs from a consent condition or a technical specification in an emergency if such action is immediately needed to protect the public health and safety and it is apparent that no action consistent with consent conditions and technical specifications can provide adequate or equivalent protection. Such of these actions shall be reported to the Regulatory Body within 24 hours, followed by a detailed report within 20 days.

5. AMENDMENT/TERMINATION OF CONSENTS

5.1 General

The granting of consent does not restrict or preclude subsequent amendment, suspension or revocation of that consent by the Regulatory Body during the period of its validity. The Consentee may initiate a request for an amendment or the Regulatory Body in the interest of safety may impose an amendment. A modification of the consent may be desirable or necessary as a result of proposed changes related to the facilities which have already received a consent, experience elsewhere, technological evolution, or as a consequence of safety research and development. Amendment may also be asked for with respect to change in the Consentee without change in the facility. An application for an amendment to consent should be filed with the Regulatory Body as prescribed in this section.

5.2 Application for Amendment of Consent including Change of Consentee

Whenever a holder of a consent desires that the consent conditions need to be amended, an application for the amendment may be filed with the Regulatory Body, detailing the changes desired, and the justification for changes. One of the changes may be the change in Consentee himself. The application should be filed in Form-C as provided in the annexure - II of this guide.

If the application is for change in the Consentee, it should include information on the new Consentee such as details about his identity and technical qualifications, etc; (Refer Section 4.5)

5.3 Granting Modification of Regulatory Consents

After a detailed review and assessment of the application for modification (amendment or termination) from the Consentee, and on being satisfied, the Regulatory Body may grant its consent for modification. For issuing an amendment, Form-D as provided in the annexure-III of this guide will be used. This certificate is to be appended to the original consent.

5.4 Application for Terminating the Consent

- (i) The Consentee, for valid reasons, may apply to the Regulatory Body for permission to terminate the operation even before the consenting period

is over, dismantle the facility and dispose of its component parts. For this purpose, the Consentee shall provide information on the proposed procedures for disposal of radioactive substances, decontamination of the site and other procedures. The Consentee should also provide reasonable assurance that the dismantling of the facility and disposal of the component parts will be performed in accordance with relevant rules and will not cause undue risk to the health and safety of the public;

- (ii) On being satisfied that the dismantling of the facility and disposal of the component parts will be performed in accordance with the rules and will not cause undue risk to the health and safety of the public, the Regulatory Body may authorise such dismantling and disposal, and providing for termination of the consent upon completion of such procedures in accordance with any conditions specified.

ANNEXURE-I

FORM-B (SITING)

**FORMAT FOR CONSENT FOR SITING OF
A NUCLEAR/RADIATION FACILITY**

With reference to Application No _____ (FORM A) dated _____

Shri _____

of _____

having undertaken to comply with the conditions prescribed in the

- Atomic Energy Act, 1962 and the Rules framed thereunder,
- The relevant applicable Codes and Guides giving requirements for siting stages*

and any orders issued thereunder, and having paid the prescribed consent fee is hereby authorised to locate the facility at the site _____ (name, type, capacity and location).

This consent is issued on _____ and is valid until _____ subject to the conditions mentioned hereunder.

Signature and Seal of the
Competent Authority

* The relevant applicable Codes, Standards and Guides for NPPs giving requirements for consent for siting are:

Codes: AERB/SC/S, AERC/SC/G

Guides: AERB/SG/S-1 to S-11, AERB/SG/G-1 to G-8

1. Conditions in section 4.4.1.1 of the Safety Guide, AERB/SG/G-7(Revision No./Issue date)

- (a) The Consentee shall not assign, transfer sublet or part with possession of the site or any part thereof without prior consent of the Regulatory Body;
- (b) The Consentee shall take such steps as may be necessary to prevent unauthorised persons from entering the site or such part thereof as the Regulatory Body may stipulate;
- (c) The Consentee shall provide suitable access restrictions and/or fences on the site and shall ensure that these are properly maintained;
- (d) The Consentee shall appoint authorised persons who are qualified to perform functions under the consent;
- (e) Specify accurately in writing the duties of the authorised persons.

