IAEA
International Atomic Energy Agency

Occupational Radiation Protection Appraisal Service (ORPAS) Guidelines

Vienna, September 2020

IAEA Services Series 43

IAEA SAFETY STANDARDS AND RELATED PUBLICATIONS

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OCCUPATIONAL RADIATION PROTECTION APPRAISAL SERVICE (ORPAS) GUIDELINES

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IAEA SERVICES SERIES No. 43

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INTERNATIONAL ATOMIC ENERGY AGENCY
VIENNA, 2020

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OCCUPATIONAL RADIATION PROTECTION APPRAISAL SERVICE (ORPAS) GUIDELINES
IAEA, VIENNA, 2020
IAEA-SVS-43
ISSN 1816–9309

Printed by the IAEA in Austria
September 2020

FOREWORD

The IAEA's Occupational Radiation Protection Appraisal Service (ORPAS) was established in 2001 to advise Member States, upon request, on ways to strengthen and enhance their legislative and regulatory infrastructure for occupational radiation protection; technical services relating to protection and safety, such as services for personal dosimetry and the calibration of monitoring and measuring equipment; and practical implementation of their arrangements for occupational radiation protection. The key objective of an ORPAS mission is to determine whether the host country has made adequate arrangements for occupational radiation protection and whether those arrangements are functioning to the extent that the practical provisions for occupational radiation protection are effective and generally optimized.

The core component of the ORPAS process is review against the safety requirements established in IAEA Safety Standards Series No. GSR Part 3, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards. During an ORPAS mission, recommendations and suggestions may be offered to the host country. Recommendations made are related to items of direct relevance to safety as referenced in IAEA safety requirements; suggestions made relate to items that, while not essential to ensure compatibility with IAEA safety requirements, may enhance the effectiveness of the national arrangements on occupational radiation protection against the guidance presented in IAEA Safety Guides. Good practices identified may also be documented for consideration by other States.

This publication presents the ORPAS Guidelines as revised based on the lessons learned from past missions and on contributions and comments provided by Member States in review meetings and workshops. The review and revisions were finalized at a consultancy meeting held in Vienna in August 2015 and an ORPAS Future Directions Workshop organized in February 2019.

The IAEA would like to express its appreciation to all the experts who contributed to the development and review of these guidelines. The IAEA officer responsible for this publication was H.B. Okyar of the Division of Radiation, Transport and Waste Safety.

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1. INTRODUCTION

The International Atomic Energy Agency (IAEA) is authorized by its Statute to establish international standards for the safety and protection of health, the environment and property against harmful effects of ionizing radiation. This has led to the publication, inter alia, of Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (GSR Part 3) [1]. The IAEA has also a statutory responsibility to provide for the application of safety standards in Member States and the IAEA carries out appraisal reviews to check whether the application of the standards is appropriate. These guidelines are intended to assist in the appraisal of one major area of application of GSR Part 3, namely occupational radiation protection.

To assist Member States in the application of requirements for occupational radiation protection, the IAEA has published a General Safety Guide on Occupational Radiation Protection (GSG-7), which is jointly sponsored by the IAEA and the International Labour Office (ILO) [2].

The Safety Requirements GSR Part 3 and the Safety Guide GSG-7 are the two main publications against which the appraisal described in these guidelines is conducted. The IAEA has also established additional safety requirements, such as Governmental, Legal and Regulatory Framework for Safety, GSR Part 1 (Rev.1), Leadership and Management for Safety, GSR Part 2 and Safety Assessment for Facilities and Activities, GSR Part 4 [3-5], which are also used in ORPAS reviews in order to cover all facilities and activities where occupational radiation protection is applied.

An appraisal of occupational radiation protection arrangements following their development and implementation, and periodically thereafter, is an effective way to ensure that those arrangements are optimized and effective. The ORPAS methodology has similarities with the other IAEA review missions and advisory services, and these ORPAS guidelines follow the same structure of the other IAEA Services Series, such as the Integrated Regulatory Review Service Guidelines [6].

The ORPAS was developed to support the application of the IAEA Safety Fundamentals, Safety Requirements and Safety Guides and to enhance the effectiveness of national arrangements on occupational radiation protection. The Member State conducts a self-assessment, as part of the preparation for an ORPAS mission, and then receives an IAEA-coordinated peer review conducted by a team of international reviewers. ORPAS missions provide an opportunity for the host country and peer review team members to share experiences regarding all aspects of occupational radiation protection in the host country. The review is structured to lead to the identification of areas for improvement and the formulation by the host country of an action plan to address identified deficiencies. Site visits conducted during ORPAS missions are an essential review mechanism to gather information that enables an evaluation to be carried out of each appraisal topic. Site visits can be conducted at the premises of the regulatory body and of technical service providers and at operational facilities.

An ORPAS follow-up mission is usually undertaken, within 5 years, through which the host country and the ORPAS team assess progress in implementing the recommendations and suggestions in the period since the initial review. The ORPAS follow-up mission also provides an opportunity for the IAEA, international reviewers and host country to identify additional technical issues for review and to identify further good practices.

These ORPAS Guidelines provide:

— Guidance to host countries, peer reviewers and IAEA Coordinators on the preparation, conduct and reporting of ORPAS missions and follow-up missions;
— A consistent and systematic methodology for reviewing whether:
  - The necessary legislative and regulatory infrastructure for occupational radiation protection is in place and functioning;

- Operators[1] (employers, registrants and licensees) are aware of their responsibilities and have effective radiation protection programmes in place and functioning, with the aim of ensuring optimized radiation protection for workers;
- Technical service providers, such as technical support organizations, are available and able to provide radiation protection services, in compliance with GSR Part 3 [1] and GSG-7 [2], for the assessment of occupational exposure from external sources of radiation, assessment of occupational exposure due to intakes of radionuclides, workplace monitoring, recording of occupational exposure and advisory services;
- All involved organizations have management systems in place and functioning to ensure ongoing adherence to safety standards;
- Safety culture at facilities and activities is promoted.

The expected outcomes of an ORPAS mission are:

— To identify areas for improvements of the occupational radiation protection arrangements to meet the IAEA Safety Standards;
— To make recommendations and suggestions related to the identified areas for improvement;
— To provide assistance, if necessary, for the development of an action plan to achieve improvements.

This publication will be made available to the host country upon request of an ORPAS mission, so that appropriate preparations can be made in advance of the review mission.

2. BACKGROUND TO ORPAS

ORPAS missions provide an independent appraisal of radiation protection arrangements for workers and provide a cross-cutting review against the relevant IAEA Safety Standards, of the regulatory framework for occupational radiation protection and the application of the requirements at all technical service providers, facilities and activities utilizing radiation technologies in the host Member State.

2.1. THE APPRAISAL SERVICE CONCEPT

While each Member State is responsible for its own arrangements for occupational radiation protection, a request for an ORPAS mission can be sent to the IAEA to provide an appraisal of some or all aspects of the requesting country's arrangements for occupational radiation protection. Such an appraisal provides an opportunity for a Member State to have its occupational radiation protection arrangements independently assessed and evaluated in an objective and unbiased manner by international experts selected for:

— Their experience in such appraisals;
— Their knowledge of international guidance and best practices;
— Their ability to recognize and understand the strengths of different national systems and arrangements.

ORPAS is essentially based on international guidelines and best practices. It is neither prescriptive nor rigid, since it takes into account the practical context in the host country and emphasizes the positive features of 'how things are actually being done' in that country. ORPAS can be tailored to country-specific circumstances and needs. Consequently, the procedures described in this publication are to be regarded and used as guidelines.

The purpose of ORPAS is to check the regulatory and practical implementation of occupational radiation protection arrangements in the host country and focus not only on the regulatory body, but

[1] Any person or organization applying for authorization or authorized and/or responsible for safety when undertaking activities or in relation to any nuclear facilities or sources of ionizing radiation. The term 'end-user' is used in the same broad sense as 'operator' in these Guidelines and in the ORPAS questionnaires.

also on operators and technical service providers. In other words, the appraisal tries to answer the question: 'are the arrangements adequate (in a regulatory sense) and do they work (in a practical sense)?', given the national context in which they are applied. The appraisal provides a basis for identifying areas where improvements may be needed and for determining the most appropriate recommendations and suggestions for achieving such improvements.

2.2. OPRAS IN THE CONTEXT OF OTHER IAEA REVIEW SERVICES

The IAEA offers several safety and security review, advisory, evaluation and appraisal services to Member States[2]. All IAEA reviews provide an opportunity to exchange professional experience and to share lessons learned and good practices. They constitute a mutual learning mechanism that accommodates approaches to national regulatory body and practices that may differ but that share the common objective of ensuring effective occupational radiation protection arrangements at the national level. Missions are conducted in an environment of close cooperation and communication with the Member State, with a view to enhancing the ownership of the recommendations and suggestions by the Member State. These reviews may also provide an opportunity for identifying insights, if any, for future strengthening of the IAEA Safety Standards and for the establishment of a knowledge base in the context of occupational radiation protection.

The currently available, broadly based IAEA review missions and advisory services that focus on elements of occupational radiation protection, are the following:

— Integrated Regulatory Review Service (IRRS) [6];
— Emergency Preparedness Review Service (EPREV) [7];
— Operational Safety Review Team (OSART) [8];
— Integrated Safety Assessment of Research Reactors (INSARR) [9];
— Integrated Mission of Programme of Action for Cancer Therapy (ImPACT);
— Quality Improvement Quality Assurance Team for Radiation Oncology (QUATRO) [10];
— Quality Management Audits in Nuclear Medicine Practices (QUANUM) [11];
— Quality Improvement Quality Assurance Audit for Diagnostic Radiology Improvement and Learning (QUAADRIL) [12];
— Integrated Nuclear Infrastructure Review (INIR) [13];
— Education and Training Appraisal (EduTA).

Additionally, the tool for self-assessment of regulatory infrastructure for safety (SARIS) [14] includes a module for operators and technical service providers based on GSR Part 3.

The provision of services by the IAEA's Department of Nuclear Safety and Security is always being reviewed and improved. Moreover, other IAEA departments also provide services in relation to their scope of activities and these services might include a component linked to occupational radiation protection arrangements. There is inevitably some overlap of the above services, and between these and other specialized services that support and complement them. This publication describes the guidelines for ORPAS missions without further reference to this overlap.

3. OBJECTIVES OF ORPAS

The team of reviewers participating in an ORPAS mission has direct experience applicable to all aspects of the agreed scope of the review.

The general objectives of an ORPAS mission are to enhance national occupational radiation protection arrangements' effectiveness by:

[2] IAEA review missions and advisory services for Member States are listed here: https://www.iaea.org/services/review-missions

— Providing an opportunity for continuous improvement of the occupational radiation protection programme arrangements through an integrated process of self-assessment and review;
— Determining whether the host country has made adequate arrangements for occupational radiation protection and whether these arrangements are functioning to the extent that the practical provisions for occupational radiation protection are effective and generally optimized;
— Providing the host country (regulatory body, technical service providers and operators) with an objective evaluation of its occupational radiation protection arrangements with respect to the IAEA Safety Standards;
— Providing key staff in the host country with an opportunity to discuss with ORPAS Reviewers who have experience of other regulatory practices in the same field regulatory practices on occupational radiation protection, occupational exposure monitoring practices, arrangements under the radiation protection programme and operational experience;
— Providing the host country with recommendations and suggestions for improvement;
— Promoting the sharing of experience and the exchange of lessons learned among experts involved in the ORPAS missions;
— Providing other States with information regarding good practices identified in the course of the review;
— Providing ORPAS Reviewers from Member States and IAEA staff with opportunities to observe different approaches to control, monitor and record occupational exposure and to broaden their own experience (mutual learning process);
— Contributing to the harmonization of approaches on control, monitoring and recording of occupational exposure among States;
— Promoting self-assessment, safety culture and management systems at facilities and activities;
— Promoting the application of the IAEA Safety Standards;
— Providing feedback on the use and application of the IAEA Safety Standards; all ORPAS participants are encouraged to discuss issues arising related to the standards and potential improvements of the IAEA safety standards.

To achieve these objectives, ORPAS has to determine whether:

(a) The necessary legislative and regulatory occupational radiation protection infrastructure is in place and functioning;
(b) Operators are aware of their responsibilities and have effective radiation protection programmes in place and functioning, with the aim of ensuring optimized radiation protection of workers;
(c) Technical service providers are available and able to provide radiation protection services, in compliance with GSR Part 3, in respect of:
— Assessment of occupational exposure from external sources of radiation;
— Assessment of occupational exposure due to intakes of radionuclides;
— Workplace monitoring;
— Calibration services;
— Recording of occupational exposure;
— Advisory services.
(d) All involved organizations have management systems in place and functioning;
(e) Safety assessment, leadership and safety culture at facilities and activities are promoted.

4. SCOPE OF ORPAS

The scope of ORPAS includes the review of the legislative and regulatory infrastructure for occupational radiation protection, technical services relating to protection and safety, such as services for personal dosimetry and the calibration of monitoring and measuring equipment, and practical implementation of Member States' arrangements for occupational radiation protection through radiation protection programmes by operators.

The scope of an ORPAS mission is agreed between the host country and the IAEA through the identification of possible National Counterparts and it is finalized during the preparatory meeting. The ORPAS follow-up missions focus on reviewing the progress in implementing the recommendations and suggestions that were open and not closed during previous ORPAS missions.

5. STRUCTURE OF ORPAS

5.1. STRUCTURE

ORPAS has a modular structure designed to be tailored to the three sets of national counterparts that may be involved in an ORPAS mission: the regulatory body, the operators (licensees or registrants) and the technical service providers.

ORPAS is based on a set of questionnaires[3] covering the different aspects of occupational radiation protection arrangements that need to be evaluated. The ORPAS questionnaires are addressed to each national counterpart and are completed by the national counterparts as part of the self-assessment which takes place during the preparatory phase of the mission. The use of the questionnaires is intended:

— To provide an effective and efficient information collection technique;
— To provide a complete information database upon which to base recommendations;
— To assist in achieving consistency across different missions;
— To provide a standard recording format for incorporation into the country profile.

