IAEA
International Atomic Energy Agency

Site and External Events Design (SEED) Guidelines for the Preparation and Conduct of SEED Missions

Vienna, December 2019

IAEA Services Series 42

IAEA SAFETY STANDARDS AND RELATED PUBLICATIONS

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SITE AND EXTERNAL EVENTS DESIGN (SEED) GUIDELINES FOR THE PREPARATION AND CONDUCT OF SEED MISSIONS

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IAEA SERVICES SERIES No. 42

SITE AND EXTERNAL EVENTS DESIGN (SEED) GUIDELINES FOR THE PREPARATION AND CONDUCT OF SEED MISSIONS

INTERNATIONAL ATOMIC ENERGY AGENCY
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FOREWORD

The safety review services of the IAEA are important mechanisms for supporting Member States in enhancing the safety of nuclear installations during the site evaluation, design, construction and operational stages of a nuclear project. The review services are also useful tools for Member States to exchange experience and apply good international practices in enhancing global nuclear safety.

Site and External Events Design (SEED) review missions are conducted to provide safety reviews to Member States going through the different stages of site evaluation and design and assessment of nuclear installations against site specific external hazards. They provide an objective assessment of the nuclear project's conformity with IAEA safety standards and guidance, and of the effectiveness of the organizations performing the work. The scope of a review mission normally includes a wide range of safety issues relating to site and external events design. Radiological environmental impact assessment and application of management systems for site evaluation, design and assessment of nuclear installation against external events are also included in the review. The review process directly draws upon the wide ranging international experience and expertise of the members of the safety review team. Through the process of review and discussion, opportunities to enhance safety are identified and explored.

The Fundamental Safety Principles (IAEA Safety Standards Series No. SF-1) provide the basis for IAEA safety standards and the IAEA's safety related programmes. To support effective site evaluation and design and safety assessment against site hazards, the IAEA has also issued IAEA Safety Standards Series No. SSR-1, Site Evaluation for Nuclear Installations, and its associated Safety Guides. These safety standards form the core components of a SEED review mission.

A Member State counterpart for a SEED review mission can be the nuclear regulatory body; however, the review process is primarily designed to be performed with a licensee (e.g. the operating organization of an installation), or, in the early stages, with the party responsible for site survey and site selection. During a review mission, recommendations and suggestions are offered to the counterpart: recommendations are related to items of direct relevance to safety as referenced in IAEA Safety Requirements and Safety Guides, while suggestions are not related to compliance with the applicable IAEA safety standards but may enhance safety and performance. Additionally, good practices implemented by the counterpart that may be identified during the review are documented.

The guidelines presented in this publication are primarily intended to inform Member State counterpart organizations about the process of a SEED review mission. The guidelines provide useful information to the organization responsible for site evaluation activities and design and safety assessment of nuclear installations against external hazards while carrying out their own self-assessments of conformance with IAEA safety standards. The structure of providing individual modules allows the scope of the review to be tailored, at the request of the host organization. The guidelines also assist the review team in the planning and conduct of a mission or follow-up mission.

The IAEA officers responsible for this publication were O. Coman and A. Altinyollar of the Division of Nuclear Installation Safety.

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1. INTRODUCTION

1.1. BACKGROUND

The Safety Review Services of the IAEA support Member States in enhancing safety of nuclear installations during the site evaluation, design, construction and operational stages of a nuclear project. The IAEA's Safety Review Services are also useful tools for Member States to exchange experience and apply good international practices in enhancing global nuclear safety. Site and External Events Design (SEED) review missions are conducted to provide safety reviews in respect of site-specific external hazards. They provide an objective assessment of conformity of the nuclear project with IAEA safety standards, as well as of the effectiveness of the organizations performing the work. Radiological environmental impact assessment and application of management system in siting and site evaluation are also included in the review. The review process directly draws upon the wide-ranging international experience and expertise of Safety Review Team (SRT) members.

The main purposes of a SEED review mission are to conduct reviews of proposed technical areas, either at the Member State counterpart organization's location or in special cases at the IAEA Headquarters in Vienna, and to assist the counterpart in the application of the IAEA Safety Requirements, Safety Guides and good international practices. By verifying appropriate application of the IAEA safety standards and international practices, the review missions permit a consistent and uniform assessment of nuclear installation safety against external hazards.

SEED review missions are requested by the Member State counterparts when it is appropriate to assess conformance with IAEA safety standards with respect to specific technical areas or at key stages in the overall progress towards completion. Thus, SEED review missions are structured in a modular format to permit reviews of discrete aspects of site evaluation and design of new nuclear installations, as well as the assessment and re-evaluation of structures, systems and components (SSCs) of existing installations against external hazards during the different stages of a nuclear project. It is necessary for the counterpart to present the potential scope of the review and the administrative needs. The scope of the review is adjusted to the relevant stage of nuclear power or other nuclear installation programmes. When identifying the scope, it is important to take all safety-related issues of the specific stage into consideration. The stages of a nuclear installation that could be within the scope of a SEED mission are siting, design, construction, commissioning and operation. The scope, objectives, modules and technical disciplines to be covered by the review programme are agreed in advance and documented in the Terms of Reference for the mission.

SEED review missions were originally designed to be applied to nuclear power plants; however, SEED review missions can be applied to any nuclear installation type, using a graded approach that adapts the level of detail and other aspects of the review to the particular type of nuclear installation being reviewed.

1.2. USERS

The primary intended users of this publication are the Member State counterparts as well as the SRT members (IAEA staff and external experts) assigned to perform a SEED review mission.

1.3. COUNTERPART ORGANIZATIONS

A counterpart for a SEED review mission can be the nuclear regulatory body; however, the review process will include participation of the licensee (i.e. the operating organization of an installation), or, at early planning stages, a party responsible for site survey and site selection for an installation.

Other counterpart organizations may include relevant governmental, engineering, design, technical support organizations (TSOs), and owner/operators.

1.4. USE OF THE GUIDELINES

This publication describes the activities to be undertaken by the SRT leader, the SRT members, and members of the Member State counterpart in implementing a SEED review mission. Roles, responsibilities and the review modules are also described. The scope of the modules includes review of site and design safety regulations, review of the site selection process, site evaluation review, environmental impact assessment review, site monitoring review, and safety review of SSCs against external hazards.

These guidelines are primarily intended for the use of Member State counterpart organizations, to inform them about the process of a SEED review mission. The guidelines provide useful information to the organization(s) responsible for site evaluation activities and design safety of nuclear installations against external hazards, while carrying out their own self-assessments of conformance with IAEA standards. The individual module structure allows the scope of the review to be tailored by the counterpart to their needs at the time of request for a SEED review mission. The guidelines also assist the SRT in planning and conducting a mission or follow-up mission.

1.5. SEED MISSION WITHIN THE FRAMEWORK OF THE PROJECT DEVELOPMENT STAGE

SEED review missions address the siting stage and site evaluation stages in the lifetime of a nuclear installation, as illustrated in Fig, 1. Also they include design and safety assessment review against external hazards. The content of the modules varies, both in focus and depth, depending on the stage of the programme at the time of the mission. In some cases, multiple modules can be implemented during a single mission.

It is beneficial to request a SEED review mission in the early stage of a nuclear power or other nuclear installation programme. Early reviews facilitate an overview of the progress of the nuclear project so that the Member State counterparts can undertake timely corrective actions if necessary. Later SEED missions, or follow-up missions, can be focused on specific issues or areas of interest. Feedback from SEED missions that are performed prior to design and construction of the nuclear installation can be used by the counterpart to make informed design choices such as including special features that may minimize the impact of external hazards on nuclear installation safety at the site.

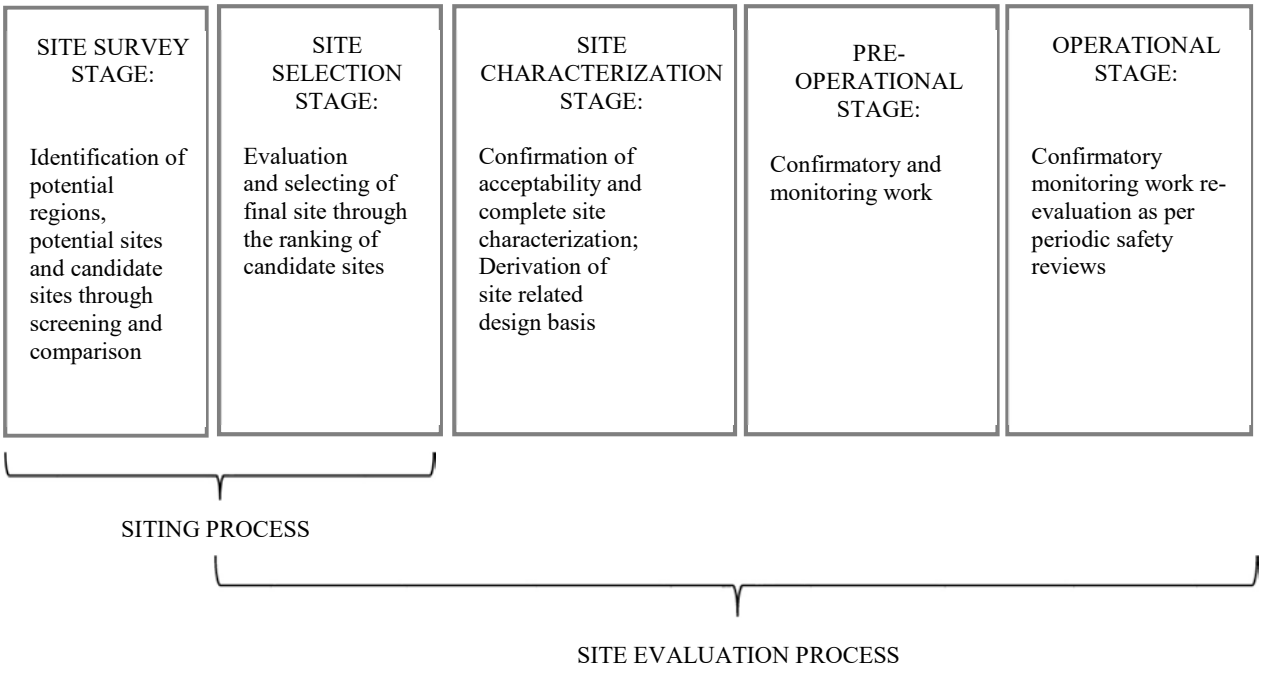

FIG. 1: Stages in the siting process and site evaluation process in the operating lifetime of a nuclear installation (from SSG-35 [1]).