2. Consenting Conditions in Section 4.6.2 of the Safety Guide AERB/SG/G-7 (Revision No./Issue date)

- (a) Each Consentee shall implement the Quality Assurance Programme laid down as per requirements of the Quality Assurance Code and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to own, handle, utilise or transfer of the prescribed substances is conferred to the Consentee except as stated explicitly in the consent;
- (c) Neither the consent nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the consent to any person, unless the Regulatory Body, after securing full information, finds that the transfer is in accordance with the provisions of Atomic Energy Act, and the rules made thereunder, and gives this consent in writing;
- (d) The consent is also subject to revocation, suspension, modification or amendment, for causes as provided in the Atomic Energy Act and rules made thereunder, in accordance with the procedures laid down in the Act;

- (e) The terms and conditions of the consent can be amended, revised, or modified as considered necessary by the Regulatory Body in the interest of safety;
- (f) A nuclear facility Consentee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness programme.

3. Other Consenting Conditions

- (a) This consent may be suspended or cancelled, if any declaration made or information given in Form A of the application is found to be false or if any undertaking given in such application is not carried out;
- (b) No activity or operation shall be carried out for purposes other than those mentioned in the application;
- (c) Full access to facilities shall be accorded to any authorised representative of the consenting authority;
- (d) Any changes in the authorised personnel should be duly notified to the Regulatory Body;
- (e) No modification in the site shall be carried out without prior approval of the consenting authority.

4. Conditions Stipulated by the Safety Committees

Specific conditions as stipulated by different safety committees of the Regulatory Body during Siting review held subsequently are given as Attachment (s)

5. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter alia, the conditions described in clause 4 above.

FORM-B (CONSTRUCTION)

**FORMAT FOR CONSENT FOR CONSTRUCTION OF
A NUCLEAR/RADIATION FACILITY**

With reference to Application No. _____ (FORM A) dated _____

Shri _____

of _____

having undertaken to comply with the conditions prescribed in the

- Atomic Energy Act, 1962 and the rules framed thereunder,
- The relevant applicable Codes and Guides giving requirements for construction stage *

and any orders issued thereunder, and having paid the prescribed consent fee is hereby authorised to utilise the proposed site to construct the facility namely _____ (name, type, capacity and location).

This consent is issued on _____ and is valid until _____ subject to conditions mentioned hereunder.

Signature and Seal of the
Competent Authority

* The relevant applicable Codes, Standards and Guides for NPP giving requirements for consent for construction are:

Codes: AERB/SC/D, AERC/SC/QA, and AERB/SC/G.
Standards: AERB/SS/F, AERB/SS/CSE-1 to CSE-4
Guides: AERB/SG/D-1 to D-25, AERB/SG/QA-1 to QA-6,
AERB/SG/CSE-1 to CSE-4, AERB/SG/G-1 to G-8

1. Conditions in Section 4.4.1.2 of the Safety Guide AERB/SG/G-7 (Revision No. / Date of issue)

- (a) The facility shall be designed and constructed in accordance with design basis approved by the Regulatory Body for relevant site parameters,
- (b) The facility shall be constructed in accordance with the design approved by the Regulatory Body. The Consentee shall not deviate from approved design in any way that might affect safety, without prior approval of the Regulatory Body,
- (c) The Consentee should initiate a pre-operational radiological study of the region for establishing base-line radiological and other relevant data (meteorology etc).

2. Consenting Conditions in Section 4.6.2 of Safety Guide AERB/SG/G-7 (Revision No. /Date of Issue)

- (a) Each Consentee shall implement the Quality Assurance Programme laid down as per requirements of the Quality Assurance Code AERB/SC/QA and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to own, handle, utilise or transfer of the prescribed substances conferred to the Consentee except as stated explicitly in the consent;
- (c) Neither the consent, nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer or control of the consent to any person, unless the Regulatory Body, after securing full information, finds that the transfer is in accordance with the provisions of the Atomic Energy Act, and the rules made thereunder and gives this consent in writing;
- (d) The consent is also subject to revocation, suspension, modification or amendment for causes as provided in the Atomic Energy Act and the rules made thereunder, in accordance with the procedures laid down in the Act;
- (e) The terms and conditions of the consent can be amended, revised or modified as considered necessary by the Regulatory Body in the interest of safety;