The questionnaires address the technical and organizational aspects of occupational radiation protection for both normal operation and emergencies and were developed based on GSR Part 3 [1] and the supporting Safety Guides on occupational radiation protection [2, 15-17]. Reference to these publications is strongly advised during the completion of the questionnaires.

The basic structure of the questionnaires has been chosen to enable them to be used before the mission by the host country as well as by the review team. To facilitate efficient completion, most questions are intended for 'Yes/No' responses, but always with a follow-up for further (brief) explanations where appropriate. In general, this means that no justification is needed for responses that meet the accepted standards although evidence needs to be provided to justify the response.

The questionnaires have been incorporated in a computer software programme called 'self-assessment of regulatory infrastructure for safety' (SARIS) [14], which automates and streamlines the use of the questionnaires and the production of reports. The national counterparts can select how to conduct the self-assessment, either by completing the ORPAS questionnaires or by using the SARIS ORPAS module.

Table 1 illustrates the host country counterparts and the corresponding questionnaires that are used in the self-assessment process.

5.2. REGULATORY BODY

The regulatory body is responsible for establishing and enforcing requirements to ensure that protection and safety of workers is optimized, for ensuring that applicable dose limits are complied with, and for monitoring and recording occupational exposure.

[3] The questionnaires are available on the ORPAS platform: https://gnssn.iaea.org/main/ORPAS/questionnaires/SitePages/Home.aspx

5.3. OPERATORS

Operators are responsible for establishing and maintaining an occupational radiation protection programme, including organizational, procedural and technical arrangements for the designation of controlled areas and supervised areas, for local rules and for monitoring of the workplace.

In this publication, a single set of ORPAS questionnaires has been developed for the appraisal of operators to reflect the wide range of different activities that can be encountered. The remit of an ORPAS mission can include a selection of these activities based on the national needs.

TABLE 1. ORPAS NATIONAL COUNTERPARTS AND APPLICABLE QUESTIONNAIRES

	Occupational Radiation Protection Framework
Regulatory body	Legal and regulatory framework on occupational exposure (including control, monitor and recording requirements)
	Requirements for radiation protection programmes
	General responsibilities of registrants, licensees and employers
	General responsibilities of workers
	Authorization/approval and monitoring provisions for technical service providers
Operators (Employers, Registrants, Licensees)	Authorization details for any activity
	Control of radioactive material
	Control of radioactive sealed sources
	Co-operation between employers, licensees and registrants
	Health surveillance
	Individual monitoring programme
	Arrangements for the emergency workers during emergencies
	Organizational structure
	Management systems
	Radiation protection measures
	Radiation protection programme
	Staff selection, information and training
	Workplace monitoring programme
Technical Service Providers for External Dosimetry	General provisions for the authorization / approval of external dosimetry services
	External dosimetry services provided
	Dosimetric specifications
	Dosimeter type testing
	Dosimeter performance testing
	External dosimetry- management systems
Technical Service Providers for Internal Dosimetry	General provisions authorization / approval of internal dosimetry services
	Internal dosimetry assessment methods provided
	Direct measurement methods
	Biokinetic models for internal dosimetry and interpretation of measurements
	Indirect measurement methods
	Dosimetric quantities and calibration procedures
	Internal dosimetry- management systems
Technical Service Providers for Dose Record Keeping Service	Record keeping service approval
	Basic details of dose record keeping service
	Management system for dose recording
	General provisions for the approval of workplace monitoring services
	General provisions for workplace monitoring (radiation

Technical Service Providers for Workplace Monitoring	contamination) programme
	Workplace monitoring (radiation contamination) services provided
	Testing and use of radiation measurement equipment
	Workplace monitoring (radiation contamination) management system specific provisions
	General provisions- management systems
General Technical Services	General provisions for the provision of technical services
	Management system - technical services

5.3.1 Medical applications

Image guided interventional procedures are developing fast and their application can result in high doses. Diagnostic radiology is encountered in all States, usually with a large number of individual installations around the country; occupational radiation protection arrangements are based on good procedures supplemented by external dosimetry. In nuclear medicine, the hazard is mainly from exposure to radiopharmaceuticals in preparation, dispensing and application to the patient, nursing and waste management. In nuclear medicine, the focus is on good procedures and housekeeping, often supplemented by internal monitoring, but recognizing that monitoring is more complex and less sensitive. For therapeutic uses of nuclear medicine, the problems are similar but the activities much higher, so the control has to be more rigorous. High dose rate brachytherapy is a special technique that, if after-loading is not practised, can give high doses to medical staff. In external beam therapy the doses to staff are generally minimal, provided that effective measures are in place to exclude staff's presence in patient areas during treatment. Finally, there are surgical and investigative techniques that give potentially very high doses to medical staff and which might demand elaborate controls and specialized dosimetry. Additional details on Radiation Protection and Safety in Medical Uses of Ionizing Radiation are included in the IAEA Safety Standards Series No. SSG-46, Radiation Protection and Safety in Medical Uses of Ionizing Radiation [15].

5.3.2 Industrial applications

Sealed sources are used in many industrial applications, such as gauging, and doses to workers are normally very low; this would usually be confirmed by external monitoring. Industrial radiography is a special case, especially site radiography, as persons often work unsupervised, sometimes with minimal training, and accidental exposures and overexposures are more common. Emphasis needs to be placed on improved training, more rigid procedural controls, equipment maintenance and effective contingency and emergency plans. In some applications, such as well logging and moisture gauges, neutron sources are used which need special monitoring. Some industrial operations involve handling of large quantities of gaseous or volatile compounds, such as tritium used in aluminizing, for which internal dosimetry is needed. Industrial irradiators use high activity sources or high output machines so that protection focuses on keeping the operators from being exposed, i.e. on accident prevention. Additional details are included in IAEA Safety Standards Series No. SSG-8, Radiation Safety of Gamma, Electron and X Ray Irradiation Facilities [16] and No. SSG-11, Radiation Safety in Industrial Radiography [17].

5.3.3 Research and education

It is difficult to identify general aspects for these activities, because research can cover many applications of sealed or unsealed sources and radiation generators. Occupational radiation protection arrangements in research and education need a wide range of knowledge and heightened awareness and ability to react rapidly to changing situations. In education, radiation sources generally are of low activity or energy since they tend to be used for demonstration. However, researchers and students using them are, by definition, undergoing training so special attention is needed to instil the radiation protection measures.

5.3.4 Natural sources of radiation

Exposure to natural sources occurs in every workplace but in the vast majority it is not appropriate to monitor or control. The main exception is exposure to radon in workplaces outside the nuclear fuel

cycle where protective actions are needed depending on the working environment. In such cases, monitoring capability for exposure to radon daughters will be needed. Increased exposure to naturally occurring radioactive material (NORM) can occur in mining, extraction and processing of minerals containing uranium or thorium, and in activities involving the waste produced. The mining and processing of ores involves a large number of workers. For natural sources of radiation, internal exposure is the main exposure pathway due to radon in workplaces (for example internal exposure to radon due to inhalation of airborne dust).

The following industrial operations have been identified, roughly in descending order of priority, as being the most likely to involve some form of regulatory consideration for occupational radiation protection [18-24]:

(1) Extraction of rare earth elements;
(2) Production and use of thorium and its compounds;
(3) Production of niobium and ferro-niobium;
(4) Mining of ores other than uranium ore;
(5) Production of oil and gas;
(6) Manufacture of titanium dioxide pigments;
(7) The phosphate industry;
(8) The zircon and zirconia industries;
(9) Production of tin, copper, aluminium, zinc, lead, iron and steel;
(10) Combustion of coal;
(11) Water treatment.

For increased exposure to cosmic radiation at high altitudes, especially during flights, appropriate radiation protection strategies might be needed.

5.3.5 Nuclear reactors (including research reactors)

It is probably at nuclear power reactors that occupational radiation protection arrangements have been most comprehensively developed and exposure most rigorously controlled. Radiation protection programmes are generally comprehensive and subject to a management system. At nuclear power reactors, dosimetry is usually of the highest standard and often uses state-of-the-art techniques, such as remote transmission of live monitoring data to control stations. For ORPAS appraisals a high degree of competence and specialized experience will be needed in the team to conduct the review. Research reactors have lower power levels, but the operation is less routine so similar criteria as for nuclear power reactors apply. Additional details are included in IAEA Safety Standards Series No. SSG-16, Establishing the Safety Infrastructure for a Nuclear Power Programme [25].

5.3.6 Nuclear fuel cycle facilities

Establishing occupational radiation protection arrangements at fuel cycle facilities, especially fuel reprocessing facilities, is complex, demanding a high level of competence in all aspects of radiation protection. ORPAS appraisals need a high degree of competence and specialized experience in the review team. The potential hazards for workers include external exposure, internal exposure via contamination and exposure to neutrons of all energies.

5.4. TECHNICAL SERVICE PROVIDERS

The technical and scientific expertise that is necessary to carry out the regulatory functions and the implementation of occupational radiation protection requirements at operators' facilities and activities can be provided by technical service providers. A technical service provider is an organization or organizational unit designated or otherwise recognized by a regulatory body to provide expertise and services to support nuclear and radiation safety and all related scientific and technical issues**.** Characteristics and management of technical and scientific support are described in the IAEA TECDOC 1835 [26].

6. OVERVIEW OF THE ORPAS PROCESS

6.1. OVERVIEW OF THE PROCESS AND INITIAL STEPS

The ORPAS process flowchart is provided in Fig. 1 and consists of the following phases:

— Preparatory phase;
— Conduct of the mission;
— Completion and dissemination of the report and preparation of the action plan by the host country;
— Follow-up mission, if requested.

The activities included in each phase are described in more detail in Sections 7 to 11 of these guidelines.

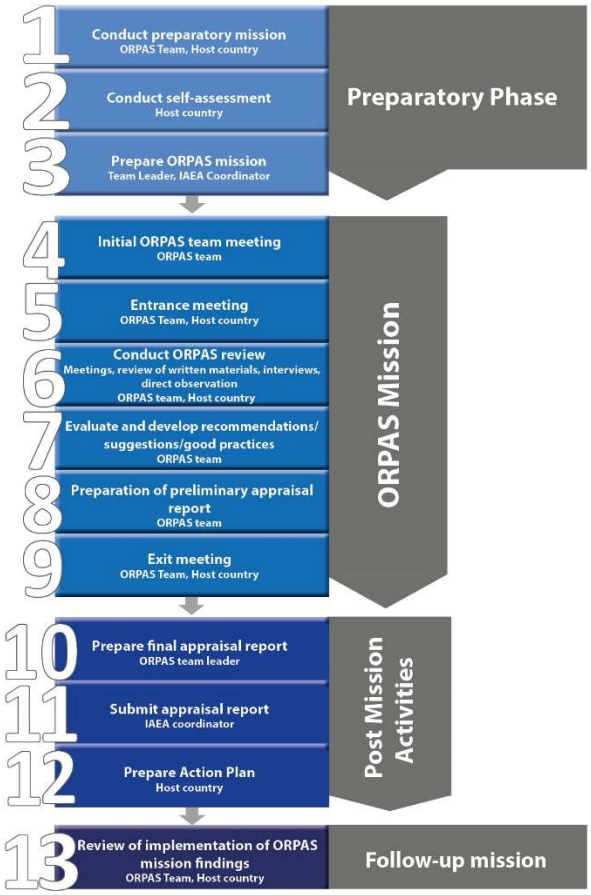

FIG. 1. The ORPAS review process.

The ORPAS mission is performed by an international team comprising senior experts with broad knowledge of occupational radiation protection and its application and extensive related experience, often in specialized areas. The ORPAS Review Team comprises designated IAEA staff and experienced international experts and is led by a senior expert from a Member State designated as the ORPAS Team Leader.

The outcome of an ORPAS mission is a report that is submitted through official channels to the host country. The ORPAS report's initial distribution is restricted to the participants concerned (National Counterparts) by the National Coordinator, the contributors to the report and the responsible IAEA staff. Countries are encouraged to make their ORPAS mission report public.

Confidentiality arrangements are in place to protect the individual information of the operators and technical support providers. ORPAS reports can be used to update the report for the host country in the thematic safety area on occupational radiation protection (TSA-2) in the IAEA's Radiation Safety Information Management System (RASIMS).

6.2. LANGUAGE TO BE USED IN THE ORPAS

The ORPAS questionnaires are currently available in English[4]. Although interviews during the mission can be conducted with the help of interpreters, the final report is written in English.

It is likely that the documents from the host country will be in the language of the host country unless they are translated into English. The visits to the operators and technical service providers and the interaction with the personnel from these organizations are likely to be feasible only in the official language of the host country. It is therefore advised that at least one of the ORPAS Reviewers is able to communicate in the language of the host country and necessary interpretation services are available.

The host country is encouraged to translate the final report into the local language.

7. PREPARATION FOR AN ORPAS MISSION

The preparatory phase for an ORPAS mission includes:

- Initial formal governmental request to the IAEA for an ORPAS appraisal;
- Development of an agreement between the IAEA and the host country on the scope of the proposed ORPAS mission;
- A preparatory meeting conducted in the host institute;
- Completion of the OPRAS self-assessment (questionnaires) by the host country;
- Forwarding to the IAEA of the advance reference material (see Appendix VII) prepared by the host country, including the completed ORPAS questionnaires, the report from the thematic safety area on occupational radiation protection (TSA-2) in the IAEA's Radiation Safety Information Management System (RASIMS), if available, and the initial action plan arising from the self-assessment outcomes;
- Identification of information that is confidential;
- Selection of the ORPAS Reviewers;
- Preparation of the preparatory meeting by the IAEA Coordinator;
- Mission agenda and logistics preparation.

During the preparation for an ORPAS mission the ORPAS Team Leader, IAEA Coordinator and host country will communicate and exchange information regularly.

7.1. STATE REQUEST FOR ORPAS APPRAISAL AND INITIAL ARRANGEMENTS

On receiving a request for information about ORPAS, the IAEA responds by forwarding a copy of these ORPAS Guidelines to the appropriate official (preferably to the assigned National Coordinator) in the requesting country. In due course, the country may submit a formal request for an ORPAS mission to the IAEA.