1.5.1. SEED missions conducted during site selection and evaluation

A SEED mission related to site selection, site characterization, and/or external hazard evaluation is an integrated, multidisciplinary review that provides the counterpart with an independent review based on IAEA safety standards and addressing:

- The adequacy and level of detail for site selection and appropriateness of the selection of exclusion, suitability and ranking criteria;
- The adequacy and level of detail in site investigation in establishing the appropriate estimate of specific external hazards at the site during the lifetime of the installation;
- The level of detail necessary to understand the impact of the installation on the environment;
- The derivation of site related design parameters;
- Application of the management system for siting and site evaluation activities.

1.5.2. SEED missions conducted during design and construction

A SEED review mission performed during the design and construction stages typically focuses on the following:

- General conformity to the relevant IAEA safety standards;
- External hazards design criteria, analysis methodologies, construction practices;
- Qualification of SSCs;
- Application of the management system including quality assurance and working procedures.

1.5.3. SEED missions conducted during operation

The nature and impacts of external hazards may change with time and this can affect the safety assessment and conclusions. As stated in Requirement 29 of SSR-1 [2], "All natural and human induced external hazards and site conditions shall be periodically reviewed by the operating organization as part of the periodic safety review and as appropriate throughout the lifetime of the nuclear installation, with due account taken of operating experience and new safety related information". A periodic safety review confirms that the information and conclusions relevant to safety of the installation remain valid or concludes what necessary modifications and updates need to be made. A SEED review mission may be requested during the installation's operational stage for situations such as the following:

- When information on external hazards has changed or evolved or is being reassessed;
- To provide a supplementary and independent assessment following a significant event at the site, including discovery of a safety deficiency in the design against external hazards;
- To provide a supplementary and independent assessment following the issue of new Member State regulatory requirements or when significant changes to Member State regulatory requirements are issued that require a re-evaluation of the site, installation or procedures (e.g. the standards, requirements and criteria have substantially evolved and current international practices in site evaluation and design are different from those used at the time of the original evaluation);
- When experience from other installations leads to 'lessons learned' that are appropriate for the installation in question;
- When the need for a periodic safety review of the nuclear installation has been identified.

1.6. STRUCTURE OF THIS PUBLICATION

Section 2 provides an overview and introduction to SEED review missions, including objectives, scope, and description of the review modules. Section 3 describes the overall SEED review mission process. Section 4 provides guidance for the SEED review mission preparatory phase. Section 5 provides guidance for conduct of the mission, including the approach to the review. Section 6 provides guidance regarding mission documentation and reporting. Section 7 contains guidance about SEED review follow-up missions. Annex I describes the details of the modules that serve as the basis for SEED review missions. Annex II provides an example of the Terms of Reference. Annex III describes the preparatory meeting for a SEED review mission. Annex IV provides a typical programme/agenda for a SEED review mission. Annex V provides a typical IAEA checklist for SEED review mission preparation. Annex VI summarizes the responsibilities of the mission team participants. Annex VII provides an example of a standard format for the SEED review mission report including an issue sheet.

2. OVERVIEW OF THE SEED REVIEW SERVICE

2.1. OBJECTIVE OF THE SEED REVIEW SERVICE

The primary objective of the SEED review service is to support Member State counterparts in achieving a high level of protection of nuclear installations against external hazards based on implementation of the IAEA safety standards.

2.2. SCOPE OF THE SEED REVIEW SERVICE

The scope of the SEED review service is presented in Fig. 2. The SEED modules are designed to be tailored to the counterpart's needs considering the different stages of development of the nuclear project. The modular format is based on the IAEA safety standards, experience from past SEED review missions, lessons learned from recent events, and counterpart feedback from prior review missions.

SEED REVIEW MODULES

Module 1 – Review of Site and Design Regulations

Sub-Module 1.1: Regulations for Site Safety Evaluation

Sub-Module 1.2: Regulations for Design Safety against External Hazards

Sub-Module 1.3: Regulations for Safety Assessment against External Hazards

Module 2 – Review of the Site Selection Process

Sub-Module 2.1: Application of Management System for Site Selection

Sub-Module 2.2: Review of the Site Survey and Site Selection Processes

Module 3 - Site Evaluation Review

Sub-Module 3.1: Application of Management System for Site Evaluation

Sub-Module 3.2: Review of the Screening and Detailed Evaluation of External Hazards

Sub-Module 3.3: Review of the Site Evaluation Report

Module 4 – Environmental Impact Assessment (EIA) Review

Sub-Module 4.1: Application of Management System for Radiological EIA

Sub-Module 4.2: Review of Radiological EIA Report

Module 5 – Site Monitoring Review

Sub-Module 5.1: Pre-Operational Stage Monitoring Programme Review

Sub-Module 5.2: Operational Stage Monitoring Programme Review

Module 6 - Safety Review of Structures, Systems and Components against External Hazards

Sub-Module 6.1: Review of Design of Nuclear Installations against External Hazards;

Sub-Module 6.2: Review of Safety Evaluation of Nuclear Installations against External Hazards; and

Sub-Module 6.3: Review of External Event Probabilistic Safety Assessment (PSA)

FIG. 2: Detailed modular structure of the SEED review service

2.3. BASIS FOR REVIEW

The basis for the review of technical issues is the set of IAEA safety standards, which reflect an international consensus on what constitutes a high level of safety for protecting people and the environment from harmful effects of ionizing radiation. They are issued in the IAEA Safety Standards Series, which has three categories:

- Safety Fundamentals;
- Safety Requirements;
- Safety Guides.

The Safety Standards consist of the Safety Fundamentals as well as the applicable General Safety Requirements, with a graded approach to address all facilities and activities, complemented by a set of Specific Safety Requirements relating to facilities and activities. The Safety Requirements are implemented through a corresponding set of general and specific Safety Guides.

Safety Fundamentals SF-1[3] is at the highest level of the IAEA Safety Standards Series. It establishes the fundamental safety objective and principles of protection and safety and provides the basis for the safety requirements.

An integrated and consistent set of Safety Requirements establishes the requirements that are to be met to ensure the protection of people and the environment, both now and in the future. The requirements are governed by the objective and principles of the Safety Fundamentals [3]. If the requirements are not met, measures need to be taken to reach or restore the required level of safety. The format and style of the requirements facilitate their use for the establishment of a national regulatory framework in a harmonized manner. Safety requirements use 'shall' with statements of associated conditions that are required to be met.

As a part of Safety Standards Series, Safety Guides provide recommendations and guidance instructing how to fulfil the safety requirements, while indicating an international consensus that makes the recommended measures (or equivalent alternative measures) necessary. The Safety Guides present international good practices, and increasingly reflect best practices, to help users striving to achieve high levels of safety. The recommendations provided in Safety Guides are expressed as 'should' statements.

SEED review missions apply the latest available revision of the IAEA Safety Requirements and Guides. The particular safety standards that are used in the various SEED modules are listed in Annex I of these Guidelines. Information provided in IAEA TECDOCs and Safety Reports may provide useful examples of current practice, in connection with the recommendations stated in the Safety Guides, although they are not specifically used in the SEED review mission.

3. THE SEED REVIEW MISSION PROCESS

The SEED review mission process is presented in Fig. 3. It consists of the following phases, which are described in greater detail below and in the following sections:

- Initial request by the Member State counterparts;
- Preparatory phase;

- Conduct of the review mission;
- Post mission activities, including finalization of the mission report;
- Follow-up mission.

3.1. COUNTERPART REQUEST FOR SEED REVIEW MISSION

A SEED review mission begins with an official governmental request (normally by the National Liaison Officer) to the IAEA that is conveyed through the Department of Technical Cooperation (TC) or to the External Events Safety Section (EESS) of the Department of Nuclear Safety and Security. The request indicates the tentative scope and date of the mission, any specific aspects to be included, the Member State funding, and identification of the designated contact person who will act as the official Member State liaison person for the SEED review mission. The request package may include the Member State self-assessment report and other Member State relevant information.

If the request was conveyed through TC, the assigned Programme Management Officer (PMO) reviews the request and, if needed, obtains further clarification from the requesting institution. The financial arrangements, including the source of funding (TC funding, extra-budgetary contributions and Member State cost sharing), are identified.

The TC/PMO transmits the Member State request to the EESS Section Head. The EESS Section Head assigns a Technical Officer (TO) (who might already have been assigned by the EESS Section Head for the Member State), evaluates the request and determines whether the SEED review mission can proceed. If the scope, objectives, dates and the financial arrangements are appropriate and feasible, the TO and the PMO, starts implementation of the SEED review mission.

3.2. PREPARATORY PHASE – TERMS OF REFERENCE

The TO as SRT leader contacts the counterpart organization to:

- Identify the contact person of the counterpart for the mission;
- Develop the draft Terms of Reference;
- Arrange a date for the preparatory meeting with the organization(s) involved;
- Discuss the scope and expectations for a self-assessment by the counterpart organization itself in preparation for the review mission.

The content of the Terms of Reference is presented in Section 4.

3.3. CONDUCT OF THE MISSION

The review mission is normally conducted at the counterpart organization’s facilities. It includes the technical interactions between the SRT members (i.e. reviewers) and the counterpart and its experts, associated meetings and preparation of the preliminary mission report. Details are described in Section 5.

3.4. POST-MISSION ACTIVITIES

The post-mission activities include the preparation of the final mission report, dissemination of the mission report to the counterpart and support for the counterpart in the preparation of action plan. Details are described in Section 6.

3.5. FOLLOW-UP MISSIONS

Depending on the conclusions and recommendations of the review mission, one or more follow-up missions are recommended, as described in Section 7.