- (f) A nuclear facility Consentee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness programme including adequate interfaces with state and local governments;
- (g) The Consentee may take reasonable action that departs from a consent condition or a technical specification in an emergency if such action is immediately needed to protect the public health and safety and it is apparent that no action consistent with consent conditions and technical specifications can provide adequate or equivalent protection. Such of these actions shall be reported to the Regulatory Body within 24 hours, followed by a detailed report within 20 days.

3. Other Consenting Conditions

- (a) This consent may be suspended or cancelled, if any declaration made or information given in Form A of the application is found to be false or if any undertaking given in such application is not carried out;
- (b) No activity or operation shall be carried out for purposes other than those mentioned;
- (c) Full access to facilities shall be accorded to any authorised representative of the consenting authority;
- (d) Any changes in the authorised personnel should be duly notified to the Regulatory Body;
- (e) No modification in site shall be carried out without prior approval of the consenting authority;
- (f) Information on unusual incidents, industrial accidents or fatalities should be promptly reported to the Regulatory Body;
- (g) Medical facilities and industrial safety provisions shall be provided to the employees.

4. Conditions Specified by Safety Committees

Specific conditions as stipulated by different safety committees of the Regulatory Body during reviews held subsequently are given as Attachment(s).

5. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter alia, the conditions described in Clause 4 above.

FORM-B (COMMISSIONING)

**FORMAT FOR CONSENT FOR COMMISSIONING OF
A NUCLEAR/RADIATION FACILITY**

With reference to the Application No. (FORM A) _____ dated _____

Shri _____

of _____

having undertaken to comply with the conditions prescribed in the

- Atomic Energy Act, 1962 and the rules framed thereunder,
- The relevant applicable Codes and Guides giving requirements for commissioning and operation stages*

and any orders issued thereunder, and having paid the prescribed consent fee is hereby authorised to commission the facility namely _____
(name, type, capacity and location of the site)

This consent is issued on _____ and is valid until _____
subject to conditions mentioned.

Signature and Seal of the
Competent Authority

* The relevant applicable Codes, Standards and Guides for NPP giving requirements for consent for commissioning and operation stages are:

Codes: AERB/SC/O, AERC/SC/QA, and AERB/SC/G.

Standards: AERB/SS/F,

Guides: AERB/SG/O-1 to O-13, AERB/SG/QA-1 to QA-6,
AERB/SG/G-1 to G-8

Other Guides and Manuals related to radiation protection.

1. Conditions in Section 4.4.1.3 of the Safety Guide AERB/SG/G-7 (Revision No./Date of Issue)

- (a) The commissioning shall proceed only in accordance with design parameters and operational limits, conditions and procedures as approved by the Regulatory Body;
- (b) Completed components, systems and structures important to safety shall not be put into service unless inspected, tested and approved as being in accordance with design intent and terms of the consent;
- (c) Commissioning shall be carried out in accordance with the programme approved by the Regulatory Body;
- (d) The Consentee shall provide approved storage facility for all nuclear and radioactive materials. Appropriate physical security measures shall be made effective;
- (e) Any nuclear or radioactive material shall not be brought to site without the authorisation of Regulatory Body;
- (f) The facility is to be operated in accordance with operational limits and conditions specified in the consent;
- (g) The Consentee shall have an approved on-site and off-site emergency plan.