Alternatively, for some Member States where the IAEA believes an ORPAS would be beneficial, a letter to consider requesting an ORPAS mission, together with a draft proposal (e.g. sample request letter) may be forwarded to the State by the IAEA.

An ORPAS is initiated through a formal governmental request to the Deputy Director General and Head of the Department of Nuclear Safety and Security or to the Director of the Division of Radiation, Transport and Waste Safety or to the Director of the corresponding Technical Cooperation Division of the IAEA. States are encouraged to request an ORPAS mission simultaneously with a follow-up mission

[4] Work is in process to make the ORPAS questionnaires available in other official IAEA languages.

within a five-year period. On receipt of the formal request, the IAEA reviews the request and begins dialogue with the State.

An IAEA staff member of the Occupational Radiation Protection Unit of Radiation Safety and Monitoring Section of the Division of Radiation, Transport and Waste Safety is designated as 'IAEA Coordinator' and he or she contacts the host country:

— To identify the host country National Coordinator for the mission;
— To discuss the scope and expectations for an ORPAS self-assessment in preparation for the review mission.

The person nominated by the host country to be the National Coordinator is an important link between the host country and the ORPAS Team. The National Coordinator needs to be knowledgeable on all matters relating to the ORPAS and have a good understanding on the appraisal process as well as a good overview of the national occupational radiation protection arrangements. The host country National Coordinator usually has the characteristics of a team leader to access resources and has credibility with host country officials, staff of the national counterparts and ORPAS Reviewers.

The IAEA Coordinator discusses with the National Coordinator what will be involved in the appraisal, including the need for full cooperation with the ORPAS Team during the site visits. The IAEA and the host country discuss tentative dates for a preparatory meeting, if deemed necessary, and for the review mission itself, recognizing that these dates may need to be adjusted.

After determining the initial scope of the ORPAS mission, the IAEA Coordinator in conjunction with the host country recruits an ORPAS Team Leader and Deputy Team Leader.

7.2. SELECTION OF THE TEAM LEADER

The ORPAS Team Leader is selected by the IAEA Coordinator, in consultation with the host country. The Team Leader has appropriate skills to enable the appraisal to be carried out, is a senior expert from an IAEA Member State other than the host country and cannot have been involved in the development of the occupational radiation protection programme, including establishment or operation of technical service providers and national arrangements for that country. The Team Leader is selected as early as possible and at least six months in advance of the planned ORPAS mission. Section 7.5.2 provides more information about the qualifications of an ORPAS Team Leader.

7.3. IDENTIFICATION OF THE NATIONAL COUNTERPARTS

The IAEA Coordinator and the National Coordinator make a preliminary assessment of the organizations, practices and facilities that will be included in the appraisal. To assist in this selection a list of potential counterparts is given in Appendix III.

7.4. PREPARATORY MEETING

A preparatory meeting is conducted six to nine months before the mission and is normally held at the host institute's headquarters. The main purpose of the preparatory meeting is for the ORPAS Team Leader and IAEA Coordinator:

— To meet with host institutes staff (senior management, national coordinator, national counterparts), and exchange contact details;
— To introduce the ORPAS Team Leader to the host country;
— To inform the host institute about how the ORPAS review process works;
— To identify the host institute's priorities, aims and objectives for the mission;
— To explain the roles and responsibilities of the ORPAS Reviewers and the way they will interact with the host institute, other organizations and facility representatives;

— To explain the role of the host country National Coordinator and national counterparts before and during the review mission;
— To discuss and confirm the primary counterparts nominated by the host institute and other involved national counterparts;
— To discuss the advance reference material that the host institute will provide in advance of the review mission;
— To explain the importance of the timely provision of comprehensive and complete ORPAS questionnaires and a subsequent initial action plan by the host institute;
— To discuss and confirm the dates and scope of the mission;
— To agree an outline schedule for the mission and the logistical aspects;
— To agree the provision of any necessary support services by the host country;
— To explain pertinent IAEA policies (e.g. funding, contact with the media);
— To answer any questions the host institute and other national counterpart representatives may have and address their concerns to the extent possible.

The main elements of the preparatory meeting are presented in Appendix I. Emphasis is placed on ensuring that the host institute prepares a high-quality self-assessment and summary document and supplies sufficient advance reference material (ARM) for the ORPAS Reviewers to thoroughly prepare for the mission. Emphasis is also placed on ensuring that the national counterparts support and participate in the mission.

One of the outcomes of the preparatory meeting is the agreement to the documented terms of reference for the ORPAS mission. The agreement is endorsed by the representative of the host country (typically by the host country National Coordinator) and the IAEA Coordinator. The terms of reference summarize the milestones relevant to the preparation process for the ORPAS mission and provide clarity on the commitments of the host country and the IAEA, including arrangements for monitoring progress in implementing the action plan – for example, by means of a follow-up mission. This facilitates long-term planning by both parties.

A six to nine-month time interval between the preparatory meeting and the ORPAS mission is typically needed to enable the host country to complete its preparation in a timely manner (a longer period might be needed, in particular where documents have to be translated into English). Completion of ORPAS questionnaires could require several months depending on the extent of facilities and activities as well as technical service providers and regulatory body in the host country and staffing level of the host institute.

If the host country does not provide the completed ORPAS questionnaires and advance reference material in time to support the mission, the mission may be postponed. However, this step is only taken as a last resort and the decision is made by the IAEA Coordinator in consultation with the ORPAS Team Leader and IAEA management.

All ORPAS reviews are conducted in English and the host country provides the necessary interpretation services to enable the ORPAS Reviewers to work effectively.

The main elements of the preparatory meeting and a sample agenda are detailed in Appendices I and II.

7.5. SELECTION OF THE ORPAS TEAM

7.5.1. ORPAS Team size and composition

The number, key knowledge, skills and experience of the persons needed for the mission are determined in the agreed scope of the ORPAS mission. ORPAS missions typically include ten international experts recruited from Member States (excluding the host country) and selected by the IAEA in consultation with the host country. Special attention is given to avoid any potential conflict of interest.

An ORPAS Team, as appropriate, can include:

— An ORPAS Team Leader, recruited from a Member State;

— An ORPAS Deputy Team Leader, recruited from a Member State;
— An IAEA Coordinator (an IAEA staff member);
— ORPAS Reviewers, mainly recruited from Member States but can additionally include, where necessary, experts drawn from IAEA staff or external consultants to the IAEA;
— An IAEA administrative assistant (based at the IAEA Headquarters);
— Observers from other States that may participate with the agreement of the host country.

The size of the ORPAS Team and the duration of the mission are primarily determined by the available technical service providers and range of facilities, activities and practices included in the scope of the ORPAS. For large ORPAS Teams and broad scope reviews, two team members may be assigned joint responsibility for certain review areas.

Ideally, at least half of the ORPAS Reviewers in an ORPAS Team have previous ORPAS experience (as a reviewer or a national counterpart). The ORPAS Team Leader, in particular, is an experienced reviewer. ORPAS Reviewers are assigned into groups during ORPAS missions and each group includes at least one experienced ORPAS Reviewer. Potential reviewers are encouraged to take part in ORPAS training programmes organized by the IAEA.

All ORPAS Team members, including the ORPAS Team Leader, will have well developed knowledge and skills for the appraisal, including:

— Good communication skills;
— Good spoken and written English;
— Sound knowledge of the IAEA safety standards related to their review area;
— Good knowledge of the IAEA Safety Glossary [27];
— Professional knowledge and experience;
— Good technical knowledge in their area of expertise as well as an appreciation of the ‘bigger picture’;
— Good report-writing skills;
— An ability to work under pressure;
— A sense of responsibility for the mission as a whole;
— The ability and willingness to work in a team.

Additionally, ORPAS Team members (e.g. ORPAS Team Leader, ORPAS Deputy Team Leader, ORPAS Reviewers) have experience in the legislative and regulatory infrastructure for occupational radiation protection and technical services relating to protection and safety, such as services for personal dosimetry, services for calibration of monitoring and measuring equipment, or practical implementation of an occupational radiation protection programme. ORPAS Team members adopt an open attitude towards systems and approaches that vary from those with which they are familiar. Ideally, as many ORPAS Team members as possible are able to communicate in one of the official or commonly spoken languages of the host country (in addition to English). It important to note that no one from the host country can be included in the ORPAS Team.

Specific attributes can be considered for each ORPAS Team member:

— The ORPAS Team Leader is a senior expert from a Member State, experienced in the field of occupational radiation protection. The personal characteristics of this individual are fundamental to ensuring the success of a mission. In addition to the relevant professional and technical attributes the ORPAS Team Leader has:

  – Known leadership qualities;
  – Effective communication skills with good spoken and written English;
  – A clear mission vision;
  – Known ability to build effective teams;
  – Recent knowledge of global and local occupational radiation protection issues;

- A clear understanding of the peer review process and what needs to be done, ideally received through the participation in ORPAS training or other specialized training programmes.

— The ORPAS Deputy Team Leader has:

  - Experience as the chair of multi-disciplinary meetings;
  - Good knowledge of the relevant technical areas and an understanding of the wider peer review process;
  - The experience to reconcile varying points of view;
  - Good team building and management skills;
  - A good overview of the team's activities.

— The IAEA Coordinator is a staff member of the IAEA's Occupational Radiation Protection Unit of Radiation Safety and Monitoring Section and experienced in the application of the IAEA's international programme to protect workers from all types of exposure to naturally occurring or artificial radiation sources, in accordance with the most recent safety standards, scientific knowledge and information and IAEA peer reviews.
— The IAEA administrative assistant (based at the IAEA Headquarters) has experience in advanced information technology and document control techniques and working knowledge of the ORPAS process.

For ORPAS follow-up missions, depending on the extent and significance of the findings of the initial review mission, not all ORPAS Team positions need to be filled. The ORPAS Team Leader and the IAEA Coordinator consider whether other ORPAS Reviewers can adequately address those areas where few findings have been identified. This ensures that the follow-up mission is appropriately targeted and resource efficient. Detailed responsibilities of the ORPAS mission participants are provided in Appendix VI.

7.5.2. Recruitment of ORPAS Reviewers

The IAEA Coordinator, after appropriate consultation with the ORPAS Team Leader and ORPAS Deputy Team Leader, contacts potential ORPAS Reviewers through national contact points regarding their availability for the ORPAS mission. ORPAS Reviewers are then recruited and cleared for the mission in accordance with IAEA procedures and established agreements.

ORPAS Team members are recruited from Member States (excluding the host country) and can be experienced regulators, dosimetry specialists, radiation protection officers or experts in specific topics. National Coordinators identify a pool of national experts available for ORPAS missions and communicate this to the IAEA. However, the IAEA also invites reviewers through national contact points, subject to the agreement of their organizations, where appropriate. It is important that ORPAS Reviewers recognize the collective responsibility they have as part of the team. This will also be emphasized by the ORPAS Team Leader, who clearly communicates the expectations of the ORPAS Team and the mission. ORPAS Reviewers need to dedicate sufficient time for preparations and post mission activities.

To the extent possible, ORPAS Reviewers would be recruited from the same geographical region of the host country. For missions to countries receiving assistance from the IAEA, there may also be involvement of relevant IAEA Technical Cooperation (TC) staff subject to the required expertise on radiation safety and monitoring. Interactions with the Department of Technical Cooperation will be in accordance with the established IAEA procedures.

7.6. INITIAL ORPAS TEAM COMMUNICATIONS

Using the ORPAS mission scope and provisional schedule and taking into consideration that for each review area a leading expert is to be assigned, the IAEA Coordinator, in consultation with the ORPAS Team Leader, assigns specific tasks and responsibilities to the ORPAS Team members and confirms

that each agrees with and accepts his or her assigned responsibilities. This is done at the earliest opportunity so that the Team members can concentrate on their specific responsibilities.

Early team building, and orientation of the ORPAS Reviewers are vital steps in maximizing the effectiveness of the team during the mission. At the earliest opportunity, but at least four weeks before the mission, the ORPAS Team Leader, in coordination with the IAEA Coordinator, will contact ORPAS Reviewers as part of the team building process. Experience has demonstrated that early interaction facilitates mission preparation by providing initial insights and responses to ORPAS Reviewers' questions and concerns. The ORPAS Team Leader communicates to ORPAS Reviewers the expectations for the mission and:

— Reaffirms what review area will be assigned to the individual ORPAS Reviewers;
— Explains that the Mission Report Template is to be used from the very beginning;
— Invites the ORPAS Reviewers to familiarize themselves with the ORPAS questionnaires and carefully study the completed questionnaires for which they are responsible;
— Invites the ORPAS Reviewers to consult the web sites of the national counterparts of the host country;
— Invites the ORPAS Reviewers to prepare a 3-4 minutes presentation about themselves – both professional as well as personal – for the initial team meeting;
— Invites the ORPAS Reviewers to write their first impressions about the completed questionnaires in the First Impressions template (Appendix IV) and to send them to the ORPAS Team Leader and IAEA Coordinator at least two weeks before the mission;
— Invites the ORPAS Reviewers to prepare a preliminary list of questions belonging to their assigned questionnaires;
— The ORPAS Reviewers' first impressions of the host country self-assessment and initial action plan are summarized by the ORPAS Team Leader and are circulated to the ORPAS Reviewers and the host country before the mission.

7.7. PREPARATION BY ORPAS REVIEWERS

The ORPAS Reviewers are provided with all the information needed to complete their review. The information to be provided in advance of the mission includes:

— ORPAS questionnaires;
— IAEA Reference Material (Safety Standards);
— ORPAS Guidelines;
— Previous ORPAS reports (if needed and to be distributed under restricted distribution);
— Reports of previous review missions (if there were such missions with reference to 2.2);
— The report of the host country in the thematic safety area on occupational radiation protection (TSA-2) in the IAEA's Radiation Safety Information Management System (RASIMS);
— Report template;
— First impressions guidance;
— Other mission instructions or training.