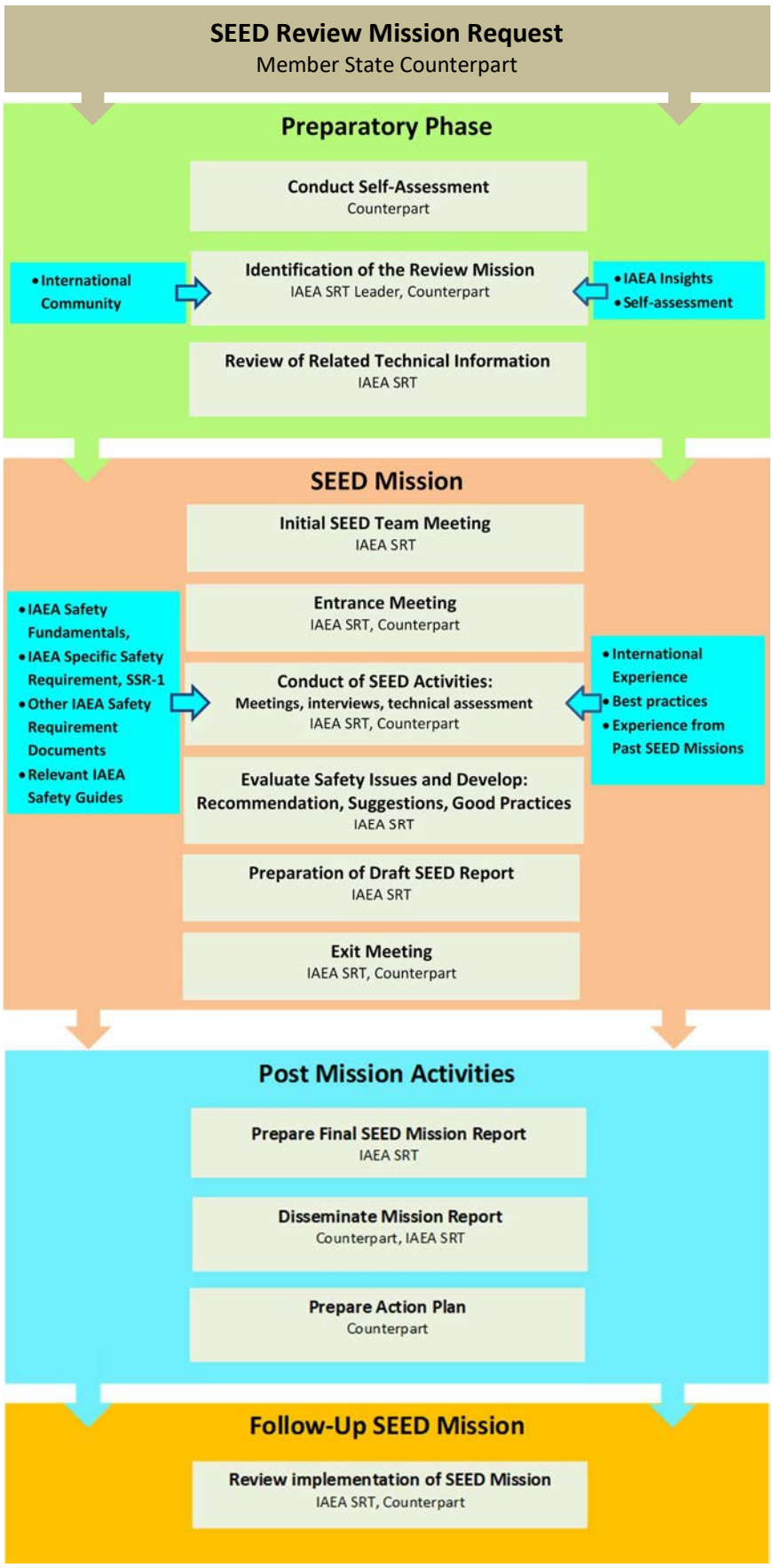

FIG.3: SEED review mission process

4. PREPARATION FOR A SEED MISSION

The preparatory phase may include, as applicable:

- Development of agreed Terms of Reference between the IAEA and the counterpart for the proposed SEED review mission;
- A preparatory meeting;
- Completion of a self-assessment by the counterpart, as appropriate;
- Delivery of the counterpart's advance reference documents to the IAEA;
- Selection of the SRT;
- Review of documents and advance preparation by the SRT;
- Preparation of a questionnaire by the SRT and communication to the counterpart in advance to facilitate discussions during the mission.

The SEED review is performed by an SRT that consists of IAEA staff and external experts with relevant knowledge and experience in the selected SEED module(s), recruited from Member States and selected by the IAEA in consultation with the counterpart. The SRT is led by an IAEA staff member designated as the SRT leader.

The SRT leader is responsible for preparing a Terms of Reference document that presents all of the information necessary to implement the mission. After it is prepared in collaboration with the contact person of the counterpart and approved by the IAEA and the counterpart, the SRT leader distributes the Terms of Reference to the SRT members. The Terms of Reference may be revised as necessary, in agreement with the IAEA and the counterpart, until the implementation of the SEED mission.

The SRT leader and the contact person of the counterpart establish the detailed mission scope and objectives and select the SEED module(s). In some cases, some pre-identified issues are available from previous IAEA mission reports. In other cases, a list of issues is not available because of the special objective of the review mission. In general, it is recommended that the review be carried out based on a pre-selected list of issues and SEED module(s), paying due regard to the IAEA action plan for the country (if the country is receiving IAEA assistance), to guarantee good coverage of the topic to be reviewed and to provide a higher level of efficiency in conducting the mission.

The most relevant IAEA publications (or references to international practices in the field) to be applied in the review are also specified in the Terms of Reference.

The agenda for the mission is developed by the SRT leader and agreed with the counterpart. The agenda needs to provide adequate time to review documents (those not supplied in advance), to carry out a site visit or walkdown (as appropriate) and to conduct interviews with the counterpart's own experts and consultant experts. A typical programme for a SEED review mission is provided in Annex IV.

If a site visit or walkdown is included, the need for local experts is discussed and agreed (e.g. experts who investigated the site or who manage plant engineering and/or operational support personnel able to answer specific questions during the mission). The need for construction personnel, operations personnel and maintenance personnel for access to equipment and to generally restricted areas is discussed and agreed as well.

The SRT leader is also responsible for the implementation of security requirements in accordance with the United Nations security level imposed in the region.

The SRT leader provides the contact person of the counterpart with the logistical requirements for the implementation of the review mission (e.g. meeting rooms and their equipment, computers, communication systems), as well as for the site visit and installation walkdown, if appropriate. In the latter case, the SRT leader makes arrangements for providing the SRT members with dosimeters, when necessary.

The counterpart is responsible for completing additional necessary logistical arrangements, including establishing the hotel, meeting rooms and related facilities, access to the site and installation, participation of counterpart engineering and scientific discipline personnel, transportation, secretarial and interpreter services, and contacts with the owner/operator as appropriate.

The Terms of Reference describe the scope of the self-assessment as agreed between the SRT leader and contact person of the counterpart. Further information on the self-assessment is provided in Section 4.3.

The SRT leader discusses and establishes with the contact person of the counterpart the list of advance reference documents (material to be reviewed in advance of the mission). The advance reference documents include the identified technical data and reports related to the selected module(s).

4.1. PREPARATORY MEETING

A preparatory meeting lasting two to three days is conducted between SRT leader and the contact person of the counterpart, ideally about two to six months in advance of the main SEED mission, depending on the mission scope. The meeting may also include additional IAEA staff, depending on the complexity of the mission, and one or two SRT members if necessary.

The preparatory meeting is held at the counterpart organization's location to allow the participation of senior management and other stakeholder organizations. During the preparatory meeting, it may be appropriate to include a site visit. In certain unique cases or situations, the mission can be conducted at the IAEA headquarters.

The main purpose of the preparatory meeting (or other preparatory arrangements, if a meeting is not deemed necessary) is for the SRT leader to:

- Meet with counterpart staff and senior management and exchange contact details;
- Inform the counterpart's staff and senior management how the SEED review process works;
- Clarify questions about IAEA terminology and requirements, as necessary;
- Explain the roles and responsibilities of the SRT members and the way they interact with the individuals within the counterpart and other organizations;
- Explain the role of the counterpart during the review;
- Discuss and confirm the scope, date, agenda, number and profile of SRT members, plans for a site visit, the advance reference documents to be provided by the counterpart and reporting requirements;
- Prepare a detailed action plan and draft an agenda for the review meeting;
- Agree on an outline schedule for the mission;
- Agree on the logistical requirements;
- Explain IAEA policies, e.g. funding, contact with the media;
- Answer questions from the counterpart staff and address their concerns.

All the information discussed and confirmed during the preparatory meeting is included in the Terms of Reference.

A three-month period after the preparatory meeting may be needed to enable the counterpart organization to complete its preparation for the SEED review mission, including translation of necessary documents into English, as required.

Since SEED review mission topics vary in complexity, it is very important to clearly identify the scope of the review mission. The modules presented in Annex I serve as the structure for identifying which topics to include in a particular review mission.

A SEED review mission is typically 3 to 10 working days in duration and includes teams comprising 3 to 10 SRT members. The size of the SRT and the duration of the review mission are dependent on:

- The range and complexity of the technical issues to be addressed;
- The amount of documentation to be reviewed;
- The range of installations, activities and practices that are included in the scope of the SEED review mission;
- The availability and current validity of earlier IAEA review mission reports and/or personnel that might contribute relevant information to the current review;
- The ability of SRT members to speak the local language and the availability of interpreters provided by the counterpart.

The main elements of the preparatory meeting are detailed in Annex III. A typical programme/agenda for a SEED review mission is provided in Annex IV. A checklist that may be useful during the preparatory phase is provided in Annex V.

4.2. SCOPE OF THE MISSION

In the preparatory stage of SEED review missions, the IAEA assesses the appropriateness and the feasibility of conducting a review mission based on the technical and administrative background information presented by the counterpart. The SEED review mission concludes with recommendations regarding the site and/or design safety based on the relevant IAEA safety standards. Therefore, it is necessary for the SEED review mission to include a sufficiently wide range of technical topics of safety significance. In general, the scope of the SEED review mission addresses the stage (siting, site evaluation, design, construction, operation) of the nuclear power or other nuclear installation programme. The SEED modules and sub-modules are presented in Annex I.

Follow-up missions are also recommended, as described in Section 7.

It is important to note that SEED review missions are not intended to provide Member States with assistance in enhancing technical capabilities. In cases where such assistance is necessary, expert missions, advisory missions, national workshops or other forms of capacity building services can be implemented.

4.3. SELF-ASSESSMENT AS PART OF THE SEED REVIEW

Self-assessment is an integral part of the SEED review process and is expected to be conducted by the counterpart in preparation for the SEED review mission. The objective of the self-assessment is to allow the counterpart to analyse its own progress in conforming to the IAEA safety standards of the scope of the review mission. The scope and complexity of the self-assessment is dependent on many factors. The form and content of the self-assessment need to be agreed between the SRT leader and the counterpart. The self-assessment may take different forms, such as a detailed review by the counterpart of its programme with respect to the IAEA standards or preparation by the counterpart of responses to a questionnaire provided by the review team after its analysis of the advance reference documents.