2. Consenting conditions in section 4.6.2 of Safety Guide AERB/SG/G-7 (Revision No./Date of Issue)

- (a) Each Consentee shall implement the Quality Assurance Programme laid down as per requirements of the Quality Assurance Code AERB/SC/QA and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to own, handle, utilise or transfer of the prescribed substances is conferred to the Consentee except as stated explicitly in the consent;
- (c) Neither the consent nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the consent to any person, unless the Regulatory Body, after securing full information, find that the transfer is in accordance with the provisions of the Atomic Energy Act, and the rules made thereunder and give this consent in writing;

- (d) The consent is also subject to revocation, suspension, modification or amendment, for causes as provided in the Atomic Energy Act and rules and regulations made there under in accordance with the procedures laid down in the act;
- (e) The terms and conditions of the consent can be amended, revised, or modified as, considered necessary by the Regulatory Body in the interest of safety;
- (f) A nuclear facility Consentee shall provide for the development, revision, implementation, and maintenance of its emergency preparedness program;
- (g) The Consentee may take reasonable action that departs from a consent condition or a technical specification in an emergency if such action is immediately needed to protect the public health and safety and it is apparent that no action consistent with consent conditions and technical specifications can provide adequate or equivalent protection. Such of these actions shall be reported to the Regulatory Body within 24 hours, followed by a detailed report within 20 days.

3. Other Conditions

- (a) This consent may be suspended or cancelled, if any declaration made or information given in FORM A of the application is found to be false or if any undertaking given in such application is not carried out;
- (b) No activity or operation shall be carried out for purposes other than those mentioned;
- (c) Full access to facilities shall be accorded to any authorised representative of the consenting authority;
- (d) Any changes in the authorised personnel should be duly notified to the regulatory body;
- (e) No modification in the site shall be carried out without prior approval of the consenting authority;
- (f) Information on unusual incidents, industrial accidents or fatalities should be promptly reported to the Regulatory Body;
- (g) Medical facilities and industrial safety provisions shall be provided to the employees;

4. Conditions Stipulated by the Safety Committees

The specific conditions as stipulated by the different safety committees of the Regulatory Body during commissioning review held subsequently may be reported as Attachment(s)

5. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter-alia, the conditions described in clause 4 above.

FORM-B (OPERATION)

**FORMAT FOR CONSENT FOR OPERATION OF
A NUCLEAR/RADIATION FACILITY**

With reference to Application No. _____ (FORM A)
dated _____

Shri _____

of _____

having undertaken to comply with the conditions prescribed in the

- Atomic Energy Act, 1962 and the rules framed thereunder
- Applicable Codes and Guides for giving requirement for operation stages*

and any orders issued thereunder, and having paid the prescribed consent fee is/are hereby authorised to operate the facility namely _____ (name, type and location of the site).

This consent is issued on _____ and is valid until _____ subject to the conditions mentioned hereunder.

Signature and Seal of the
Competent Authority

* The relevant applicable Codes, Standards Guides and Manuals for NPP giving requirements for consent for Commissioning and operation stages are:

Codes: AERB/SC/O, AERC/SC/QA, and AERB/SC/G.

Standards: AERB/SS/Fire,

Guides: AERB/SG/O-1 to O-13, AERB/SG/QA-1 to QA-6,
AERB/SG/G-1 to G-8

Other Guides and Manuals related to radiation protection.

1. Conditions in Section 4.4.1.4 of the Safety Guide AERB/SG/G-7

- (a) The Consentee shall not operate the plant in excess of the maximum capacity authorised by the Regulatory Body;
- (b) The Consentee shall have a plant modification procedure approved by the Regulatory Body to ensure that no part of the approved plant important to safety will be modified without the prior approval of the Regulatory Body;
- (c) The Consentee shall ensure that the plant is subjected to in-service inspection and testing to be carried out as specified for systems, components and structures important to safety on a time schedule approved by the Regulatory Body;
- (d) The Consentee shall ensure that maintenance of safety-related equipment and plant is carried out to meet the reliability requirements approved by the Regulatory Body;
- (e) No changes shall be made to the programmes, procedures or technical specifications, which have been approved by the Regulatory Body without such changes being given prior approval by the Regulatory Body;
- (f) The Consentee shall ensure that the plant is operated only under the control and supervision of authorised personnel in adequate numbers acceptable to the Regulatory Body.