Each ORPAS Reviewer is expected:

— To allocate sufficient time for a thorough review of the completed ORPAS questionnaires;
— To review the initial information and identify any additional issues relating to their assigned review areas;
— To assess the completed ORPAS questionnaires against the relevant IAEA Safety Standards;
— To form an initial opinion of the completed ORPAS questionnaires to which they have been assigned and identify priority review areas for the ORPAS mission;
— To provide written feedback to the IAEA Coordinator and the ORPAS Team Leader, at least two weeks before the mission, on any significant issues identified for their assigned review areas so

that, if necessary, there will be sufficient time to adjust the mission programme and logistics in response to the reviewers' inputs.

Each ORPAS Reviewer prepares a short summary after the review of the completed questionnaires, including the self-assessment and his/her initial observations (often referred as 'initial impressions' or 'first impressions') according to the relevant template and sends it to the ORPAS Team Leader and IAEA Coordinator at least two weeks before the mission. The short summary is also presented at the initial ORPAS Team meeting. Initial drafting of relevant parts of the ORPAS mission report is encouraged.

7.8. MISSION AGENDA AND LOGISTICS

Typically, ORPAS missions will be 6 to 10 days in duration.

7.8.1. Mission agenda

With the consideration of the programme and schedule samples from Appendix II, the IAEA Coordinator develops the initial programme and schedule for the mission in conjunction with the host country National Coordinator and the ORPAS Team Leader.

Based on the assignment of specific tasks to ORPAS Reviewers, there may be modifications to the original schedule. Any such modifications are agreed with the National Coordinator, who may also wish to propose modifications.

When finalizing the ORPAS mission schedule, attention is paid to ensure sufficient time is available for each part of the schedule, including site visits.

7.8.2. Mission logistics

In preparation for the ORPAS mission, the IAEA Coordinator will:

— Confirm and finalize all resourcing arrangements for the mission, particularly the source of funding;
— Confirm the dates for the mission with the host country National Coordinator, taking due account of any holidays, national vacation periods, work week structure and working hours;
— Confirm that appropriate travel arrangements have been made by the ORPAS Team, ensuring that all Reviewers are scheduled to arrive in the host country in sufficient time to attend the initial team meeting;
— Ensure necessary security training, dosimetry needs and clearance for the ORPAS Team, if needed.

The host country National Coordinator will:

— Make the necessary hotel reservations;
— Make arrangements for adequate working space for the ORPAS Team to enable them to work together and to hold discussions in reasonable privacy;
— Make arrangements for administrative support throughout the review;
— Make arrangements for printers, paper, computer, projector and audio-visual equipment;
— Make arrangements for communication (internet access, phones) between the ORPAS Team and their base organizations (especially the IAEA), and between reviewers in the host country;
— Arrange local transportation;
— Make arrangements for translators and technical escorts, if needed;
— Make the necessary arrangements for entry to the facilities, including clearance and any necessary training.

Each ORPAS Reviewer will:

— Obtain a visa, if needed;
— Undergo, as appropriate, the UN online security awareness training, BSAFE;

— Arrange to receive the necessary immunizations in good time;
— Make travel arrangements and provide their travel details to the host country National Coordinator and IAEA Coordinator;
— Bring a laptop computer with the appropriate electrical adapter, word processing, presentation and other software, as necessary, or inform the IAEA Coordinator if this is not possible, so that alternative arrangements can be made.

It is important to note that security clearance and obtaining visas for entry to the host country may take a considerable time. Underestimating this time factor may pose a risk to the scheduling or conduct of a mission.

8. CONDUCT OF THE ORPAS MISSION

8.1. INITIAL ORPAS TEAM MEETING

When all ORPAS Team members have arrived in the host country, an initial team meeting will be conducted (before the commencement of the ORPAS mission) to discuss the specifics of the mission including the methodology for the review and the evaluation. This will also include expectations regarding matters such as behaviours, team-working, communication and timekeeping.

Depending on the experts' previous experience, it may be necessary to devote a half day to the initial team meeting. Appendix III shows a typical agenda for the initial team meeting. It is important that all team members have a common understanding of the background, context and objectives of the ORPAS, the basis for the review (i.e. the IAEA safety standards and the State's completed ORPAS questionnaires with the initial action plan), the type of information needed and the way the information will be evaluated.

The IAEA Coordinator will brief the ORPAS Team on any issues, sensitive areas, priorities, schedule, approaches and expectations regarding the format and content of the deliverables by the ORPAS Team. The IAEA Coordinator will remind the team of the need to finish and agree on the preliminary report before the exit meeting. During the initial team meeting, the host country National Coordinator shares important information for the successful conduct of the ORPAS mission, such as information relating to logistics, security and dosimetry needs. The ORPAS Reviewers will also report the first impressions of their review area based on their in-depth review of the completed ORPAS questionnaires.

8.2. ENTRANCE MEETING

An entrance meeting will be conducted on the first day of the mission with senior management of the host country's regulatory body (be it one or several authorities), relevant government officials (such as Ministry of Health, Ministry of Employment, Ministry of Labour), representatives of technical service providers and representatives of operators. At the meeting, both the ORPAS Team and the host country present their primary objectives for the ORPAS mission.

The ORPAS Team Leader presents a brief outline of the plan, approach and expectations for the mission, emphasizing that it is not an inspection or audit, but it is a peer review conducted in cooperation with the national counterparts. A sample agenda for the entrance meeting is shown in Appendix II. National counterparts are expected to make brief presentations on the legislative and regulatory infrastructure for occupational radiation protection, technical services relating to protection and safety of workers, such as services for personal dosimetry and the calibration of monitoring and measuring equipment, and essentials of radiation protection programmes.

If necessary, there may be a more detailed introductory and informational meeting with senior representatives from officially participating organizations scheduled to be visited during the mission. This step could secure the goodwill and fullest cooperation of such organizations. If practicable, there are benefits to be gained from inviting as many as possible of the host country's personnel directly involved in the review, so that all are prepared and know what to expect. At this meeting the IAEA

Coordinator could give a general presentation on the IAEA's perspective on occupational radiation protection arrangements and the ORPAS mission process upon request from the host country.

8.3. ORPAS TEAM MEMBERS' COOPERATION AND CROSS-CONTRIBUTION

The ORPAS Team Leader has a clear responsibility to ensure effective team communication. Training and detailed discussion of the cross-contribution table in the report template (presented in Appendix VII) enhances the understanding by the ORPAS Reviewers of their respective roles and need for coordination. The ORPAS Team Leader establishes a systematic and simple process for ensuring that cross-cutting inputs are provided. In-group and inter-group discussions are a further tool for communication and cooperation. Cross-reading of the draft mission report by the other ORPAS Reviewers is essential.

8.4. DAILY REVIEWS

— ORPAS reviewers use the following three methods to acquire information to allow an objective review:
— Review of the completed ORPAS Questionnaires;
— Interviews with personnel and other officials during site visits;
— Direct observation at facilities and activities during site visits.

The review is conducted against the relevant IAEA safety standards and predominantly concentrates on national regulatory responsibilities for occupational radiation protection arrangements, functions and activities of technical service providers, and specific and national occupational radiation protection programmes. Observations are to be properly recorded in technical notes and reflected in the mission report.

It is vital to the effectiveness of the review and success of the mission that all review methods are conducted in a frank and open atmosphere. While conducting observations, interviews, or reviewing documentation, the ORPAS reviewers follow these principles:

— Keep an open mind;
— Maintain a questioning attitude and consider the credibility of sources;
— Gather data on as many aspects as possible;
— Keep detailed notes and records;
— Look for examples of both strong and weak performance (balanced approach);
— Stick to the facts and consider the context of their occurrence.

8.4.1. Review of the completed ORPAS questionnaires

The review of the ORPAS questionnaires has two stages. The first stage occurs before the start of the mission. The ORPAS Reviewers study the information provided by the host country together with other documents supplied by the IAEA. Results of the self-assessment including identification of actions for improvements as given in the initial host country action plan, are of particular importance. The results of this first stage are summarized in the written feedback report provided by each ORPAS Reviewer and form the basis of the initial opinion or first impressions presented by each reviewer at the initial team meeting.

The second stage takes place during the mission. Additional material in the form of regulations on occupational radiation protection and relevant regulatory guidance, technical service providers' procedures, quality management documentation, radiation protection programmes, presentations and examples of work will be reviewed. This information will be taken into consideration in analysing and formulating conclusions, recommendations and suggestions, and identifying good practices.

Good quality written material provided by the national counterparts improves the efficiency of the reviews, facilitates preparation of the mission report, minimizes risk of misunderstanding and helps concentrate minds on the areas considered important by the host institute.

8.4.2. Interviews and discussions with personnel and other officials

Interviews will be conducted at the facilities under appraisal with personnel having responsibility for the occupational radiation protection arrangements (e.g. licensee, director, radiation safety officer, radiation protection officer, senior physician, physicians, medical physicist, maintenance staff, responsible quality manager, occupational health specialist), together with the staff involved in the practice (e.g. radiographers, technicians, workers).

The prime objective of the interviews is to gather information not covered by the written material (as documented in the ORPAS Questionnaires) and where necessary, to seek clarifications on the written information provided (reliability of the written information).

When particular strengths become apparent during the discussions, the ORPAS Team members will ensure they are highlighted for inclusion in the report, and if appropriate, identified as good practices.

Interviews represent an important component of the mission, since, in addition to complementing and verifying written information, they provide an opportunity for the host country staff to discuss their practices and professional opinions with the ORPAS Reviewers. Thus, interviews will be conducted as a mutual exchange of views and not as an interrogation and allow time for counterparts to explain and contribute to the body of knowledge on the review area. Encouraging the description or demonstration of examples of the work carried out is an effective way to illustrate specific points.

8.4.3. Direct observation of the facilities and the workers during operation

Direct observation of activities in the offices and at the facilities is an essential part of the ORPAS mission and can provide valuable information complementary to the review of written material and the interviews. Observations provide evidence for the implementation of the occupational radiation protection programme in a facility and are used as a data source for conclusions and recommendations. To provide an objective judgment, two team members will be assigned per facility when it is necessary.

8.5. SITE VISITS

8.5.1. Purpose of a site visit

The main purpose of a site visit is to collect information that will enable an evaluation to be carried out of each review topic at the regulatory body, technical service providers and operational facilities.

The visit includes the review of relevant legislation with the regulatory body, radiation protection programmes at operator facilities, and operation of technical service providers and it is carried out during the activity of workers in the facility to have a clear understanding on the operation, performance of workers and the implementation of the radiation protection programme.

8.5.2. Site visit preparation

To minimize travel time and reduce disruption for the national counterparts, the general rule is to arrange only one visit to each organization or facility. The aim would be to cover all relevant review areas in a single visit, and this may mean that more than one person (interviewee) from the organization will need to be available during the visit. Before the meeting the ORPAS Reviewers, as far as is practicable, aim:

(a) To gain an understanding of the role of the organization;
(b) To identify those topics that are relevant to the appraisal and appropriate for that organization;
(c) To prepare accordingly the measurement equipment for any measurements at the workplace;
(d) To become familiar with the topics to be discussed;
(e) To be aware of the issues raised so far in the appraisal and their relevance to the organization;
(f) To prepare a structured opening statement which includes:
   - The name and experience of the ORPAS Reviewers;
   - A summary of the scope of the review mission;
   - The purpose of the visit;

– The type of questions that will be asked, with specific reference to the appropriate questionnaire.

While visiting facilities or activities the ORPAS Reviewers have to be accompanied by the radiation protection officer of the facility. If during the visit any incident is witnessed or identified as to cause unnecessary exposure to radiation of the workers, the public or the environment, the ORPAS Reviewers will communicate the situation to the radiation protection officer and assist in proposing measures to prevent any exposure.

During site visits Team members have to be accompanied by a host institute counterpart to facilitate the meeting and, if needed, to provide translation. In conducting the meeting, the ORPAS Reviewers will keep in mind that issues might arise due to translation from the host country language to that used for conducting the appraisal. In such situations, efforts have to be made to obtain confirmation of the key information provided.

8.5.3. Successful conduct of the site visit

The success of a visit is usually dependent on good preparation, which includes the briefing received by the National Counterpart and the prior understanding of the organization and its role by the ORPAS Reviewers.

The ORPAS Reviewers have to be prepared to accept the scheduling and arrangements made by the National Counterpart. They need to accommodate the wishes of the organization wherever possible, whilst making every effort to cover all the topics on their agenda.

The use of the OPRAS questionnaires, by both the National Counterpart and by the ORPAS team, will greatly facilitate the efficiency with which relevant information is collected. The questionnaires provide an effective agenda for the discussions and will help to limit discussions to those topics that are of importance to the review mission. Nevertheless, ORPAS Reviewers have to be prepared to deviate from the structure and content of the questionnaires if such action seems likely to assist the appraisal. In particular, alternative questioning routes might be beneficial in resolving any difficult or contentious issues that might arise. Flexibility, within a well-defined structure, can be the key to a successful visit.

During the visits, the ORPAS Reviewers observe the activities, if possible, question the workers about the conduct of their activities and, if allowed, obtain photographic evidence of the operations. Specific measurements at the workplace of dose rates, surface activity concentration, and operation of the ventilation system are advisable, whenever possible, and under the authorization of the facility management.

When particular strengths become apparent during the discussions, the ORPAS Reviewers will ensure that they are highlighted. Such actions assist in strengthening the constructive and co-operative intentions of the review mission.

8.5.4. Closure of the site visit

At the end of a site visit the ORPAS Reviewers:

— Thank the National Counterpart for their co-operation;
— Provide an initial feedback of the visit;
— Specify any follow-up actions for the interviewee(s), e.g. to provide additional documentary evidence;
— Explain that some issues may need further clarification after visits to other organizations;
— Offer to answer any final questions or concerns;
— Explain how and when the National Counterpart is likely to receive the results of the appraisal.