Self-assessments prepare the counterpart to engage in meaningful discussions with the SRT by ensuring familiarity with the IAEA requirements and terminology used in the review mission. If conducted independently by the counterpart, the self-assessment is provided to the IAEA staff participating in the SEED review mission in advance of the meeting to provide comprehensive information from the counterpart's perspective. In some cases, the self-assessment could be limited to preparing answers to questions asked by the review team based on the review of the advance reference documents. The scope and level of detail of the self-assessment is agreed by the SRT leader and the counterpart's representatives at the preparatory meeting.

4.4. ADVANCE REFERENCE DOCUMENTS

The SRT leader discusses and establishes with the counterpart the list of advance reference documents (material to be reviewed by the review team in advance of the visit). Whenever possible, the advance reference documents include the identified technical data and reports related to the selected module(s). Good quality, comprehensive written material provided by the counterpart improves the efficiency of the reviews, facilitates preparation of the mission report, minimizes risk of misunderstanding and helps focus on the areas considered important by the Member State.

Documents that need to be translated into English are agreed. Information that is necessary to be kept confidential needs to be identified and clearly marked as such.

Relevant advance reference documents may include the following:

- Management system documents including organizational structure, QA programme, etc.;
- Site survey and selection reports;
- Site evaluation reports;
- Radiological environmental impact assessment reports;
- Assessment reports on specific issues;
- Relevant section of preliminary analysis report;
- Evaluation criteria used by the regulatory body;
- Self-assessment analysis and results.

The advance reference documents of the initial mission can be retained by both the counterpart and the IAEA for further use and comparative review during the follow-up mission and future missions associated with other modules.

4.5. MISSION LOGISTICS

The necessary logistical arrangements are identified by the SRT leader and are the responsibility of the counterpart to arrange, as described in the Terms of Reference.

4.6. RESPONSIBILITIES OF MISSION PARTICIPANTS DURING THE PREPARATORY PHASE

The mission participants include the SRT and the contact person of the counterpart and members of counterpart organization. In case a media contact is needed, public communications staff of the IAEA will also participate in the mission. The roles and responsibilities of the mission participants are summarized below, and further details are provided in Annex VI.

4.6.1. SRT leader

The SRT leader is an IAEA staff member who is a professional in the relevant technical discipline. The SRT leader is selected by the EESS Section Head. The personal qualifications and characteristics of the SRT leader are important in ensuring the success of a mission.

4.6.2. SRT members

The SRT is a multi-disciplinary team of individuals with expertise in all the engineering and scientific disciplines required for the review. The SRT members need to be familiar with the IAEA safety standards relevant to the review mission and with the SEED guidelines. The SRT members are intended to remain involved until the review is completed, to provide continuity and efficiency for subsequent missions.

4.6.3. Contact person of the counterpart

The counterpart organization (as described in Section 1) nominates an individual to serve as contact person of the counterpart. This individual needs to be knowledgeable on all matters relating to the SEED review mission and have a good understanding of what the counterpart has provided with respect to the modules being reviewed, as well as a good overview of the counterpart organization. The contact person of the counterpart needs to be able to access the necessary resources and have credibility with the staff of the counterpart organization. The contact person of the counterpart preferably remains unchanged during all the phases of the review process.

4.6.4. Counterpart members

The counterpart members are selected to provide the maximum effectiveness in the implementation of the review mission. For each safety topic to be covered, knowledgeable specialists need to be nominated sufficiently in advance, so they have the necessary time to prepare for the review. Technical participants who have participated in performing the work being reviewed have overlapping expertise to assure complete, in-depth coverage of the scope of safety issues to be addressed. Members of a TSO who took active part in the tasks to be reviewed need to be invited, to improve effectiveness of the review.

5. CONDUCT OF THE SEED REVIEW MISSION

The conduct of the SEED review mission may include, as applicable:

- A team briefing meeting;
- An entrance meeting;
- Conduct of SEED review mission activities including meetings, interviews, technical assessment;
- Evaluation of safety issues and development of issue sheets;
- Preparation of draft SEED review mission report;
- An exit meeting.

5.1. TEAM BRIEFING MEETING

When all the SRT members have arrived, the SRT leader will hold a short briefing meeting with the SRT to review the objectives and scope of the mission, applicable standards, codes of conduct, and report content and format. Sharing of responsibilities among the SRT members also needs to be very clear, possibly based on the technical issues to be covered, and needs to ensure that there is no gap in the review activities.

The SRT leader will also brief the team on issues, priorities, schedule, approach and expectations regarding the format and content of the deliverables by the SRT members. SRT members will also report their first impressions of their subject area based on their review of the advance reference documents. The SRT leader will remind the team of the need to complete and agree on the preliminary mission report before the end of the mission.

5.2. ENTRANCE MEETING

An entrance meeting will be conducted with senior management of the counterpart and involved organizations, for the purpose of orientation and general introductions. At the meeting, the SRT will present the primary objectives and expectations for the mission. The SRT leader provides a brief outline of the objectives, scope, and expectations for the mission, emphasizing that it is not an inspection, but will be conducted as a review in cooperation with the relevant counterpart. The counterpart members may present the status of their programme, and their primary objectives and expectations for the mission.

5.3. REVIEW METHODS

The SRT uses four methods to acquire the information needed to develop their recommendations and suggestions, as set out in each SRT member’s working notes.

These four methods are:

- Review of written material and databases;
- Direct observation of performance, status and activities;
- Discussion and interviews;
- Discussion of evaluations and tentative conclusions within the team and with counterpart members.

The use of these review methods needs to be carefully planned in advance for each day. Arrangements need to be made with the counterpart regarding how to perform the discussions, interviews and observations.

The SRT has daily meetings in which the SRT members present their findings, summarize their concerns developed during the day, and discuss potential issues. This creates an opportunity for other SRT members to contribute their views, further strengthening the experience basis of the review team used for the evaluation. It is important that each SRT member comes to the meeting prepared to make a concise statement of his/her findings, in order to allow the other review areas to be discussed at the same meeting.

Similarly, good practices discovered during the process of the review are described in the working notes in detail for the benefit of other Member States. Based upon the discussions and observations, the SRT member can, if necessary, modify his/her preliminary view. One or more iterations may be required for document review, discussions, interviews, and observations in order to gain sufficient facts to form a judgment.

5.3.1. Review of written material

Documents of general interest to the whole team are included in the advance reference documents. Specific information on a given area that is to be reviewed by the responsible SRT member may be provided in advance or may be requested during the on-site visit.

5.3.2. Direct observations

Direct observation is carried out during the site visit and installation walkdowns within the scope of the review mission.

5.3.3. Discussion and interviews

The SRT will conduct discussions and interviews with the counterpart members with the aim of:

- Obtaining additional information not covered by the documentation;
- Getting answers on questions, and clarifying concerns arising out of the documentation review;
- Obtaining in-depth clarification if needed;

The discussions and interviews are useful for providing an opportunity for exchanging important information between SRT members and counterpart members. These interviews are based on open questions and not an interrogation of the counterpart members by the SRT members.

Properly conducted, these discussions and interviews are possibly the most important part of the SEED review mission.

5.3.4. Discussion of evaluations and tentative conclusions with counterpart members

Based on facts identified during previous review steps, the SRT members develop tentative conclusions (e.g. preliminary recommendations and suggestions, good practices) that are to be discussed and clarified with counterpart members.

5.4. DEVELOPMENT OF ISSUE SHEETS

The SRT members collect facts and provide conclusions with the aim of defining fundamental overall problems. If agreed within the SRT members, the SRT members further develop the issue description and document it on an issue sheet. The outline of an issue sheet is described below. A template for an issue sheet is provided in Annex VII.

Each issue sheet consists of the following sections.

- Issue identification;
- Issue clarification;
- Counterpart views;
- Assessment by the SRT.

If, as an outcome of a follow-up mission, a new safety issue appears, a new issue sheet is generated. Issue sheets are numbered in sequential order for later reference.

5.5. WORK WITH THE COUNTERPART MEMBERS

The work with the counterpart members involves the following activities:

- Entrance meeting;
- Daily review sessions;
- Debriefing;
- Exit meeting

During the entrance meeting with the counterpart members, the organization and plans for conducting the review are presented and working teams for every area need to be established. The working teams in each area consist of the SRT members and counterpart members.

The schedule of activities may need to be updated daily and discussed with the counterpart members. The SRT informs the counterpart members of the preliminary findings and the counterpart members acknowledge the findings.

The day before the exit meeting, SRT members deliver to the SRT leader their parts of the mission report, which already have been discussed with the counterpart representatives A formal exit meeting is held on the last day of the mission. At the exit meeting, all the SRT members provide short conclusive statements summarizing recommendations, suggestions and good practices.

During the mission, the results of the preliminary reviews of the reference documents and the self-assessment will be discussed with the counterpart members. The technical exchanges with the counterpart members represent the basis for identified findings and associated recommendations.

5.6. DAILY TEAM MEETINGS

At the end of each day, the SRT leader holds a short meeting with the SRT. The purpose of this meeting is to discuss the main findings of the day and the progress of the mission.

5.7. SITE VISIT

Typically, the purpose of a site visit is to allow the review team to observe locations at which field observations and measurements have been made. These may include geological mapping, specific fault exposures, seismograph stations and boreholes. Because of limited time and often difficult field logistics, it is always necessary to carefully plan the site visit to optimize its benefit for the review.

5.8. INSTALLATION WALKDOWN

A walkdown of an existing installation is intended to provide information regarding the areas of most concern relevant for the mission's scope and objectives. This preliminary approach reviews briefly one or more of the actions conducted during the detailed installation walkdowns conducted as part of general installation re-evaluation programmes.

Documentation of the walkdown includes field notes, photographs, annotated drawings for the 'as-built' or 'as-is' conditions, etc. A summary of these items is included in the mission report.

5.9. PRELIMINARY MISSION REPORT

The SRT leader will compile a preliminary mission report including the main findings and conclusions based on inputs from the SRT members. This preliminary mission report is presented during the exit meeting. Therefore, it is important that the mission schedule allows sufficient time for the team to review and agree on significant points and for the counterpart members to review the preliminary report in advance of the exit meeting. The counterpart members are invited to comment on the preliminary report for technical accuracy and to obtain a common understanding of the results reported. Conclusions and recommendations included in the preliminary report are in a reasonably finalized stage by the close of the mission; i.e. no new conclusions or recommendations can be added to the report following the exit meeting.

At the end of the mission, a copy of the preliminary report is provided to the counterpart members. Previous missions have indicated that timely delivery of the preliminary report can be a challenge, so it is important this aspect receives appropriate attention by the SRT leader.