2. Consenting Conditions in Section 4.6.2 of the Safety Guide AERB/SG/G-7

- (a) Each Consentee shall implement the Quality Assurance Programme laid down as per requirements of the Quality Assurance Code AERB/SC/QA and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to own, handle, utilise or transfer of the prescribed substances is conferred to Consentee except as stated explicitly in the consent;
- (c) Neither the consent, nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer or control of the consent to any person, unless the Regulatory Body shall after securing full information, find that the transfer is in accordance with the provisions of the Atomic Energy Act, and the rules made thereunder, give the consent in writing;

- (d) The consent is subject to revocation, suspension, modification or amendment for causes as provided in the Atomic Energy Act and rules made thereunder in accordance with the procedures laid down in the Act;
- (e) The terms and conditions, of the consent can be amended, revised or modified, as considered necessary by the Regulatory Body in the interest of safety;
- (f) A nuclear facility Consentee shall ensure implementation and maintenance of its emergency preparedness program;
- (g) The Consentee may take reasonable action that departs from a consent condition or a technical specification in an emergency if such action is immediately needed to protect the public health and safety and it is apparent that no action consistent with consent conditions and technical specifications can provide adequate or equivalent protection. Such of these actions shall be reported to the Regulatory Body within 24 hours, followed by a detailed report within 20 days.

3. Other Consenting Conditions:

- (a) This consent may be suspended or cancelled, if any declaration made or information given in FORM A of the application is found to be false or if any undertaking given in such application is not carried out;
- (b) No activity or operation shall be carried out for purposes other than those mentioned;
- (c) Full access to facilities shall be accorded to any authorised representative of the consenting authority;
- (d) Any changes in authorised personnel should be duly notified to the Regulatory Body;
- (e) No modification in site shall be carried out without prior approval of the consenting authority;
- (f) Information on unusual incidents, industrial accidents or fatalities should be promptly reported to the Regulatory Body;
- (g) Medical facilities and industrial safety provisions shall be provided to the employees.

4. Conditions Stipulated by Safety Committees

Specific conditions as stipulated by different safety committees of the Regulatory Body during operation review held subsequently are given as Attachment (s).

5. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter alia, the conditions described in clause 4 above.

FORM-B (DECOMMISSIONING)

**FORMAT FOR CONSENT FOR DECOMMISSIONING OF
A NUCLEAR/RADIATION FACILITY**

With reference to Application No. _____ (FORM A) dated _____

Shri _____

of _____

having undertaken to comply with the conditions prescribed in the

- Atomic Energy Act, 1962 and the rules framed thereunder,
- Decommissioning plan specified in the AERB Manual No. AERB/SM/Decom-1 Annexure-2, and other guides and manuals related to radiation protection,

and any orders issued thereunder and having paid the prescribed consent fee is/are hereby authorised to decommission the facility namely _____
(name, type, capacity and location of the site).

This consent is issued on _____ and is valid until _____ subject to conditions mentioned.

Signature and Seal of the
Competent Authority

1. Conditions in Section 4.4.1. 5 of the Safety Guide AERB/SG/G-7 (Revision No./Date of Issue)

- (a) All occupational exposures arising out of decontamination, dismantling, waste conditioning, and disposal shall be governed by the dose limits and provisions contained in the manual of radiation protection for nuclear facilities as amended from time to time;
- (b) Criteria for long-term disposal should be such that the dose limits for members of public due to
 - a near surface disposal facility shall not exceed 100 micro-sievert/y
 - deep geological repository shall not exceed 100 micro-sievert/y
- (c) The technical specification for operating facilities will cease to be valid after the final shutdown of the facility. The new set of technical specifications based on evaluation made on the decommissioning plan shall be in force;
- (d) For facilities that have handled fissile materials, the possibility that some residual fissile material remains in the system shall be given due consideration during decommissioning and suitable precautions taken.