8.6. RECORDING AND EVALUATING OBSERVATIONS

The Reviewers will take detailed notes during each visit and this can be facilitated by the National Counterpart and the use of questionnaires or prepared checklists. The notes will record all relevant

information collected, together with the source of that information (name and organization). However, the specific sources of information will remain anonymous and will not appear in the review report. All interview notes taken by the ORPAS Reviewers are confidential and will not be provided to the host institute.

The aim is always to put interview notes into final form at the end of each day and discuss them during the daily team briefing. These notes include:

— A summary of points recorded during the interviews and their source;
— Comments on the role and responsibilities of the organization;
— Comments on the effectiveness and reliability of the organization;
— The relevant completed questionnaire;
— Documentation obtained;
— Comments on the strengths and weaknesses within the organization, as perceived at the time;
— A list of issues to be brought to the attention of the other Team members;
— Classification of the inputs against the occupational radiation protection framework previously selected; namely GSR Part 3, GSG-7 and other international standards;
— Identification of the need for additional data collection, including measurements to confirm the first assumptions;
— Understanding of the actual reasons for the actions collected in the facts (e.g. "what were the intended actions?" and "what was actually done?");
— Questioning of the collected facts;
— Medium to long term trends on the occupational doses received by the workers, training approaches followed by the organization, health surveillance programmes, safety culture.

It will not always be possible to reach overall conclusions at the end of individual site visits, because these may be affected by the outcome of other site visits. However, every attempt will be made to determine preliminary conclusions and, whenever possible, to record matters in the style of the appraisal report.

8.6.1. Recommendations

The ORPAS Reviewers propose recommendations where arrangements to meet the IAEA Safety Requirements are missing, incomplete, or inadequately implemented. Recommendations are specific, realistic and designed to result in tangible improvements to the occupational radiation protection programme effectiveness. Recommendations are based on the IAEA Safety Requirements, and the basis (i.e. the relevant Requirements) for the recommendation is clearly documented in the mission report. All identified non-compliances against IAEA Safety Requirements lead to a recommendation. Recommendations are formulated such that they are succinct and self-explanatory. They clearly specify the responsible party and use 'should' language (for example, "the regulatory body should…"; "the technical service provider should…"). Recommendations that the national counterparts consider that they may take a long time to be implemented, or that the ORPAS Team considers as a high priority, include interim goals, which would be set out in the ORPAS report and in due course, by agreement, would be transferred to the host country's updated action plan.

8.6.2. Suggestions

The ORPAS Reviewers may identify opportunities for improvement not directly related to inadequate conformance with the IAEA Safety Requirements. Suggestions are means of achieving this aim. Suggestions can contribute to improvements in national arrangements for occupational radiation protection but are primarily intended to stimulate the National Counterpart's management and staff to consider new or different approaches that could enhance performance. Each suggestion has a basis either in the IAEA Safety Requirements or in the Safety Guides, as appropriate. The basis for the suggestion is clearly documented in the mission report. Suggestions are formulated such that they are succinct and self-explanatory. They clearly specify the responsible party and use 'should consider' language (for example, "the National Counterpart should consider…"). A suggestion can be proposed

in conjunction with a recommendation or may stand on its own following a discussion of the associated background.

8.6.3. Good practices

The ORPAS reviewers identify a good practice in recognition of an outstanding arrangement, programme or performance superior to those generally observed elsewhere. It will be worthy of the attention of others as a model in the general drive for excellence. Good practices also reference a basis similar to suggestions, and the basis is clearly documented in the mission report. Notable aspects of arrangement, programme or performance that do not fully meet the good practice criteria can be highlighted in the text of the report.

8.7. DAILY TEAM MEETING

The ORPAS Team and the National Coordinator are expected to attend the daily team meeting, held at a defined time at the end of each day. Each ORPAS Reviewer summarizes the day's observations and records insights and judgements in notes to support effective discussion of all review areas at the team meeting. The purpose of the daily meeting is to discuss the main observations of the day and to coordinate the next day's activities. This meeting offers the opportunity for the ORPAS Reviewers to consolidate their views, reach consensus where necessary and formulate the way in which their observations are to be captured in the final report.

The ORPAS Team Leader will establish the style and conduct of these meetings. It is important for the daily team meetings to be conducted in an efficient manner to allow the ORPAS Reviewers enough working time on their review areas. Daily team meetings are not intended to provide a forum for detailed reporting by the ORPAS Reviewers of their activities. These meetings are to be as short as possible and concentrate on the presentation of issues which form the basis for recommendations, suggestions or good practices and information that might be relevant to the other ORPAS Reviewers. A standard agenda might:

— Highlight the day's key observations in each review area, particularly significant concerns or positive features which may form the basis for recommendations, suggestions or good practices;
— Report issues which need to be brought to the attention of other ORPAS Reviewers, especially issues that have a bearing on the remainder of the ORPAS mission;
— Identify gaps, overlaps and areas where the information is not clear or is inconsistent;
— Determine whether any of the day's observations might affect the remaining schedule for the mission;
— Summarize the visits and interviews to be conducted during the next day to enable all team members to provide input on the key topics to be addressed;
— Exchange information among the ORPAS Reviewers regarding their plans for future interviews;
— Determine the status of each ORPAS Reviewer's written input to the draft ORPAS preliminary report.

During the daily team meetings, the ORPAS Team members share insights and observations. The ORPAS Deputy Team Leader moderates the meetings and keeps a strict pace to keep the meetings as short as possible (typically one hour).

8.8. PREPARATION OF THE PRELIMINARY REPORT

The ORPAS report is drafted using a report template (Appendix VII) that is provided to the ORPAS Team by the IAEA Coordinator. The ORPAS Reviewers are providing daily written inputs to the draft ORPAS Report, commencing at the earliest opportunity. Their inputs are updated as necessary throughout the mission.

The evaluation of observations is expressed in concise conclusions. Conclusions have their basis in known facts and formally documented evidence relating to the IAEA Safety Standards. For example, a finding might be that legislation contains a provision addressing a particular topic. The conclusion would state whether this provision is consistent with the IAEA Safety Standards and, if not, how it is

deficient. Additional information provided by other OPRAS Reviewers at the daily meetings is taken into consideration in refining the conclusions. Conclusions logically form the basis for development of recommendations, suggestions and good practices.

In developing conclusions, the ORPAS Reviewers:

— Consider how effectively laws, regulations and procedures are implemented in practice in comparison to the IAEA Safety Standards;
— Consider the key elements of the operations of technical service providers and of the implementation of radiation protection programmes;
— Identify where the elements of the national occupational radiation protection programme differ from those of the IAEA Safety Standards;
— Identify the significance of differences relative to the IAEA Safety Standards.

As information is collected and evaluated, conclusions specific to a review area can be developed. Specific conclusions in multiple review areas are examined to determine if a generic conclusion may be derived or to confirm that the conclusion is limited to a single review area. This is important to avoid the repetition of recommendations and suggestions throughout the ORPAS Preliminary Report.

The report text is concise without unnecessary details, but at the same time includes all the information needed to support each observation. Observations can be formulated as recommendations, suggestions or good practices.

The ORPAS report text clearly documents the validation (or otherwise) of the host country's self-assessment and initial action plan as a preface to the ORPAS Reviewers' findings. Where the ORPAS Team identifies recommendations or suggestions that have already been identified in the host country's self-assessment and initial action plan this is acknowledged in the report. This approach is made clear to the host country before the mission. In particular, it is clearly noted that the numbers of recommendations, suggestions and good practices is in no way a measure of the status of the occupational radiation protection arrangements of the national counterparts in the host country.

Observations are separated from the text of the report in the form of a table or box. Observations may be formulated as recommendations, suggestions or good practices. The observations table or box has three fields for: 'Observation'; 'Basis from the IAEA Standards'; and 'Recommendation, Suggestion, Good Practice'.

The 'Observation' field contains a short paragraph summarizing the facts that have been explained in the text. When a recommendation or suggestion is given, the 'Observation' field states the fact that leads to the non-compliance with the IAEA Safety Standards. The 'Observation' field includes a reference to the initial action plan if the action plan includes the appropriate action for improvement.

The 'Recommendation, Suggestion, Good Practice' field for the recommendations and suggestions is directed to the organization responsible for implementation (e.g. regulatory body, technical service provider).To avoid duplication of recommendations or suggestions when a similar issue is identified across different parts of the report, the observation is placed in the part of the report where it has the most significance. Due reference to this recommendation or suggestion appears in all those parts of the report for which the recommendation or suggestion is applicable.

The ORPAS Team Leader checks whether each recommendation and suggestion is specific, measurable, achievable, realistic and timely according to the information on national circumstances available to the ORPAS Team. This approach is followed to improve recommendations and suggestions proposed by the ORPAS Reviewers, and to ensure consistency.

The ORPAS Team Leader, during the daily team meeting, provides for discussions and formulation of the team's conclusions and observations (the potential recommendations, suggestions and good

practices). The ORPAS Team Leader and the IAEA Coordinator ensure that the report is factually correct and that the content is agreed rather than try to resolve differences in reporting styles.

The ORPAS Team Leader continuously cross-checks the preliminary report draft for comprehensive coverage of the scope of regulatory oversight, for accuracy and for contradictions or inconsistencies. The ORPAS Reviewers are encouraged to communicate the recommendations, suggestions and good practices that have been preliminarily agreed with the team, and the report text, to the counterparts at the earliest opportunity so that the national counterparts' feedback can be obtained.

8.9. FINALIZATION OF THE PRELIMINARY REPORT AND COUNTERPART REVIEW

During the latter part of the mission, the IAEA Coordinator, together with the ORPAS Deputy Team Leader will compile the preliminary ORPAS Mission Report comprising the individual and collective inputs from the ORPAS Reviewers to capture the results of the review of the host country's national occupational radiation protection programme. It is important that the mission schedule allows sufficient time for the ORPAS Team to review and agree the significant points and for the national counterparts to review the preliminary report. The ORPAS Team seeks to have an opportunity to discuss any final points made by the national counterparts, particularly where these may lead to adjustments to the content of the preliminary report.

The ORPAS Team Leader ensures that there is cross-reading of the draft preliminary report by the ORPAS Reviewers that were not involved in the interviews and the drafting of the report parts that they are cross-reading. This cross-reading is done to confirm comprehensive coverage of the scope of the occupational radiation protection programme oversight, accuracy and the absence of contradictions or inconsistencies.

Final checking of the preliminary report by the ORPAS Team Leader and Deputy Team Leader is arranged to avoid repetition in description and findings. The National Coordinator is invited to comment on the report to ensure technical and factual accuracy and common understanding of its content in consultation with the national counterparts. Recommendations, suggestions and good practices included in the preliminary report are in a finalized stage and not to be modified further. Keeping in mind that the final decision regarding the conclusions belongs to the ORPAS Team, the ORPAS Team Leader has to ensure that recommendations and suggestions are realistically achievable and understood by the host country. The ORPAS Team Leader also has to seek assurance that due priority and resources will be given to the implementation of the recommendations and suggestions in accordance with the host country's updated action plan.

The ORPAS Team Leader together with the Deputy Team Leader and the IAEA Coordinator develop the executive summary. The executive summary sets out the background to the mission, including the mission dates, composition of the ORPAS Team, the scope of the mission and the findings that are addressed. Acknowledgement is given to the host country's preparation of the self-assessment and initial action plan and management of the mission arrangements. The executive summary acknowledges those areas where recommendations and suggestions made by the ORPAS Team had been identified by the host country before the mission and addressed in the initial action plan. It also indicates areas of good practice that the ORPAS Team considers to be drawn out. This is a means of giving visible credit to the observations and commitments of the host country. Reference is made to the issue of a press release.

At the end of the mission, a copy of the preliminary report is handed to the National Coordinator. 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 ORPAS Team Leader.

8.10. COLLECTING FEEDBACK

The day before the exit meeting the IAEA Coordinator solicits feedback from the ORPAS Reviewers and the host country through the National Coordinator, regarding the effectiveness of the ORPAS

process, including whether the ORPAS mission objectives were attained. The feedback also includes proposals for potential improvements to the ORPAS process and the IAEA Safety Standards.

8.11. EXIT MEETING

The ORPAS mission concludes with an exit meeting. The exit meeting is normally attended by:

— The ORPAS Team;
— The National Coordinator and national counterparts;
— The head of the hosting institute;
— Representatives of other organizations involved in the ORPAS mission.

The exit meeting includes a presentation by the ORPAS Team Leader on the main observations of the mission. The format of the exit meeting presentation may vary. It includes a description of the mission, the composition of the ORPAS Team, the areas reviewed, the activities conducted, the strengths identified, the areas for improvement, and other observations that the ORPAS Team feels need to be highlighted to the host country. The ORPAS Team members may, as appropriate, provide a brief verbal report of conclusions in their own review areas. The ORPAS Team Leader explains to the host country that the preliminary report will need further review and subsequent approval by both the host (through the National Coordinator) and the IAEA before the final mission report is issued.

The exit meeting is closed with an IAEA official statement. The statement can be made by another IAEA official, who may have joined the ORPAS mission a few days before the exit meeting and who has been briefed on the results of the mission by the ORPAS Team Leader and the IAEA Coordinator.

9. POST-MISSION ACTIVITIES

9.1. FINAL REPORT

The National Coordinator will collate the final comments of all participating national counterparts on the preliminary report and submit the complete set to the IAEA Coordinator within an agreed time schedule. The comments from the National Coordinator are limited to issues relating to factual correctness of information contained in the preliminary report, not to the agreed recommendations and suggestions.

Upon receipt of the comments from the National Coordinator, the IAEA Coordinator with the ORPAS Team Leader and appropriate coordination with the other OPRAS Reviewers, will assess the host country comments and draft the final ORPAS Report; the goal being to issue this final report within two months following receipt of host country comments. Editing of the final ORPAS Report is organized by the IAEA Coordinator. The final report is approved by the Team Leader before the final issuance. The report is submitted through official channels to the State concerned and its distribution is restricted to the host country, ORPAS Team members and appropriate IAEA staff. During the first 90 days after issuing the report any further distribution will be at the discretion of the host country. The host country is encouraged to make its ORPAS mission report public.