5.10. EXIT MEETING

The mission concludes with an exit meeting. The purpose of this meeting is to convey the principal conclusions and recommendations resulting from the review, as they are stated in the preliminary mission report.

The SRT leader proposes to the counterpart the appropriate time to hold the exit meeting. Before convening the exit meeting, the following points need to have been completed:

- Each SRT member has reached tentative conclusions for those technical areas of the mission for which he/she is responsible;
- The SRT leader ensures that the preliminary report is factually correct and presented to all parties.

The preliminary mission report is provided to the contact person of the counterpart during the exit meeting.

Representatives of all stakeholders are encouraged to attend the exit meeting.

5.11. ACTIONS COMMITTED TO BY THE COUNTERPART

To address the recommendations identified in the mission report, the counterpart is encouraged to develop a detailed action plan which, when implemented, will achieve conformance with the IAEA safety standards. The action plan will serve as the basis for a follow-up review mission, as appropriate. Details about follow-up missions are discussed in Section 7 of this publication.

6. POST MISSION ACTIVITIES – FINAL MISSION REPORT

The final mission report presents recommendations developed by the SRT members for use by the counterpart. The final mission report will contain only the clarifications necessary after the review of the preliminary report and receipt of the counterpart's comments.

6.1. PREPARATION OF THE MISSION REPORT

The SRT leader defines a structured process for the development of the mission report and is responsible for its implementation.

Within three months of completion of the mission, the final mission report is provided to the contact person of the counterpart. The final mission report is cleared through an internal process at the IAEA.

6.2. CONTENT OF THE MISSION REPORT

The general layout of the mission report and the contents of each section are as follows:

SUMMARY

The first section is a one-page summary primarily for use by the management of the counterpart and the IAEA. It includes the important aspects of the mission with emphasis on the framework under which the review is performed (e.g. an IAEA programme or an ongoing activity), its main conclusions and recommendations, and the major safety issues that were identified as result of the review service.

INTRODUCTION

The introduction presents the background for the mission including a short description, with references, of the main outcome from the previous missions. All previous reports in the same project (or for the same site, when applicable) need to be referenced here.

OBJECTIVES, SCOPE AND CONDUCT OF THE MISSION

Objectives and Scope

The objectives and scope are agreed in advance of the mission between the SRT leader and the counterpart and included in the Terms of Reference.

Basis and references for the review

This section provides the list of the documents provided by the counterpart, in advance of and during the mission, and reviewed by the SRT. The most relevant IAEA safety standards and other reference documents used for the review are also provided in a separate list.

Conduct of the Mission

This section includes details of the mission including schedule (day-by-day itinerary with meeting subjects, on-site visit and installation walkdown, if appropriate), locations and participants, and details of how mission was conducted according to the Terms of Reference (see Annex II).

MAIN CONCLUSIONS

Main conclusions and recommendations are presented in this section. The details of the issues and recommendations are presented in the issue sheets.

ASSESSMENT OF THE SAFETY ISSUES (ISSUE SHEETS)

In this section, the technical safety issues are presented. All the safety issues are presented in sequence and numbered, with a specific 'issue sheet' for each safety issue.

Each safety issue needs to have a clear reference to the relevant corresponding paragraph in the IAEA safety standards used for the review. If, as an outcome of a follow-up mission, a new safety issue appears with respect to the previous ones, a new issue sheet is generated. The issue sheet consists of the following parts:

i. Issue identification:

   This part indicates a number, title, revision number, date and other attributes of issue. The information is used for categorization and classification.

ii. Issue clarification:

   This part of the issue sheet describes the findings including reference to and quotation from IAEA safety standards. The section also includes references to the documents reviewed.

iii. Counterpart views:

   This section of the issue sheet records the response of the counterpart to the SRT, as well as the actions to be taken or intended to be taken in order to resolve the safety issue. This section is filled out by the counterpart or reflects the views of the counterpart if descriptions are completed by the SRT member.

iv. Assessment by the SRT (comments and recommendations) including the following sub-parts in issue sheet:

   4.1. Comments (numbered in a sequential order for further reference as 'C1, C2'…etc.): are intended to explain in detail the issue and the intent of the applicable safety requirements.
   4.2. Recommendations (numbered in a sequential order for further reference as 'R1, R2'… etc.), describe actions for resolving the identified issue.

v. Status of the issue at the time of the review: The final judgment of the SRT members on the resolution of the safety issue is reflected by the Resolution degree (RD) as follows (applicable for the follow-up missions):

- No action: No progress in the resolution of the issue, or unsatisfactory resolution.
- Action under way: The issue has been recognized and the counterpart has started to work to resolve it.
- Issue partially resolved: The implemented action meets partly but not fully the intent of the IAEA recommendation(s).
- Issue resolved: Satisfactory resolution, the issue is closed.

vi. For operating installations, it may be appropriate to identify an 'Urgency degree (UD)' as follows:

- The issue should be addressed urgently, before (indicate a key date and steps to be taken)
- The issue should be addressed before (indicate a key date)

A sample of a standard mission report format, including the Issue Sheet, is presented in Annex VII.

6.3. ADDRESSING THE SAFETY ISSUES

The SRT provides recommendations intended to show how to resolve the identified issues. In addition, the SRT may provide suggestions and highlight good practices. Recommendations, suggestions and good practice are defined below.

6.3.1. Recommendations

Recommendations are generated when:

a. the intent of the applicable IAEA Safety Requirements is inadequately addressed.
b. non-compliance with the applicable provisions of Safety Guides and thus insufficient evidence of meeting the intent of applicable safety requirements.

Recommendations need to be specific to the identified issue and aimed at improving the conformity to the applicable IAEA safety standards. Recommendations are formulated such that they are succinct and self-explanatory. They clearly specify the responsible party and use "should" language (for example, 'the operating organization should…').

6.3.2. Suggestions

The SRT may identify opportunities for improvements not directly related to non-conformity with IAEA safety standards. Suggestions may indirectly contribute to improvements in safety and are primarily intended to enhance performance.

A suggestion is either a proposal in conjunction with a recommendation or may stand on its own following a description of the associated background. Since suggestions are not related to compliance with the applicable safety standards, they are only documented in the mission

report and not included on issue sheets. Suggestions clearly specify the responsible party and use “should consider” language (for example, ‘the operating organization should consider…’).

6.3.3. Good practices

A good practice is identified in recognition of good performance superior to that generally observed elsewhere. A good practice is more than just the fulfilment of current requirements or expectations. It has to be worthy of the attention of other organizations as a model in the general drive for excellence. Good practices are documented in the mission report and not on issue sheets.

6.4. DISSEMINATION OF THE MISSION REPORT

When the report is finalized and approved, copies are sent to the TC PMO, SRT members, and to the counterpart and all the interested parties (as agreed with the counterpart).

The final mission report is initially issued as a restricted document to the counterpart through official channels. The report is kept restricted for the period of 90 days after the submission to the counterpart, after which it is derestricted unless the counterpart notifies the IAEA otherwise.

7. FOLLOW-UP SEED REVIEW MISSIONS

Follow-up SEED review missions are recommended. They are organized and conducted in a manner very similar to the main SEED review missions. However, the objectives and scope are generally restricted to assessing progress on actions by the counterpart to address the recommendations of the previous review mission. The counterpart is encouraged to request follow-up missions not only to assess the progress of actions related to previous missions, but also to address emerging issues that may impact site and external event design safety.

7.1. OBJECTIVES OF THE SEED FOLLOW-UP REVIEW MISSION

SEED follow-up missions are performed to assess the counterpart’s progress in implementing the recommendations from a SEED review mission. If requested by the counterpart, a SEED follow-up review mission may also include further reviews in specific areas.

The process of the follow-up mission, including preparation, conducting and reporting, is similar to that described in previous sections for the main SEED review mission.

REFERENCES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSR-1, IAEA, Vienna (2019).

[3] EUROPEAN ATOMIC ENERGY COMMUNITY, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, INTERNATIONAL MARITIME ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Fundamental Safety Principles, IAEA Safety Standards Series No. SF-1, IAEA, Vienna (2006).

ANNEX I: DETAILS OF THE MODULES

I-1. MODULE 1: REVIEW SITE AND DESIGN SAFETY REGULATIONS

I-1.1. INTRODUCTION

The primary intended counterpart for this module is the regulatory body, which is seeking feedback on conformance of national regulations for site evaluation and design of nuclear installations with the IAEA safety standards. The definition and terminology in the IAEA safety standards may differ from Member State regulations; however, this needs to be broadly understood to mean the requirements to which a licensee would be legally bound under the terms of a license. This means that Member State regulations could take the form of specific laws, regulations, regulatory requirements and in some cases, nationally implemented generic license conditions.

This module is an assessment as to whether the regulations that are in place are in aligned to the applicable IAEA safety standards.

This module has three sub-modules:

Sub-Module 1.1: Regulations for Site Safety Evaluation

Sub-Module 1.2: Regulations for Design Safety against External Hazards

Sub-Module 1.3: Regulations for Safety Assessment against External Hazards

I-1.2. OBJECTIVE

The primary purpose of all these sub-modules is to document and describe how the Member State's site and design related regulations are aligned to the applicable IAEA safety standards. The counterpart self-assessment is expected to demonstrate how each of the safety standards is addressed in its regulations.

I-1.3. SCOPE

This module covers regulations applicable to siting, site evaluation, design of new installations, safety re-evaluation of existing ones and probabilistic safety assessment of installations in relation to external event hazards. This includes regulations applicable to:

- All natural and hazards human induced hazards in site evaluation for nuclear installation;
- Radiological environmental impact assessment;
- Feasibility of planning effective emergency response actions;
- Design of SSCs in relation to design basis external events;
- Safety margin evaluation of SSCs for beyond design basis external events;
- Deterministic and probabilistic safety assessment in relation to all external event scenarios, of both natural and human induced origin, as generated outside the installation boundaries and by neighbouring installations.

I-1.4. APPLICABLE IAEA SAFETY STANDARDS

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Governmental, Legal and Regulatory Framework for Safety, IAEA Safety Standards Series No. GSR Part 1 (Rev. 1), IAEA, Vienna (2016).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSR Part 4 (Rev. 1), IAEA, Vienna (2016).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations, IAEA Safety Standard Series No. SSR-1, IAEA, Vienna (2019).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), IAEA, Vienna (2016).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Research Reactors, IAEA Safety Standards Series No. SSR-3, IAEA, Vienna (2016).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Fuel Cycle Facilities, IAEA Safety Standards Series No. SSR-4, IAEA, Vienna (2017).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series No. SSG-9, IAEA, Vienna (2010) (under revision)

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, External Human Induced Events in Site Evaluation for Nuclear Power Plants, Safety Standard Series No. NS-G-3.1, IAEA, Vienna (2002).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series, No. SSG-18, IAEA, Vienna (2011).