2. Consenting Conditions in Section 4.6.2 of the Safety Guide AERB/SG/G-7 (Revision No./Date of Issue)

- (a) Each Consentee shall implement the Quality Assurance Programme laid down as per requirements of the Quality Assurance Code AERB/SC/QA and any other requirements stipulated by the Regulatory Body in this regard from time to time;
- (b) No right to own, handle, utilise or transfer of the prescribed substances is conferred to Consentee except as stated explicitly in the consent;
- (c) Neither the consent, nor any right thereunder, nor any right to utilise or procure prescribed substances shall be transferred, assigned or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer or control of the consent to any person, unless the Regulatory Body shall, after securing full information, find that the transfer is in accordance with the provisions of the Atomic Energy Act, and the rules made thereunder, gives the consent in writing;

- (d) The consent is subject to revocation, suspension, modification or amendment for causes as provided in the Atomic Energy Act and rules made thereunder, in accordance with procedures laid down in the Act;
- (e) The terms and conditions, of the consent can be amended, revised or modified, as considered necessary by the Regulatory Body in the interest of safety;
- (f) A nuclear facility Consentee shall provide for the development, implementation and maintenance of its emergency preparedness programme;
- (g) The Consentee may take reasonable action that departs from a consent condition or a technical specification in an emergency if such action is immediately needed to protect the public health and safety and it is apparent that no action consistent with consent conditions and technical specifications can provide adequate or equivalent protection. Such of these actions shall be reported to the Regulatory Body within 24 hours, followed by a detailed report within 20 days.

3. Other Consenting Conditions

- (a) This consent may be suspended or cancelled, if any declaration made or information given in FORM A of the application is found to be false or if any undertaking given in such application is not carried out;
- (b) No activity or operation shall be carried out for purposes other than those mentioned;
- (c) Full access to facilities shall be accorded to any authorised representative of the consenting authority;
- (d) Any changes in the authorised personnel should be duly notified to the Regulatory Body;
- (e) No modification in the site shall be carried out without prior approval of the consenting authority;
- (f) Information on unusual incidents, industrial accidents or fatalities should be promptly reported to the Regulatory Body;
- (g) Medical facilities and industrial safety provisions shall be provided to the employees.

4. Conditions Stipulated by Safety Committees

Specific conditions as stipulated by different safety committees of the Regulatory Body during decommissioning review held subsequently, are given in the Attachments (s).

5. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter alia, the conditions described in clause 4 above.

ANNEXURE-II
FORM-C (MODIFICATION)
APPLICATION FOR MODIFICATION OF REGULATORY
CONSENTING CONDITIONS

(To be submitted in duplicate to the Regulatory Body at least one month prior to undertaking the modifications)

1. Particulars of the applicant

- 1.1 Name and address of the organisation.
- 1.2 Name and designation of the head of the organisation.
- 1.3 Address of the organisation including telephone, telex, fax number and e-mail.

2. Particulars of the consent

- 2.1 Nature of the consent.
- 2.2 Reference number and date issued.
- 2.3 Validity date.

3. Particulars of the modification

- 3.1 Describe the consenting conditions/equipment/proposal or any other statement made in the consent application requiring modification.
- 3.2 Description of the modification.
- 3.3 Justification of the modification.
- 3.4 Implication of the modification sought on other related sections and clauses of the consent application and other safety requirements.

4. Safety assessment

(describe safety significance of the proposed change, radiological implications, deviations required/necessary in consenting conditions, justification with respect to risk reduction, risk achievement worth and results of the PSA studies carried out)

5. Status of earlier reviews, if any

(include any application of this kind, reviewed/submitted earlier)

Sd/-
CONSENTEE

ANNEXURE-III

FORM-D (CONSENT FOR MODIFICATION)

FORMAT FOR GRANTING MODIFICATION OF REGULATORY CONSENT

With reference to the modification proposal No. (FORM C) submitted by

Shri _____

of _____

the Competent Authority is hereby agreed to modify/amend the consent _____
issued vide No. _____ dated _____ as
follows:

1. Change in Consent Application _____
2. Changes in Consent Condition _____

subject to conditions mentioned.

Signature and Seal of the
Competent Authority

1. Conditions for Consent Modification

- (a) involve a significant increase in the probability or consequence of an accident previously evaluated; or
- (b) create the possibility of a new or different kind of accident from any accident previously evaluated; or
- (c) involve a significant reduction in a margin of safety; or
- (d) involve a change in rules/regulations etc;

2. Conditions Stipulated by Safety Committees

Specific conditions as stipulated by different safety committees of the Regulatory Body during review held subsequently are given as Attachment (s).