The results of the ORPAS mission can be considered as inputs for future IAEA activities, such as technical cooperation support projects, extra-budgetary programmes and identification of regulatory trends and issues.

9.2. ACTION PLAN

Based on the findings of the ORPAS Report, the host country updates its initial action plan (originally derived from the self-assessment). The updated action plan will be used to implement recommendations and suggestions set out in the ORPAS Report. In some cases, the updated action plan might also indicate what ongoing IAEA input or assistance might be provided to the State (e.g. documentation, expert missions, training, provision of technical services). However, the decision to implement an updated action plan to address the ORPAS recommendations and suggestions lies entirely with the relevant

authorities of the country concerned. The host country can decide to request an IAEA expert mission to advise how recommendations and suggestions can be addressed and review progress with the implementation of the updated action plan. Such missions cannot be considered as a substitute for the ORPAS follow-up mission.

10. ORPAS FOLLOW-UP MISSION

10.1. OBJECTIVES OF THE ORPAS FOLLOW-UP MISSION

Recognizing the importance of continuous improvement, the host country is encouraged to request an ORPAS follow-up mission simultaneously with the initial mission within a five-year period and to incorporate self-assessments in its integrated management system. If requested by the State, an ORPAS follow-up mission can also include the review of specific occupational radiation protection areas not previously covered (this would usually be defined as an 'extended follow-up' mission). In this case the ORPAS Guidelines relevant to the initial mission apply to these areas.

The purpose of an ORPAS follow-up mission is:

— To review progress in implementing improvements resulting from the initial ORPAS mission recommendations or suggestions;
— Where appropriate, to address areas of significant change since the last mission, including any new topics as requested.

10.2. REQUESTING AN ORPAS FOLLOW-UP MISSION

An ORPAS follow-up mission will normally be requested formally by the State to the IAEA Deputy Director General and Head of the Department of Nuclear Safety and Security or the Director of the Division of Radiation, Transport and Waste Safety or the Director of the corresponding Technical Cooperation Division of the IAEA. In some circumstances the IAEA might suggest that the State considers requesting a follow-up mission.

The ORPAS follow-up mission also provides an opportunity for the IAEA, international OPRAS Reviewers and host country to identify additional technical issues for review and to identify further good practices. A minimum of nine months is normally needed to prepare a follow-up mission.

10.3. PREPARATORY PHASE OF AN ORPAS FOLLOW-UP MISSION

On receipt of a request for an ORPAS follow-up mission an IAEA Coordinator will be assigned who will arrange for:

— The establishment of the National Coordinator;
— The recruitment of the ORPAS Team Leader;
— The recruitment and briefing of the ORPAS Reviewers in conjunction with the ORPAS Team Leader.

A preparatory meeting is conducted approximately six months before the follow-up mission. The preparatory meeting is attended by the ORPAS Team Leader and the IAEA Coordinator. At the same time, the host institute nominates a National Counterpart in each review area to be the primary contact with the respective ORPAS Team. Where possible, the preparatory meeting is to be held at the host institute's headquarters to allow senior management and other organizations involved to participate. The meeting considers:

— The specific purpose of the ORPAS follow-up mission to determine whether significant changes since the initial mission or the additional topic areas proposed can be effectively addressed within the scope of an 'extended follow-up' mission;
— The impact of any scope extension to determine the appropriate mission duration and the team size;

— The host institute's preparation for the follow-up mission, including a list of the documentation required for the review;
— The preparation of the necessary documentation;
— The logistical support needed.

An outcome of the preparatory meeting is the agreement in the form of documented terms of reference for the ORPAS follow-up mission. The agreement is endorsed by the representative of the host country (typically the National Coordinator) and the IAEA Coordinator. A template for the terms of reference is provided in Appendix V.

10.3.1. ORPAS follow-up mission team composition

The team will comprise an ORPAS Team Leader, an IAEA Coordinator, and a Deputy Team Leader together with the appropriate number of ORPAS Reviewers. For reasons of continuity it is preferable that the follow-up mission includes the ORPAS Team Leader, IAEA Coordinator and ORPAS Reviewers who participated in the initial mission, or at least reviewers with previous ORPAS experience. If the follow-up mission will encompass new review areas, additional ORPAS Reviewers with the appropriate expertise are recruited. As with the initial mission, no one from the host country may be included in the ORPAS Team. The inclusion of observers from other States may be proposed by the IAEA for consideration by the host country.

The roles and responsibilities of the ORPAS Team members for the follow-up mission are similar to those assigned for the initial mission.

10.3.2. Advance reference material for the ORPAS follow-up mission

Before the start of the follow-up mission ORPAS Team members will review the advance reference material provided by the IAEA, which includes the report prepared by the host country in preparation for the ORPAS follow-up mission. The advance reference material for the follow-up mission outlines any significant changes to the advance reference material provided for the initial mission and also includes an evaluation of the status of recommendations and suggestions set out in the report of the initial ORPAS mission. The advance reference material from the initial ORPAS mission is also made available to the follow-up ORPAS Team.

The results of a self-assessment undertaken in preparation for the follow up mission, if applicable, and the status of implementation of the action plan updated after the initial mission is also submitted by the host country and included in the advance reference material. The advance reference material is provided at least two months in advance so there will be adequate time for a thorough review of the material.

In the case of an 'extended follow-up' mission the advance reference material will also give full information related to the extended parts according to the guidance applicable to initial missions.

10.4. CONDUCT OF AN ORPAS FOLLOW-UP MISSION

10.4.1. Review of the host country responses to the findings of the initial ORPAS mission

The review of the responses to the recommendations and suggestions made during the initial ORPAS mission will be carried out following these ORPAS Guidelines. In the same way as for the initial mission, information needed to reach a judgement will be collected by a combination of the review of written material, interviews with personnel and direct observation of organizations, practices and activities.

The main written material for this activity will be the advance reference material, including the updated action plan developed by the host country after the initial ORPAS mission and any further self-assessments on progress against the action plan items. However, additional written material would be necessary to demonstrate the measures implemented and progress made. The ORPAS Reviewers will be looking for evidence of the progress and may consequently provide further advice as appropriate.

10.4.2. Additional review areas
If additional review areas are included in the scope of the mission, they will be reviewed in accordance with the guidance applicable to the initial mission and presented in previous sections of these guidelines; the results of the review are reported in the same way as for an initial mission.

10.4.3. Documentation
During the course of the follow-up mission, ORPAS Reviewers write notes on their observations and conclusions. For the review of progress on the improvement plan actions, the reviewers will assess:
— Actions completed;
— Actions in progress;
— Further review necessary.

Additional advice can be provided using new recommendations or suggestions. For areas that were covered in the initial mission and are subject to new recommendations or suggestions, it has to be emphasized that the benchmark (i.e. the IAEA standards to be used as basis) is the one that was available at the time of the initial mission. If a new or revised IAEA standard has been published between the initial mission and the follow-up mission, it will not be used during the follow up mission. However, the host country will always be encouraged to adopt in a timely manner the latest version of the IAEA Safety Standards.

On completion of the review, the IAEA Coordinator will prepare the ORPAS follow-up report summarizing the team's main observations, conclusions, recommendations, suggestions and identified good practices. Before the text is finalized, the National Coordinator will be given the opportunity to comment regarding the accuracy and clarity of the report's contents. The finalized report will be submitted through official channels to the host country.

10.4.4. Analysis of observations from an ORPAS follow-up mission
The follow-up mission reviews the progress made by the State in implementing actions in response to the ORPAS mission recommendations or suggestions and expresses the results of this review as conclusions. The following categories are used for expressing these conclusions:

— Recommendation and/or suggestion remains open;
— Recommendation and/or suggestion is closed on the basis of progress made and confidence in effective completion in due time;
— Recommendation and/or suggestion is closed.

In exceptional circumstances, a recommendation or suggestion raised during the initial ORPAS mission might no longer be relevant to the ORPAS follow-up mission. This might, for instance, be due to changes that have occurred in the regulatory organization, regulatory framework or processes in the intervening period. Where such an instance occurs, the initial recommendation and/or suggestion may be amended accordingly or closed.

10.4.5. Schedule
An ORPAS follow-up mission has a sufficient duration to thoroughly review the actions taken in response to the previously identified recommendations and suggestions. The duration also allows for the preparation of a comprehensive preliminary report of the follow-up mission before the exit meeting. Experience has shown that in addition to the review period, a further two days might be needed for final discussions and drafting of this report.

The programme for the mission is agreed in advance. All follow-up missions have formal entrance and exit meetings. The first half-day of the follow-up mission would normally involve presentation of information contained in the most recent advance reference material. The date of the next ORPAS mission can be discussed at the end of the follow-up mission, but this is not essential.

10.4.6. Updating the ORPAS database
ORPAS follow-up missions are designed to monitor the progress in implementing recommendations and to update the mutual understanding of the current status of national occupational radiation protection arrangements, in terms of their compliance with the IAEA Safety Standards. Updated

information on compliance (i.e. implementation of ORPAS recommendations and suggestions) derived from ORPAS follow-up missions, other progress review missions and/or progress reports is periodically entered into the relevant OPRAS database.

11. REVIEW OF THE ORPAS INITIAL AND FOLLOW-UP MISSIONS

Following ORPAS initial and follow-up missions, the IAEA Coordinator conducts a meeting with all IAEA staff involved to elicit feedback and to discuss lessons learned from the mission. The meeting considers any feedback on the methodology, ORPAS process and the mission itself submitted by the ORPAS Reviewers or presented as a view of the IAEA staff in the mission. If any insights arise from the mission for the future strengthening of the IAEA Safety Standards, the IAEA Coordinator raises these insights at the meeting for assessing their relevance. Agreed outcomes and lessons learned from the mission are documented in a memorandum to file and distributed to the appropriate Division Directors (including Technical Cooperation, if applicable). These proposals can be taken into account, as appropriate, in strengthening the ORPAS process, methodology and tools, as well as in the review of the IAEA Safety Standards.

Upon conclusion of the mission, the IAEA Coordinator ensures that principal insights and conclusions regarding the mission (as documented in the mission report) are provided to appropriate IAEA technical officers.

Consideration is given to holding international workshops to promulgate lessons learned from ORPAS missions, both in terms of process and technical matters.

APPENDIX I: MAIN ELEMENTS OF THE PREPARATORY MEETING FOR AN ORPAS MISSION

This appendix presents the main elements of the preparatory meeting for an ORPAS mission and can be taken into consideration when developing the schedule for the mission.

1. Discussions on the aims of the ORPAS mission to be held between the ORPAS Team Leader, the IAEA Coordinator and the host country senior management, including the National Coordinator.

   The objective of the discussions is to:

   (a) Confirm the scope of the appraisal;
   (b) Identify the counterparts;
   (c) Agree the composition of the ORPAS Team, i.e. expertise required, number of reviewers, other specific requests for ORPAS Reviewers;
   (d) Agree, as appropriate, on the participation of observers.

2. Presentations by the National Coordinator on the host country's occupational radiation protection programme, including regulations on occupational radiation protection, provision of services by technical service providers and implementation of radiation protection programmes by operators.

3. Presentation by the IAEA Coordinator to the host country on the ORPAS methodology.

   This part of the meeting allows the IAEA Coordinator to:

   (a) Explain the ORPAS methodology covering:

      - The overall process;
      - The roles and responsibilities of all the national counterparts;
      - The schedule;
      - The entrance meeting;
      - The ORPAS questionnaires, document review, interviews and direct observation;
      - The development of observations, conclusions, recommendations, suggestions and good practices;
      - The drafting of the mission report;
      - The exit meeting.

   (b) Explain (and provide) the IAEA GSR Part 3, GSG-7 and other relevant Standards, which are used as the basis of the ORPAS;
   (c) Explain the nature and purpose of the ORPAS questionnaires;
   (d) Present example results of previous ORPAS missions to give the National Coordinator and national counterparts an understanding of typical results and what is expected.

4. Discussions with National Counterparts.

   Presentations of 15 to 20 minutes need to be arranged with the individual counterparts covering topics such as their role, the infrastructure, the technical services, the occupational radiation protection programmes.

   The purpose is to:

   (a) Allow the counterparts to explain their arrangements;
   (b) Provide the counterparts with an opportunity to ask questions about the mission;
   (c) Discuss any specific requests from the National Coordinator or national counterparts regarding the focus of the ORPAS appraisal;
   (d) Identify locations to be visited (site visits).

5. Discussion of the practical and logistical aspects of the mission between the ORPAS Team and the National Coordinator.

Several basic logistical items need to be discussed so that an understanding is reached on what will be provided. These discussions cover the following items:

(a) Mission schedule, including logistics for the members of the ORPAS Team for site visits;
(b) Planning of the entrance meeting;
(c) Arrangements for the ORPAS Reviewers, such as their arrival in the host country, accommodation, meals;
(d) Working areas within the host institute offices, clerical and secretarial support in English with at least one room at the disposal of the ORPAS Team to enable them to work and to hold discussions in reasonable privacy;
(e) Forms to be filled out in advance for visas, security badges, and detailed contact information;
(f) Need for interpretation and translation of documents;
(g) Personal protection equipment (e.g. safety shoes, safety glasses);
(h) Side safety briefings and dosimetry needs.

APPENDIX II: ORPAS MISSION SCHEDULE

This appendix provides templates to assist in the development of the schedule for the ORPAS preparatory meeting and the ORPAS initial and follow-up missions.