[11] INTERNATIONAL ATOMIC ENERGY AGENCY, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.2, IAEA, Vienna (2002).

[12] INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-21, IAEA, Vienna (2012).

[13] INTERNATIONAL ATOMIC ENERGY AGENCY, Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).

[14] INTERNATIONAL ATOMIC ENERGY AGENCY, Establishing the Safety Infrastructure for a Nuclear Power Programme, IAEA Safety Standards Series No. SSG-16, IAEA, Vienna (2012). (under revision)

[15] INTERNATIONAL ATOMIC ENERGY AGENCY, External Events Excluding Earthquakes in the Design of Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.5, IAEA, Vienna (2003) (under revision)

[16] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Design and Qualification for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.6, IAEA, Vienna (2003) (under revision)

[17] INTERNATIONAL ATOMIC ENERGY AGENCY, Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-3, IAEA, Vienna (2010).

[18] INTERNATIONAL ATOMIC ENERGY AGENCY, Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-4, IAEA, Vienna (2010).

I-1.6. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO THE MISSION

- Overview of the regulatory requirements related to site evaluation, design and safety assessment;
- Description of regulations and regulatory requirements as applicable.

I-2. MODULE 2: REVIEW OF THE SITE SELECTION PROCESS

I-2.1. INTRODUCTION

Siting is the process of surveying large regions in order to select a suitable site for a nuclear installation, and as such is a multifaceted process that is driven by safety considerations. The safety relevant part of that process aims at assessing those site related factors that ensure that the site–installation combination does not pose an unacceptable risk to individuals, the population or the environment over the lifetime of the installation.

This module has two sub-modules:

Sub-Module 2.1: Application of Management System for Site Selection

Sub-Module 2.2: Review of the Site Survey and Site Selection

I-2.2. OBJECTIVE

This module provides a review of the site selection process based on the relevant IAEA safety standards.

I-2.3. SCOPE

Sub-Module 2.1: Application of Management System for Site Selection

- Application of management system;
- Main processes used in site selection including data collection.

Sub-Module 2.2: Review of the Site Survey and Site Selection Processes

- Site survey and site selection processes;
- Screening criteria (exclusionary and discretionary criteria);
- Ranking criteria;
- Documentation of results.

A technical visit to one or more preferred sites may be organized during the review of the site selection process and results. It needs to be noted that neither site data nor hazard values will be assessed; instead, the SEED mission will assess the data collection process, database completeness and suitability and the use of the site selection process.

I-2.4. APPLICABLE IAEA SAFETY STANDARDS

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Leadership and Management for Safety, Series No. GSR Part 2, IAEA, Vienna (2016).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, The Management System for Nuclear Installations, Series No. GS-G-3.5, IAEA, Vienna (2009).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations Safety Standard Series SSR-1, IAEA, Vienna (2019)

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series No. SSG-9, IAEA, Vienna (2010) (under revision)

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, External Human Induced Events in Site Evaluation for Nuclear Power Plants, Safety Standard Series No. NS-G-3.1, IAEA, Vienna (2002).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series, No. SSG-18, IAEA, Vienna (2011).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.2, IAEA, Vienna (2002).

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-21, IAEA, Vienna (2012).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).

I-2.5. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO MISSION

Sub-Module 2.1: Application of Management System for Site Selection Process

- Management system manual;
- Organizational chart of the project with lines of responsibility;
- Main process used in site selection including data collection process.

Sub-Module 2.2: Review of the Site Survey and Site Selection Process

- Site Selection Report

I-3. MODULE 3: SITE EVALUATION REVIEW

I-3.1. INTRODUCTION

This module includes an independent review of the adherence to IAEA safety requirements and the level of detail in site investigation to establish the site's capacities to support the installation's design needs. It reviews the application of the management system, including the quality assurance programme, in site evaluation. This module is made up of three sub-modules as follows:

Sub-Module 3.1: Application of Management System for Site Evaluation

Sub-Module 3.2: Review of the Screening and Detailed Evaluation of External Hazards

Sub-Module 3.3: Review of the Site Evaluation Report

I-3.2. OBJECTIVE

This objective of this module is to review the site evaluation based on the relevant IAEA safety standards.

I-3.3. SCOPE

Sub-Module 3.1: Application of Management System for Site Evaluation

- Application of management system;
- Main processes used in site evaluation.

Sub-Module 3.2 Review Hazards Screening and Detailed Evaluation of External Hazards

- Hazards screening;
- Seismic hazards;
- Meteorological hazards;
- Hydrological hazards;
- Volcanic hazards;
- Geotechnical aspects and hazards;
- Hazards associated with external human induced events.

Sub-Module 3.3: Review of the Site Evaluation Report

- All non-screened out external hazards;
- Characteristics of the site and environment in terms of dispersion of radioactive materials in air, surface water and groundwater;
- Population density and distribution;
- Feasibility of planning effective emergency response actions.

I-3.4. APPLICABLE IAEA SAFETY STANDARDS

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Leadership and Management for Safety, Series No. GSR Part 2, IAEA, Vienna (2016).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear

Installations Safety Standard Series SSR-1, IAEA, Vienna (2019).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series No. SSG-9, IAEA (2010) (under revision)

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, External Human Induced Events in Site Evaluation for Nuclear Power Plants, Safety Standard Series No. NS-G-3.1, IAEA, Vienna (2002).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series, No. SSG-18, IAEA, Vienna (2011).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.2, IAEA, Vienna (2002).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-21, IAEA, Vienna (2012).

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).

I-3.5. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO MISSION

Sub-Module 3.1 Application of Management System for Site Evaluation

(Note: document titles may differ depending on the practice of the Member State)

- Management system manual;
- Organizational chart of the project with lines of responsibility;
- Main processes used in site evaluation.

Sub-Module 3.2 Review of the Screening and Detailed Evaluation of External Hazards

- Individual hazard analysis reports.

Sub-Module 3.3: Review of the Site Evaluation Report

- Site evaluation report.

I-4. MODULE 4: ENVIRONMENTAL IMPACT ASSESSMENT REVIEW

I-4.1. INTRODUCTION

The radiological environmental impact assessment starts with site selection and continues through the evaluation at the selected site of the environmental impacts of construction, operation and decommissioning. This module is made up of two sub-modules as follows:

Sub-Module 4.1: Application of the Management System for Radiological Environmental Impact Assessment

Sub-Module 4.2: Review of Radiological Environmental Impact Assessment Report

I-4.2. OBJECTIVE

This module provides a review of the radiological environmental impact assessment based on the relevant IAEA safety standards.

I-4.3. SCOPE

Sub-Module 4.1: Application of Management System for Radiological Environmental Impact Assessment

- Application of management system,
- Main processes used in radiological environmental impact assessment.

Sub-Module 4.2: Review of Radiological Environmental Impact Assessment Reports

- Radiological environmental impact assessment report.

I-4.3. APPLICABLE IAEA SAFETY STANDARDS AND NUCLEAR ENERGY SERIES

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations, IAEA Safety Standards Series SSR-1, IAEA, Vienna (2019).

[2] EUROPEAN COMMISSION, FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS, INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR ORGANIZATION, OECD NUCLEAR ENERGY AGENCY, PAN AMERICAN HEALTH ORGANIZATION, UNITED NATIONS ENVIRONMENT PROGRAMME, WORLD HEALTH ORGANIZATION, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3, IAEA, Vienna (2014).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series, No. SSG-18, IAEA, Vienna (2011).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for

Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.2, IAEA, Vienna (2002).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Establishing the Safety Infrastructure for a Nuclear Power Programme, IAEA Safety Standards Series No. SSG-16, IAEA, Vienna (2012). (under revision)

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Environmental and Source Monitoring for Purposes of Radiation Protection, IAEA Safety Standards Series No. RS-G-1.8, IAEA, Vienna (2005).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Regulatory Control of Radioactive Discharges to the Environment, IAEA Safety Standards Series No. WS-G-2.3, IAEA, Vienna (2000).

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, Licensing Process for Nuclear Installations, IAEA Safety Standards Series No. SSG-12, IAEA, Vienna (2010).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Prospective Radiological Environmental Impact Assessment for Facilities and Activities, IAEA Safety Standards Series No. GSG-10, IAEA, Vienna (2018).

OTHER SUPPORTING IAEA DOCUMENTATION

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes, IAEA Nuclear Energy Series No. NG-T-3.11, IAEA, Vienna (2014)

I-4.4. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO MISSION

Sub-Module 4.1: Application of the Management System for Radiological Environmental Impact Assessment

- Management system manual;
- Organizational chart of the project with lines of responsibility;
- Main process used in radiological environmental impact assessment

Sub-Module 4.2 – Review of Radiological Environmental Impact Assessment Report

- Radiological environmental impact assessment report

I-5. MODULE 5: SITE MONITORING REVIEW

I-5.1. INTRODUCTION

External hazards and site conditions need to be monitored over the lifetime of the nuclear installation. The monitoring programme is prepared and started before the start of construction and continued until decommissioning. This module is made up of two sub-modules as follows:

Sub-Module 5.1: Pre-Operational Stage Monitoring Programme Review

Sub-Module 5.2: Operational Stage Monitoring Programme Review

I-5.2. OBJECTIVE

This module provides a review of the site monitoring in conformity with the relevant IAEA safety standards.

I-5.3. SCOPE

Sub-Module 5.1: Pre-Operational Stage Monitoring Programme Review

- Site monitoring programme

A site visit needs to be planned to the investigation areas and to the monitoring facilities.

Sub-Module 5.2: Operational Stage Monitoring Programme Review

- Site monitoring programme

I-5.4. APPLICABLE IAEA SAFETY STANDARDS

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Evaluation for Nuclear Installations Safety Standard Series SSR-1, IAEA, Vienna (2019).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design, IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), IAEA, Vienna (2016).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Site Survey and Site Selection for Nuclear Installations, IAEA Safety Standards Series No. SSG-35, IAEA, Vienna (2015).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Hazards in Site Evaluation for Nuclear Installations, Safety Standard Series No. SSG-9, IAEA, Vienna (2010) (under revision)

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, External Human Induced Events in Site Evaluation for Nuclear Power Plants, Safety Standard Series No. NS-G-3.1, IAEA, Vienna (2002).