3. Attachments

One or more attachments, as appropriate, may form an integral part of the consent. These attachments are to provide, inter alia, the conditions described in clause 2 above.

BIBLIOGRAPHY

1. IAEA Safety Guide No. 50-SG-G8, Licenses for Nuclear Power Plants: Content, Format and Legal considerations
2. Licensing and Regulatory Control of Nuclear Installations, IAEA, Legal Series No. 10
3. Licensing Systems and Inspection of Nuclear Installations, Nuclear Energy Agency (OECD)
4. Licensing Guide No. 1, Siting Guide for Heavy Water Plants utilising the Girdler-Sulphide Process, AECB
5. AECB-1139, The Licensing Process for Nuclear Power Reactors by M. Joyce, AECB.
6. 10 CFR Part 50, Domestic Licensing of Production and Utilization Facilities, US NRC
7. Standard Format and Content of Safety Analysis Reports for NPPs (LWR Edition) US NRC, Regulatory Guide No. 1.70
8. Standard Format and Content of License Applications for Plutonium Processing and Fuel Fabrication Plants, US NRC, Regulatory Guide 3.39
9. Preparation of Environmental Reports for Nuclear Power Plants, US NRC gulatory Guide No. 4.2

LIST OF PARTICIPANTS

WORKING GROUP

| | | |
|-------------------|------------------|------------------------|
| Dates of meeting: | June 5, 1995 | October 20, & 21, 1998 |
| | October 20, 1995 | November 27, 1998 |
| | August 13, 1998 | August 18, 1999 |

Members and Invitees participated in the meetings:

| | | |
|--------------------------------------|---|------|
| Shri Naresh Kumar Jhamb (Chairman) | : | AERB |
| Dr. K.S. Parthasarathy | : | AERB |
| Dr. P.C. Basu | : | AERB |
| Shri L.V. Behari | : | NPC |
| Shri S.K. Warriar | : | AERB |
| Shri K.K. Chandraker | : | AERB |
| Shri S. Harikumar (Member-Secretary) | : | AERB |
| Shri Jaharlal Koley (co-opted) | : | AERB |
| Shri Deepak Ojha (co-opted) | : | AERB |
| Smt V. Anuradha (co-opted) | : | AERB |
| Smt S. Bhattacharya (invitee) | : | AERB |
| Shri L.R. Bishnoi (invitee) | : | AERB |
| Shri V.S. Rajagopalan (invitee) | : | AERB |

**LIST OF SAFETY CODE AND GUIDES ON REGULATION
OF NUCLEAR AND RADIATION FACILITIES**

| Safety Series No. | Title |
|-------------------|--|
| AERB/SC/G | Regulation of Nuclear and Radiation Facilities |
| AERB/SG/G-1 | Consenting Process for Nuclear Power Plants and Research Reactors: Documents Submission, Regulatory Review and Assessment of Consent Applications |
| AERB/SG/G-2 | Consenting Process for Nuclear Fuel Cycle Facilities and Related Industrial Facilities: Documents Submission, Regulatory Review and Assessment of Consent Applications |
| AERB/SG/G-3 | Consenting Process for Radiation Facilities: Document Submission, Regulatory Review and Assessment of Consent Applications |
| AERB/SG/G-4 | Regulatory Inspection and Enforcement in Nuclear and Radiation Facilities |
| AERB/SG/G-5 | Role of Regulatory Body with Respect to Emergency Response and Preparedness at Nuclear and Radiation Facilities |
| AERB/SG/G-6 | Codes, Standards and Guides to be prepared by the Regulatory Body for Nuclear and Radiation facilities |
| AERB/SG/G-7 | Regulatory Consents for Nuclear and Radiation Facilities: Contents and Formats |
| AERB/SG/G-8 | Criteria for Regulation of Health and Safety of Nuclear Power Plant Personnel, the Public and the Environment |