II.1. TEMPLATE FOR THE ORPAS PREPARATORY MEETING SCHEDULE

DAY 1	
Welcome, Introductions Opening remarks by the ORPAS Team Leader Introduction by the IAEA Coordinator Self-introduction of all attendees Objectives of the preparatory meeting ORPAS Mission expectations from the host	Counterpart and IAEA
ORPAS Appraisal Service and the scope of the preparatory and main missions	IAEA
Current occupational radiation protection arrangements status, an overview on the regulatory framework in the host country, technical services for radiation protection and typical operator facilities	Counterpart
Technical service providers and their operations	Counterpart
Occupational radiation protection provisions for operators and radiation protection programmes	Counterpart
The IAEA perspective on occupational radiation protection arrangements (GSR Part 3 and GSG-7)	IAEA
Round table discussion on logistics and practical arrangements for the ORPAS mission: • Confirmation of the facilities to be visited during the preparatory meeting; • Mission dates and scope; • Roles and responsibilities of ORPAS Reviewers, National Coordinator and national counterparts; • Self-assessment process; • Accommodation and local transport arrangements (including site visits); • Working areas and facilities for individuals and ORPAS Reviewers (on-site and off-site, including the hotel); • Information technology support, data-projectors, secretarial support.; • Arrangements for communication between ORPAS Reviewers and national counterparts; • Translators and technical escorts, if needed. Review of the day, summary and conclusions.	Counterpart and IAEA
DAY 2	
Logistics for the ORPAS mission (Continued) • Process for interviews and document review; • Necessary arrangements for entry to facilities, including clearance and any necessary training; • Initial team meeting (time, participants);	Counterpart and IAEA

• Entrance meeting (time, participants); • Direct observation and site visits (date, duration, participants); • Discussion and agreement on ORPAS questionnaires; • Exit Meeting (time, venue participants); • Media relations; • Meetings with State officials; • Social events.	
Site visit* to a selected site for verification of the logistics, including transportation and process for entering the site.	Counterpart and IAEA
Site visit* to selected sites	Counterpart and IAEA
DAY 3	
• Review of the detailed mission programme • Summary of meeting and follow-up items	Counterpart and IAEA
End of preparatory meeting	IAEA and Counterpart

*In each facility or service (e.g. individual monitoring service facility, medical centre, industrial facility, industrial radiography company, site with naturally occurring radioactive materials.)

Typical tasks during the Site visits;

The Facility or Service:	**The IAEA:**
o Arranges meetings with the management and the officers responsible for radiation protection arrangements o Presents the services provided and the structure of the organization o Presents the occupational radiation protection programme and responsibilities	o Promotes the use of self-assessment and the tools; o Informs on the scope and objectives of the full appraisal; o Agrees on the list of people and sites to be visited during full appraisal; o Informs on timing of review mission (as appropriate); o Informs on the framework for the schedule of meetings (as appropriate).

II.2. ORPAS MISSION SCHEDULE

DAY	Activity	Remarks
1	**Initial Team meeting**	Attended by the ORPAS Team to refresh understanding and discuss on initial impressions and findings based on the completed ORPAS questionnaires
2	**Entrance meeting**	Attended by the ORPAS Team and all ORPAS national counterparts
	Welcoming address	Counterpart
	Opening of ORPAS Mission	Counterpart
	Remarks by the ORPAS Team Leader	Team Leader
	Remarks by the IAEA	IAEA
	Introduction of the ORPAS Team	ORPAS Team
	'ORPAS' within the Framework of the IAEA Review Missions and OPRAS Mission Process	IAEA
	Group photo session	ORPAS participants
	Presentations by national counterparts	Maximum 20 min. per organization
	Concluding remarks and introduction of site visits programme o Round table discussion to clarify the scope of the appraisal & the agenda for the site visits	Counterpart and IAEA
	Daily adjourn	Counterpart and IAEA

SCHEDULE OF SITE VISITS

DAY	**Group #**		**Location of the site visit**	**Accompanying person from the host institute**
3	#			
	#			
	All	Daily team meeting		
4	#			
	#			
	All	Daily team meeting		
5	#			
	All	Daily team meeting		
6	#			
	All	Daily team meeting		
7	All	Preparation of preliminary appraisal report to develop recommendations, suggestions & good practices		ORPAS Reviewers
8	All	○ Presentation of preliminary report ○ Discussions on preliminary report		Counterpart and IAEA
	All	Final ORPAS team meeting		-
9	All	**Exit Meeting**		To be attended by the ORPAS Team and all ORPAS national counterparts
		Introduction of Preliminary Report		ORPAS Team Leader
		Closing		IAEA and Counterpart
		Wrap-up meeting Discussions on the draft Action Plan		IAEA and Counterpart

II.3. ORPAS FOLLOW-UP MISSION SCHEDULE

Initial Team Meeting	
International ORPAS Team members To refresh understanding and discuss on ORPAS report, recommendations and suggestions	
Entrance meeting	
Welcome, Introductions Opening remarks by the ORPAS Team Leader Introduction by IAEA Self-introduction of all attendees Objectives of the ORPAS follow-up mission ORPAS Follow-up Mission expectations from the Host Institute Site visit programme	Counterpart/ IAEA
Site visits	
Visits to selected sites for verification of ORPAS findings in connection with the action plan	Counterpart/ IAEA
Report preparation	
Preliminary report of the follow-up mission for the preparation of the conclusions: o Recommendation and/or suggestion remains open; o Recommendation and/or suggestion is closed on the basis of progress made and confidence in effective completion in due time; o Recommendation and/or suggestion is closed; o New recommendation and/or suggestion.	
Exit meeting	
Introduction of preliminary ORPAS follow-up report	Counterpart/ IAEA
End of meeting	IAEA/ Counterpart

APPENDIX III: IDENTIFICATION OF NATIONAL COUNTERPARTS

This appendix provides a list of potential national counterparts to take part in an ORPAS mission:

— The regulatory body (in some cases this may be more than one organization).
— Government ministries with an involvement in and/or responsibility for occupational radiation protection arrangements. Typically, these may include the following, but the precise titles will vary from country to country:
  - Ministry of Health;
  - Ministry of Employment or Ministry of Labour;
  - Ministry of Industry;
  - Ministry of Energy or Ministry of Nuclear Energy;
  - Ministry of Civil Aviation;
  - Ministry of Transport;
  - Ministry of Mines and Mineral Resources;
  - Ministry of Science and Technology.

— Technical service providers (note that the term covers those providing radiation protection services to several organizations, and those supplying a single organization or facility):
  - External dosimetry services for photon, beta and neutron radiation;
  - Internal dosimetry services including whole body counter measurements, thyroid counter measurements for direct monitoring, bioassay laboratories providing indirect monitoring;
  - Radon dosimetry service;
  - Central record-keeping facility;
  - Secondary standard dosimetry laboratories and other calibration facilities;
  - Testing of radiological instruments;
  - Advisory services;
  - Education and training facilities.

— Operators of facilities and activities using ionizing radiation (note that in most circumstances only a very limited selection of operators would be included in a review mission, and only representative facilities from within each selected activity):
  - Diagnostic radiology departments in hospitals;
  - Radiotherapy departments in hospitals including external beam therapy and internal therapy (e.g. brachytherapy);
  - Nuclear medicine departments in hospitals using diagnostic and/or therapeutic techniques;
  - Industrial radiography (non-destructive testing);
  - Irradiation facilities (industrial and research);
  - Industrial (nuclear) gauging applications, such as thickness (mass) measurements, level detection, moisture determination, well-logging;
  - Analytical techniques (industrial and research) such as diffraction, fluoroscopy, neutron activation techniques;
  - Research activities (industrial and academic laboratories) using, for example, sealed sources and generators and unsealed radioactive materials;
  - Mining, mineral extraction and processing facilities (industrial activities involving naturally occurring radioactive material);
  - Research reactors and nuclear research facilities;
  - Nuclear power reactors;
  - Fuel cycle facilities including enrichment, fuel fabrication and reprocessing facilities;
  - Radioisotope production facilities and source manufacturing;
  - Uranium mines and processing facilities;
  - Any workplaces with significant concentrations of natural radionuclides.

APPENDIX IV: FIRST IMPRESSIONS TEMPLATE

FIRST IMPRESSIONS ON THE ORPAS ADVANCE REFERENCE MATERIAL	
Name and Country of the Reviewer:	
Host Country:	

The reviewers are expected to review the completed ORPAS questionnaires and other relevant advance reference material summary reports related to their review areas. They need to be familiar with the IAEA Safety Standards relevant to their review areas (particularly GSR Part 3 and GSG-7), and with the ORPAS Guidelines. At least two weeks before the mission the reviewer is requested to return her/his first impressions in the format and with the content indicated in this table.

1. ISSUES TO INVESTIGATE AND OPEN QUESTIONS

List in brief (possibly in bulleted format) the potential issues that need further interviewing and/or discussion to clarify whether they present any non-compliance with the IAEA Safety Requirements. List also those issues that are not clearly described in the ORPAS questionnaires or in the advance reference material summary report and need further clarification during the interviews. In the list please identify the location of the issues in the text (e.g. by page number, paragraph number, line number).

- …
- …

2. DRAFT RECOMMENDATIONS
List in brief (possibly in bulleted format) those issues found in the ORPAS questionnaire or in the advance reference material summary report which seem to be in non-compliance with an IAEA Safety Requirement related to the review area. Give reference to the requirement non-complied with by identifying the number and subject of the Safety Requirement (e.g. GSR Part 3 Requirement 24: Arrangements under the radiation protection programme) and, if possible, the relevant paragraph (e.g. 3.88). Please also identify the location of the issues in the text (e.g. by page number, paragraph number, line number).
○ … ○ …

3. DRAFT SUGGESTIONS
Based on the ORPAS questionnaires and the advance reference material summary report list in brief (possibly in bulleted format) any further actions and/or changes to be undertaken by the relevant ORPAS National Counterpart (e.g., regulatory body, technical service provider, operator, employer, licensee, registrant) that, although not related to any non-complying activity of the counterpart, can contribute to further improving the occupational radiation protection arrangements in the host country. Give reference to parts of the IAEA Safety Requirements or Safety Guides (in the form given in the previous section) that underline and may serve as basis for your suggestion. Please also identify the location of the text that indicates and/or implies your suggestion.
○ … ○ …

4. ANY FURTHER COMMENT OR OPINION
Give any further comment or opinion you feel appropriate or necessary related to your review. This may include: o Facts or statements that you consider important to include into the mission report; o Facts or considerations that you consider interesting for reviewers of areas other than yours; o Potential good practices, i.e. activity and/or practice of the national counterparts, that is outstanding and unique and worth in the implementation of the Safety Standards.
o … o …

APPENDIX V: TEMPLATE FOR THE ORPAS TERMS OF REFERENCE

Terms of Reference

Occupational Radiation Protection Appraisal Service – ORPAS
[Insert year]

[Insert Host Country name]

Version No. [Insert number]

BACKGROUND

ORPAS MISSION DATES (Preparatory meeting and mission)

OBJECTIVES OF THE PREPARATORY MEETING

Liaison with the host organization to agree a programme of visits to operators (such as hospitals, industrial radiography companies) and technical services providers (such as individual monitoring laboratories, dosimetry laboratories, advisory services) that will participate in the appraisal process.

Meetings with the identified operators and technical service providers to present the appraisal process, and introduction of the ORPAS self-assessment questionnaires, including a demonstration of SARIS.

ORPAS questionnaires

ORPAS TEAM COMPOSITION

MAIN COUNTERPARTS

CONDUCT OF MISSION

Self-assessment status

Action plan

LOGISTICS

SCHEDULE

ADVANCE REFERENCE MATERIAL

Scope

Date of delivery to the IAEA

REPORT CONFIDENTIALITY

[DATE, SIGNATURES OF NATIONAL COORDINATOR AND IAEA COORDINATOR]

ATTACHMENT I: ORGANIZATIONS AND LOCATIONS FOR INTERVIEWS AND SITE VISITS DURING THE ORPAS MISSION

The detailed list of organizations will be provided separately by the National Coordinator.

No.	Organization (National Counterpart)	Location
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

ATTACHMENT II: SCHEDULE FOR THE ORPAS MISSION

The proposed detailed schedule will be provided by the National Coordinator

REFERENCES

APPENDIX VI: RESPONSIBILITIES OF MISSION PARTICIPANTS BY ROLE

V.1. ORPAS TEAM LEADER

It is important that the ORPAS Team Leader is able to get an overview of all activities that take place during the mission and that he/she has enough time to take leadership. The ORPAS Team Leader may also be assigned as a reviewer. The ORPAS Team Leader is primarily responsible for:

- Serving as an ORPAS liaison, in conjunction with the IAEA Coordinator, with the government and/or regulatory body, host institute and national counterparts during the mission;
- Working closely with the Deputy Team Leader and IAEA Coordinator early before the mission;
- Coordinating with the IAEA Coordinator for external interaction related to the conduct of the ORPAS mission;
- Actively contacting the ORPAS Reviewers and structuring the preparatory phase;
- Providing leadership and explaining his/her expectations;
- Helping the ORPAS Reviewers to overcome initial stress and starting to create team spirit;
- Determining the division of responsibilities between the ORPAS Team Leader and the Deputy Team Leader;
- Directing the team early in the process towards main objectives, identifying deliverables, assigning tasks and responsibilities to the ORPAS Reviewers;
- Leading the ORPAS mission, including supervising the review, ensuring schedules are met and providing leadership in the resolution of issues that might arise;
- Leading the initial team meeting, and the entrance and exit meetings;
- Ensuring that the ORPAS Team works in a consistent and cohesive manner;
- Cross-checking the draft report for comprehensive coverage of the scope of mission;
- Recognizing and managing strengths and weaknesses of Reviewers;
- Communicating with ORPAS Reviewers on a regular basis before and during the mission, in order to ensure team members are adequately prepared and informed;
- Ensuring that the objectives of the ORPAS are met;
- Providing guidelines for the conduct of the daily meetings;
- Developing an overall picture of the effectiveness of the occupational radiation protection programme of the host country, to be reflected in the executive summary and press release, using the IAEA Safety Requirements as a reference;
- Coordinating with the National Coordinator and the IAEA Coordinator to prepare public information, if needed during the mission;
- Conferring on appropriate changes to the draft report in consultation with the ORPAS Team members, based on comments received from the host country;
- Obtaining the approval for the final report before the final issuance.