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Dispersion of Radioactive Material in Air and Water and Consideration of Population Distribution in Site Evaluation for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.2, IAEA, Vienna (2002).

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-18, IAEA, Vienna (2011).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Volcanic Hazards in Site Evaluation for Nuclear Installations, IAEA Safety Standards Series No. SSG-21, IAEA, Vienna (2012).

[9] INTERNATIONAL ATOMIC ENERGY AGENCY, Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).

[10] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Design and Qualification for Nuclear Power Plants NS-G-1.6, IAEA, Vienna (2003)

[11] INTERNATIONAL ATOMIC ENERGY AGENCY, External Events Excluding Earthquakes in the Design of Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.5, IAEA, Vienna (2003) (under revision)

I-5.5. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO MISSION

Sub-Module 5.1: Pre-Operational Stage Monitoring Programme Review

- Report on site monitoring programmes

Sub-Module 5.2: Operational Stage Monitoring Programme Review

- Report on site monitoring programmes.

I-6. MODULE 6: SAFETY REVIEW OF STRUCTURES, SYSTEMS AND COMPONENTS AGAINST EXTERNAL HAZARDS

I-6.1. INTRODUCTION

The module covers the safety of nuclear installations in relation to external hazards. It covers assessments of design, safety margins and probabilistic safety assessment against external events. It is to be implemented during the design and operation stages, and is made up of three sub-modules as follows: *Sub-Module 6.1: Review of Design of Nuclear Installations against External Hazards;*

Sub-Module 6.2: Review of Safety Evaluation of Nuclear Installations against External Hazards; and

Sub-Module 6.3: Review of External Event Probabilistic Safety Assessment.

I-6.2. OBJECTIVE

The objective of this module is to provide the Member States with an independent review of the design and safety evaluation of SSCs in relation to external hazards based on applicable IAEA safety standards.

I-6.3. SCOPE

Sub-Module 6.1: Review of Design of Nuclear Installations against External Hazards

- External event categorization for SSCs;
- Design and analysis of SSCs for external events;
- Qualification of SSCs against external events;
- Margins assessment against external hazards;
- Interaction between external hazards and potential combined effects.

Sub-Module 6.2: Review of Safety Evaluation of Nuclear Installations against External Hazards

- Margins assessment for beyond design basis external events;
- Selection of SSCs for the review;
- Identification of vulnerabilities and potential improvements;
- Interaction between external hazards and potential combined effects.

Sub-Module 6.3: Review of External Event Probabilistic Safety Assessment

- Review of the probabilistic hazard assessment;
- Systems analysis;
- Fragility analysis;
- Risk quantification.

I-6.4. APPLICABLE IAEA SAFETY STANDARDS

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design. IAEA Safety Standards Series No SSR-2/1 (Rev. 1), IAEA, Vienna (2016).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Seismic Design and Qualification for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.6, IAEA, Vienna (2003) (under revision)

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Geotechnical Aspects of Site Evaluation and Foundations for Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-3.6, IAEA, Vienna (2005).

[4] INTERNATIONAL ATOMIC ENERGY AGENCY, Evaluation of Seismic Safety for Existing Nuclear Installations, IAEA Safety Standards Series No. NS-G-2.13, IAEA, Vienna (2009).

[5] INTERNATIONAL ATOMIC ENERGY AGENCY, External Events Excluding Earthquakes in the Design of Nuclear Power Plants, IAEA Safety Standards Series No. NS-G-1.5, IAEA, Vienna (2003) (under revision)

[6] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Assessment for Facilities and Activities, Series No. GSR Part 4 (Rev.1), IAEA, Vienna (2016)

[7] INTERNATIONAL ATOMIC ENERGY AGENCY, Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, IAEA Safety Standards Series No. SSG-3, IAEA, Vienna (2010).

[8] INTERNATIONAL ATOMIC ENERGY AGENCY, Safety Classification Structures, Systems and Components in Nuclear Power Plants, IAEA Safety Standards Series No. SSG-30, IAEA, Vienna (2014).

Other IAEA documents

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Safety Classifications of Structures, Systems and Components in Nuclear Power Plants, IAEA-TECDOC-1787, IAEA, Vienna (2016).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Considerations on the Application of the IAEA Safety Requirements for the Design of Nuclear Power Plants, IAEA-TECDOC-1791, IAEA, Vienna (2016).

[3] INTERNATIONAL ATOMIC ENERGY AGENCY, Assessment of Vulnerability of Operating Nuclear Power Plants to Extreme External Events, IAEA-TECDOC-1834, IAEA, Vienna (2017).

I-6.5. INPUTS TO BE RECEIVED FROM COUNTERPART PRIOR TO MISSION

Sub-module 6.1: Review of Design of Nuclear Installations against External Hazards

- PSAR/SAR (Preliminary Safety Analysis Report)

Sub-Module 6.2: Review of Evaluation of Existing Installations against External Hazards

- Safety Evaluation report against external hazards

Sub-Module 6.3: Review of External Event Probabilistic Safety Assessment

- Report on External Event Probabilistic Safety Assessment (with chapters on systems, fragilities and quantification)

ANNEX II: SAMPLE OF TERMS OF REFERENCE FOR A SEED MISSION

Terms of Reference for the IAEA SEED Review Mission on
"Title of the Mission", Date
Project number

II-1. BACKGROUND

II-2. OBJECTIVES AND SCOPE

II-3. DURATION AND SCHEDULE OF THE PHASE 1 REVIEW

- Duration xx days
- Schedule: x-x month, 20xx

II-4. VENUE

II-5. Safety Review Team (SRT)

- The SRT members' names.

II-6. PREPARATION PRIOR TO THE MISSION

- The contact point in (Country XX) is requested to make the necessary preparations for the conduct of the mission making available any personnel that was involved in the development of the data being reviewed by the review mission, making available the required space for meetings (working rooms, presentation equipment,), invitation of participants and general logistics.
- The contact point in (Country XX) is requested to send, in advance of the mission, a list of participants who will make presentation providing relevant information that might be useful for the development of recommendations in the mission report.
- The contact point in (Country XX) is requested provide to the SRT access to relevant information subjected to the review (as per mission objectives and scope).
- In order to achieve the SEED service within the duration of the meeting, all necessary documents of the counterpart need to be provided to the IAEA team in advance before the meeting.

II-7. REFERENCE FOR REVIEW

The following documents will be used as reference during the mission:

- All applicable IAEA Safety Standards

II-8. CONDUCT OF THE MISSION

Provisional Agenda

A typical programme/agenda of a SEED review mission is provided in Annex IV.

Details on the conduct of the review

Review methodology

II-9. OUTCOME OF THE MISSION

The outcome of the SEED review mission is a mission report. The principal conclusions and recommendations resulting from the review are shared with the national regulatory body.

ANNEX III: PREPARATORY MEETING FOR A SEED MISSION

The preparatory meeting includes the following:

Agreement with the Counterpart:

- Confirm the objective, scope, date, place, agenda, reference contacts of the mission;
- Clarify conduct of the review: documents, meetings with the counterpart and/or other organizations, walk-down, site visits;
- Clarify the basis for the review: select the reference IAEA Safety Standards, review issues, etc.; and
- Agree on the composition of the review team, i.e., the expertise required, numbers of participants.

Presentation by the counterpart organization to the SRT:

This part of the meeting gives the counterpart the opportunity to explain their expectation and to provide information about the status of its activities relevant for the mission.

Presentation by the SRT to the counterpart staff on the SEED Review process:

This part of the meeting allows the team to:

- Explain the SEED Review process covering: the overall process; roles and responsibilities of all the participants; schedule; entrance meeting; document review, interviews and direct observation; development of observations, conclusions, recommendations, suggestions and good practices; drafting of the Mission Report; and the exit meeting.
- Explain (and provide) IAEA Safety Standards used as the basis of the SEED; and
- Explain that it is important for the success of the Mission that the counterpart provides comprehensive written material and replies in English.

Discussion of the practical and logistical aspects of the Mission between the SRT and the counterpart.

These discussions cover the:

- Mission schedule including logistics for the members of the review team to visit other locations, e.g., nuclear installation's sites;
- Working areas within the counterpart offices, clerical/secretarial support in English, with at least one room at the disposal of the team;
- Forms to be filled out in advance for visas, security badges, and detailed contact information;
- Need for interpretation and translation of documents; and
- Safety equipment (safety shoes, safety glasses, etc.).

ANNEX IV: TYPICAL PROGRAMME/AGENDA OF A SEED MISSION

Date: date
Place: Place (Country)
Counterpart: Name

Day 1

Morning Session

Opening remarks by the counterpart and IAEA: objectives and scope of the mission, and adoption of agenda;
Presentations of the counterpart
Presentations on the technical topics of the review mission by representatives from the counterpart

Afternoon Session

Discussions on the technical topics of the review mission

Day 2

Walk-down or visit at the xx site and/nuclear installation (if applicable)

Day 3

Working session of the IAEA team for the document's evaluation

Day 4

Working session of the IAEA team on the findings and report preparation

Day 5

Working meeting with the technical representatives of the counterpart, contractors and consultant representatives. Presentation of the IAEA recommendations and suggestions lists

Final Session:

Briefing meeting with management level of the counterpart

ANNEX V: IAEA CHECKLIST FOR SEED MISSION

	Task	Responsibility
Request from a Counterpart		
1.	Receive request from a CP through the IAEA official channels for conducting a SEED	CP and IAEA
2.	Appoint SRT leader	IAEA
3.	Appoint the contact person	CP
5.	Define the objectives and scope of the SEED	IAEA SRTL and CP
Preparatory phase		
6.	Preparatory meeting	IAEA SRTL and CP
7.	Agree on the objectives and define the exact scope, date, place, agenda and the terms of reference	IAEA SRTL and CP
8.	Clarify conduct of the review: documents, meetings with CP and/or other organizations, walk-down, site visits – Finalize the agenda	IAEA SRTL and CP
9.	Clarify the basis for the review: select the reference IAEA Safety Standards, review issues, etc.	IAEA SRTL and CP
10.	Clarify the details of logistics: accommodation, meeting place, site visits (access permission), organization of connected official events, meals, etc.	IAEA SRTL and CP
11.	Clarify the need for logistic support (transportation from/to airport to hotel, from/to hotel to place of the meeting, secretaries, meeting appliances (projectors, copier, internet access, telephone line, etc.), anticipated deliveries of lecturer notes, interpretation services, etc.	IAEA SRTL and CP
12.	Request a SEED self-assessment (if applicable)	IAEA SRTL and CP
13.	Recruit SRT members and start the internal clearance process	IAEA SRTL
14.	Provide background information to SRT members	IAEA SRTL
15.	Review and distribute advance reference documents	IAEA SRTL and team Members
	Obtain the SRT members' comments on the preparatory material and send them back to the CP	IAEA SRTL and CP
16.	Possible briefing session with the SRT members	IAEA SRTL and SRT members
17.	Prepare site visit coordination/schedule	IAEA SRTL, CP and SRT members
18.	Compilation of the contributions from the SRT members to the mission report	IAEA SRTL and SRT members
19.	Finalization of the mission report	IAEA SRTL and SRT members

Note: CP = Counterpart; SRTL = SRT Leader, SRT=Safety Review Team

ANNEX VI: RESPONSIBILITIES OF REVIEW MISSION PARTICIPANTS

VI-6.1. Responsibilities of Mission Participants during the Preparatory Phase

The mission participants include the SRT leader, the SRT members, and the counterpart contact person with other counterpart members. In case a media contact is needed, public communication staff of IAEA will also participate. The leader of the SRT is an IAEA staff member and selected by the EESS Section Head.

The SRT leader is responsible for:

- Serving as SEED liaison, in conjunction with the involved IAEA staff, to the counterpart and external stakeholders, prior to, during, and after the review mission;
- Interacting with the appropriate section/divisions of the IAEA;
- Coordinating external interactions related to the conduct of SEED review mission;
- Preparing a briefing for the counterpart on the SEED process, including providing a copy of these guidelines;
- Identifying appropriate SRT members and assigning tasks and responsibilities;
- Determining the scope of the mission and all aspects of the Terms of Reference;
- Obtaining the advance reference documents from the counterpart according to the agreed schedule, reviewing them, and distributing them to the SRT;
- Communicating with SRT members on a regular basis prior to and during the review mission, to ensure SRT members are adequately prepared and informed, including providing information about the preparatory meeting with the counterpart and the advance reference documents;
- Confirming and finalizing all resourcing arrangements for the mission, particularly the source of funding;
- Confirming that appropriate travel arrangements have been made by the team, ensuring that all SRT members are scheduled to arrive in the host country in sufficient time to attend the initial team meeting;
- Ensuring necessary security training and clearance for the SRT, if needed.

Once the objectives and scope of the mission are defined, the SRT leader identifies the required expertise of SRT members and selects, contacts, and recruits the required discipline professionals for the review mission in accordance with IAEA procedures and established agreements. In selecting individuals, the SRT leader considers the following:

- SRT members need to be recognized in their field of involvement, with experience in both national regulations and IAEA safety standards;
- SRT members cannot have potential conflicts of interest;
- Collectively the SRT needs to cover all technical aspects included in the scope of the mission.

When the SRT members are selected, the SRT leader will:

- Inform the SRT members of their duties in all phases of the review;
- Emphasize the importance of the SRT members recognizing the collective responsibility they have as part of the team and clearly state the expectations;
- Assign specific tasks and responsibilities to SRT members at the earliest opportunity so they may concentrate on their specific responsibilities, using the SEED review mission scope and provisional schedule; and

- Obtain agreement and commitment from the SRT members to fulfil their responsibilities.

For reduced-scope or follow-up SEED missions, not all previous SRT members positions need to be filled. In these instances, the SRT leader assigns the roles and responsibilities of vacant positions to other SRT members.

The list of SRT members is approved by the counterpart that has requested the review mission.

SRT members

The SRT is a multi-disciplinary team of individuals with expertise in all the engineering and scientific disciplines required for the review. The SRT is expected to be familiar with the IAEA safety standards relevant to the review mission and the SEED guidelines. The SRT is intended to remain intact until the review programme is completed, to provide continuity and efficiency for subsequent missions.

SRT members are responsible for:

- Making necessary preparations for the SEED review, on the basis of information from the SRT leader;
- Being familiar with IAEA safety standards that are to be the basis for the review, as well as the guidelines of the mission (i.e. this publication), and the mission specific documents (e.g. Terms of Reference).
- Thorough review of the advance reference documents for conformity with the relevant IAEA safety standards and preparation of comments and recommendations based on the advance reference documents;
- When appropriate, establishing a short list of questions for the counterpart designed to facilitate the discussion by allowing the counterpart to prepare answers in advance;
- Providing written comments and recommendations to the SRT leader on major issues identified related to the assigned area for review according to the agreed schedule;
- Preparing a short summary/presentation of his/her reviews of the advance reference documents and initial observations, to be presented at the initial team meeting (if necessary).

Each SRT member will:

- Obtain a visa, if required;
- Undergo security training courses of the United Nations, as instructed by the SRT leader;
- Register in the IAEA recruiting system as necessary;
- Arrange to receive the required immunizations and medical clearance;
- Make travel arrangements and provide information to the counterpart and SRT leader regarding travel details. This may also involve coordination with the TC-PMO (if applicable).

Counterpart Organization

The counterpart organization nominates an individual to serve as the contact person in relation to IAEA. This individual needs to be knowledgeable on all matters relating to the SEED review mission and have a good understanding of what the counterpart has provided with respect to

the modules being reviewed as well as a good overview of the organization. The counterpart contact person is expected to be able to access the necessary resources and have credibility with the staff of the counterpart organization. The counterpart contact person needs to be the same individual during all the stages of the review process.

For each safety topic to be covered, knowledgeable specialists within the counterpart need to be nominated sufficiently in advance, so they have the necessary time to prepare for the review. Technical participants within the counterpart are expected to have participated in the work being reviewed and, to the extent possible, and have overlapping expertise to assure complete and in-depth coverage of the scope of safety issues to be addressed. Members of a TSO who took active part in the tasks to be reviewed need to be invited, to improve effectiveness of the review.

The counterpart contact person is responsible for:

- Liaison with the SRT leader on all matters pertaining to the preparation for and conduct of the mission;
- Ensuring a working environment for the team that is free of undue influence by external parties;
- Providing timely access to information and resources necessary for efficient conduct of the mission;
- Organizing their preparatory work;
- Providing the requested reference material according to the agreed programme;
- Providing the necessary documents to the SRT on time;
- Arranging logistics of the mission as described in the Terms of Reference;
- Organizing site visits and walkdowns of the installation as necessary;
- Making the necessary arrangements for entry to the facilities;
- Arranging local transportation;
- Arranging for adequate working space for the team including printers, paper and audio-visual equipment (as necessary). Adequate working space needs to be considered with the need for privacy of the SRT to conduct confidential discussions;
- Making arrangements for communication between SRT members in the country;
- Making arrangements for translators and technical escorts, if required.

VI-6.2. Responsibilities of mission participants during the conduct of the mission

SRT Leader

The SRT leader is responsible for:

- Leading the SEED review mission;
- Ensuring that the objectives of the mission are achieved;
- Preparation of the preliminary mission report based on input and recommendations from the SRT members.

SRT members

SRT members are responsible for:

- Conducting the SEED review mission as directed by the SRT leader;
- Reviewing the assigned technical area based on the IAEA safety standards;

- Preparing comments and recommendations for their area of review;
- Jointly contribute to consolidation of the team observations, conclusions, recommendations, suggestions and good practices;
- Contribute to the preliminary and final SEED mission report;
- Maintaining appropriate confidentiality of sensitive information in accordance with their confidentiality agreement.

ANNEX VII: SAMPLE OF A SEED MISSION REPORT

REPORT

EXTERNAL EVENTS SAFETY SECTION
SITE AND EXTERNAL EVENTS DESIGN (SEED) REVIEW MISSION

Example: Review of the Site Evaluation Report

City, Country
Date xx-xx-xxxx

EXTERNAL EVENTS SAFETY SECTION
SITE AND EXTERNAL EVENTS DESIGN (SEED)
REVIEW MISSION

Example: Site Survey and Selection

Mission date: xx-xx-xxxx

Location: City, Country

Facility: Counterpart Office

Organized by: IAEA
Technical Cooperation Project JOR/2/007-07-01

Safety Review Team: Name IAEA/NSNI/EESS, Team Leader
Name of team member Country
Name of team member Country
Name of team member Country

"Findings, conclusions and recommendations resulting from the IAEA Programme are intended only to assist national decision makers who have the sole responsibility for the regulation and the safe operation of their nuclear power plants. Moreover, they do not replace a comprehensive safety assessment which needs to be performed in the framework of the national licensing process".

IAEA-xxxx
Issue date: xx-xx-xxxx
Rev.: 00

CONTENTS

ISSUE SHEET (sample)

1. Issue Identification		Issue Number:	01
		Revision Number:	00
		Date:	DD/MM/YYYY
Installation:			
Unit:			
Review Area:	Siting for Nuclear Power Plants		
Issue Title:	Geology and Seismology		

2. Issue clarification

2.1 Issue Description

Background:

Safety relevance:

2.2 Reference documents

IAEA Safety Standards and documents:

i.

Documents reviewed:

ii.

3. Counterpart's views and measures (self-assessment by the counterpart)

3.1

4. Assessment by the Safety Review Team	**Date:**	**DD/MM/YYYY**

4.1 Comments:

C1

4.2 Recommendations:

R1

5. Status of the issues (for follow-up missions only)			**Date:** DD/MM/YY	**Date:** DD/MM/YY
5.1 Resolution Degree (RD):				
1	**No action**	The issue was not identified by the counterpart, or having been identified, no action was taken to resolve it.		
		No progress in the resolution of the issue, or unsatisfactory resolution.		
2	**Action under way**	The issue was identified by the counterpart, but the actions did not conform to IAEA Safety Standards.		
		The issue was identified by the counterpart and work has started to resolve it.		
3	**Issue partially resolved**	The issue was identified by the counterpart and actions are underway, but no final results are available yet.		
		The implemented actions meet partially the intent of recommendations of previous IAEA review.		
4	**Issue resolved**	The issue was identified by the counterpart and the solution provided is fully satisfactory. Issue closed.		
		The intent of recommendations of previous IAEA review is fully met. Issue closed.		
5.2 Urgency Degree (UD): *(for operating plants)*				
I	*The issue should be addressed urgently, before: (indicate a key date)*			
II	*The issue should be addressed before: (indicate a key date)*			

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Consultancy Meetings

1st Consultancy Meeting: Vienna, Austria: 24 – 25 November 2014

2nd Consultancy Meeting: Vienna, Austria: 19 – 21 August 2015

3rd Consultancy Meeting: Vienna, Austria: 28 – 30 November 2016

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