V.2. ORPAS DEPUTY TEAM LEADER

The ORPAS Deputy Team Leader supports the ORPAS Team Leader in his/her functions. The ORPAS Deputy Team Leader is primarily responsible for:

- Working closely with the ORPAS Team Leader and IAEA Coordinator early in advance of the mission;
- Identifying appropriate ORPAS Reviewers based on the established work plan, in conjunction with the ORPAS Team Leader and IAEA Coordinator;
- Conducting daily team meetings during the mission;
- Sharing leadership responsibilities with the ORPAS Team Leader, especially with the daily coaching of the ORPAS Team;
- Ensuring that all observations relevant to non-compliance with the IAEA Safety Requirements lead to the appropriate recommendation;
- Assisting the IAEA Coordinator with the preparation of the preliminary ORPAS report;

— Assisting the ORPAS Team Leader with the initial team meeting, entrance meeting and exit meeting;
— Undertaking roles as assigned by the ORPAS Team Leader.

V.3. IAEA COORDINATOR

The IAEA Coordinator is primarily responsible for:

— Serving as official IAEA liaison with the host country before, during and after the ORPAS mission;
— Assuring IAEA representation at meetings with government officials, if the meetings are related to the ORPAS mission;
— Preparing a briefing for the host country on the ORPAS process, including providing a copy of these ORPAS Guidelines;
— After consulting with appropriate IAEA technical officers, determining the scope and terms of reference of the ORPAS mission, paying due regard to the IAEA cooperation plan for the country (if the country is receiving IAEA assistance);
— Supporting consistency with other ORPAS missions and lead activities before and after the mission and ensuring the standardized timing of preparatory meeting and post mission activities;
— Requesting completion of the self-assessment and ORPAS questionnaires by the appropriate organizations in the host country, and ensuring the receipt of the completed questionnaires by the IAEA in a timely manner (preferably two months before the commencement of the ORPAS mission);
— Working closely with the ORPAS Team Leader and Deputy Team Leader early in advance of the mission;
— Identifying appropriate ORPAS Reviewers, in conjunction with the ORPAS Team Leader;
— Recommending to the ORPAS Team Leader the assignment of tasks and responsibilities to the ORPAS Reviewers;
— Managing resources, such as financial arrangements for the ORPAS Team, coordinating travel for the ORPAS Reviewers, and ensuring the provision of special equipment, dosimeters, and logistics, as needed;
— Interacting with the appropriate sections or divisions of the IAEA;
— Providing ORPAS Reviewers with appropriate preparatory meeting information, in particular, providing access to the completed ORPAS questionnaires after they are submitted to the IAEA and providing the information on the review of the questionnaires, mission report template, preparation of the first impressions, preparation for interviews and preliminary report drafting;
— Providing guidance to the ORPAS Team Leader and ORPAS Deputy Team Leader to help ensure that the objectives of the ORPAS mission are met;
— Collating the preliminary report of the ORPAS with the assistance of the ORPAS Deputy Team Leader, based on the contributions from the ORPAS Reviewers, and determining which, if any, portions of the report need to be in a confidential annex;
— Assisting the ORPAS Team Leader and the host institute to prepare public information announcements relating to the mission, if needed;
— Preparing the draft report based on the preliminary report and comments received from the host country and ORPAS Reviewers;
— Submitting the draft report to the host country for comments following IAEA approval;
— Finalizing the report based on the comments received from the host country;
— Sending the final report to the host country following IAEA approval;
— Coordinating with other IAEA sections or divisions for input that might be applicable to the review.

V.4. ORPAS REVIEWERS

ORPAS Reviewers are responsible for:

— Making necessary preparations for the ORPAS mission, based on information provided by the IAEA Coordinator;
— Reviewing and studying the completed ORPAS questionnaires and host country action plan and preparing the feedback report;
— Conducting the ORPAS mission as directed by the ORPAS Team Leader;
— Participating in the initial team and entrance meetings;
— Taking the lead during the interviews in sites; before entering into detailed discussions with the national counterparts reaching common understanding of the applicable IAEA Safety Requirements which will form the basis for observations;
— Reviewing the technical areas against the IAEA Safety Standards;
— Evaluating their observations;
— Making recommendations for all identified non-compliances against IAEA Safety Requirements;
— Jointly reviewing with the ORPAS Team all observations, conclusions, recommendations, suggestions and good practices;
— Providing input to the preliminary report daily, as directed by the ORPAS Team Leader;
— Reviewing the completed preliminary report;
— Maintaining appropriate confidentiality of sensitive information in accordance with their confidentiality agreement;
— Providing comments to the IAEA on the ORPAS process, after completion of the mission.

V.5. IAEA ADMINISTRATIVE ASSISTANT

The IAEA Administrative Assistant acts in full coordination with the IAEA Coordinator and is primarily responsible for:

— Preparing the IAEA response to the official ORPAS request;
— Preparing the cost estimate for the mission;
— Sending requests for governmental nomination of ORPAS Team members, where necessary, and official invitations to the ORPAS Team members;
— Liaising with and providing information to the ORPAS Team members on various organizational and logistics aspects of the mission and compiling information on these matters from the ORPAS Team members to be forwarded to the counterpart;
— Ensuring that a share point repository is ready for the mission and give access to all experts to review the advance reference material; upload to the repository support documents (e.g. IAEA safety standards, ORPAS Mission reports, ORPAS Guidelines);
— Providing guidance and support on organizational and administrative aspects and mission logistics to the ORPAS Team members;
— Compiling the mission report and ensuring correct spelling, syntax and grammar; and assisting with language and formulations in the report during cross-reading;
— Keeping the actual master copy of the draft mission report and disseminating it to the ORPAS Reviewers as agreed with the ORPAS Team Leader;
— Distributing the mission report by using official channels;
— Keeping the ORPAS achieve and database up-to-date:
— Finalizing accounts.

V.6. HOST COUNTRY NATIONAL COORDINATOR

The host institute appoints a National Coordinator who is an experienced, senior member of the staff. The National Coordinator has a key role in the effective coordination of the mission and the role includes:

— Arranging logistics, administration, scheduling and documentation for the mission;

— Being the main contact and focal point with the ORPAS Team Leader and IAEA Coordinator in the preparatory phase of and during the mission;
— Being the conduit between the ORPAS Team and the host institute;
— Informing the host institute staff on what the ORPAS mission entails:
— Attending team meetings throughout the ORPAS mission;
— Being available throughout the mission.

For large missions, the host institute might consider appointing a Deputy National Coordinator to assure continuity of support for the ORPAS Team during the mission.

V.7. HOST COUNTRY NATIONAL COUNTERPARTS

A counterpart is a staff member of an official ORPAS participating organization who is the primary contact with the ORPAS Reviewers for this particular facility throughout the mission. A counterpart would normally be the director (head) of the regulatory body with a specific focus on occupational radiation protection, the manager of the technical service provider or the radiation protection officer for an operator facility. The counterparts:

— Lead the preparation of the written responses to the ORPAS questionnaire relevant to the activities of their organization and ensure the relevant documentation is provided;
— Coordinate the communications between the ORPAS Team and respective national counterparts;
— Participate in the review related to their area of responsibility;
— Provide complete and correct information and facilitate understanding.

V.8. OBSERVER

The main purpose of an observer taking part in an ORPAS mission is to provide another Member State with first-hand insight into the ORPAS process. The scope of the observer's involvement is agreed to by the ORPAS Team Leader, the host institute and the observer's country before the start of the mission. Typically, an observer would be expected to participate to and attend the ORPAS Team activities and prepare notes concentrating on aspects of the benefits to the observer's own country and discuss them with the ORPAS Team Leader.

APPENDIX VII: FINAL ORPAS REPORT

VI.1. DRAFTING SCHEDULE

All parties have to aim to adhere as closely as possible to the following drafting schedule, since undue delays will inevitably reduce the impact and the credibility of the review mission. This schedule will be incorporated into each person's, and each organization's plans at the outset of the review process. The IAEA Coordinator will maintain a record of the dates when each stage of the following schedule is satisfactorily completed.

Stage	Schedule	Responsibility
Prepare outline of draft report	Before commencing the review mission	Team Leader
Prepare preliminary appraisal report (main findings only)	Before the exit meeting in the host country	Team Leader (with the assistance of the whole team)
Complete preliminary appraisal report (including the reports of national counterparts for specific facilities)	Within two weeks of returning from the host country	Team Leader
Review completed preliminary appraisal report	Within two weeks of receiving the report from the Team Leader	Reviewers
Create draft appraisal report	Within two weeks of receipt of all comments from the Team members	Team Leader
Finalize formatting, final editing and IAEA approval	Within one week of receipt of draft appraisal report from the Team Leader	IAEA Coordinator
Dispatch draft appraisal report to host country for comments	Immediately	IAEA Coordinator
Collect comments from all participating organizations in the host country and send to the IAEA Coordinator	Within four weeks of receipt of the report from the IAEA Coordinator	National Coordinator
Consider host country comments and agree on necessary modifications	Within two weeks of receipt of comments from host country	Reviewers
Complete final appraisal report	Within one week of agreeing on any modifications with the Team Leader	IAEA Coordinator
Distribute appraisal report	Within sixteen weeks after the completion of the mission visit	IAEA Coordinator

VI.2. STRUCTURE OF THE FINAL REPORT

The structure of the ORPAS final report contains two parts. Part I gives a general description of the process, the main findings, recommendations, suggestions and good practices of the review mission. Part II gives specific observations, findings and recommendations for each facility included in the mission scope and might be subject to restricted circulation.

PART I	o Introduction o Description of the Occupational Radiation Protection Appraisal Service o Outline of the ORPAS procedure o Details of the meetings and visits during the review mission o Findings, conclusions, recommendations, suggestions and good practices on review areas (regulatory body, operator and technical service provider) o Feedback to the IAEA, if any o Supporting annexes: Participating organizations and list of ORPAS Team members o About follow up mission or any future actions
PART II	o Facility descriptions (national counterparts) and list of persons met o Detailed findings of the individual facilities appraisal o Conclusions and recommendations

APPENDIX VIII: ADVANCE REFERENCE MATERIAL

The advance reference material (ARM) for a typical ORPAS review includes:

— The ORPAS Guidelines;
— GSR Part 3 and GSG-7;
— The relevant safety requirements, guides and safety reports;
— The preparatory meeting report;
— The completed ORPAS questionnaires;
— The completed report for the host country in the thematic safety area on occupational radiation protection (TSA-2) in the IAEA's Radiation Safety Information Management System (RASIMS);
— Other supporting documents from the host country (e.g. regulation, reports).

The following supporting documentation is necessary for the preparation of the mission:

A. National legal framework:

— Laws and other legal instruments governing occupational radiation protection;
— Synopsis of the constitutional legislative system of the host country and the responsibilities of the various government departments that deal with occupational radiation protection;
— An outline of the administrative structure of government departments and other bodies dealing with occupational radiation protection;
— Regulations on occupational radiation protection;
— Identification of the stakeholders and their expectations.

B. Regulatory body organization and procedures:

— Legal status and responsibilities assigned by law to the regulatory body;
— Objectives of the regulatory body for occupational radiation protection;
— Structure, organizational chart, staffing numbers and a demonstration of the sufficiency of the regulatory body resources and organizational structure;
— Requirements applicable to occupational radiation protection;
— Description of the authorization process;
— Procedures for assessment and review of technical submissions;
— Inspection practices for occupational radiation protection;
— Enforcement practices for occupational radiation protection;
— Roles and responsibilities of the regulatory body in relation to nuclear or radiological emergencies for protection of emergency workers;
— Annual or other reviews of, for example, occupational exposures;
— The number of occupationally exposed workers (including the number of those, whose dose is individually monitored and the number of those, for whom the occupational exposure is assessed on the basis of the results of workplace monitoring), the types and number of authorized activities, and the status of the technical service provider in charge of the monitoring and of the training of the occupationally exposed workers;
— Approval procedures for service providers, such as dosimetry laboratories;
— List of service providers in radiation safety and security of radioactive sources and the range of services provided;
— Management system documentation, including internal procedural instructions.

C. ORPAS questionnaires:

Regulatory body:

— General responsibilities of registrants, licensees and employers;
— General responsibilities of workers;
— Legal regulatory framework;

— Monitoring programmes technical services;
— Requirements for radiation protection programmes.

Technical service providers:

— Technical service providers for external dosimetry;

  - General requirements for the approval of external dosimetry services;
  - External dosimetry services provided;
  - Dosimetric specifications;
  - Dosimeter type testing;
  - Dosimeter performance testing;
  - Management system.

— Technical service providers for internal dosimetry

  - General requirements for the approval of internal dosimetry services;
  - Internal dosimetry assessment methods provided;
  - Direct measurement methods;
  - Biokinetic models for internal dosimetry and interpretation of measurements;
  - Indirect measurement methods;
  - Dosimetric quantities and calibration procedures;
  - Management system.

— Technical service providers for dose record keeping

  - Dose record keeping service approval;
  - Basic details of dose record keeping service;
  - Management system.

— Technical service providers for workplace monitoring

  - General requirements for the approval of workplace monitoring services;
  - General requirements for workplace monitoring (radiation and/or contamination measurements) programme;
  - Workplace monitoring (radiation and/or contamination measurements) services provided;
  - Testing and use of radiation measurement equipment;
  - Workplace monitoring (radiation and/or contamination) management system specific requirements;
  - Management system general requirements;
  - General technical services;
  - General requirements for the provision of technical services;
  - Management system for technical services.

Operators:

— Authorization details and details for transport of radioactive material,
— Control of radioactive material,
— Control of radioactive sealed sources,
— Co-operation between employers, licensees and registrants;
— Health surveillance;
— Individual monitoring programme;
— Intervention in emergencies;
— Management structure;
— Management system;
— Radiation protection measures;

— Radiation protection programme;
— Staff selection, information and training;
— Workplace monitoring programme.

D. Technical service provider's documentation

— Quality management system documentation;
— Documents for measurement, assessment and improvement of performance;
— Working documents and job descriptions;
— Results of intercomparison exercises;
— Operating manuals for equipment and software;
— Reagent safety data sheets;
— Requirements of national authorities (laws and regulations);
— Managerial standards;
— Technical standards;
— External documents not within the scope of influence of the service provider;
— Procedure for control of documents to include periodic review of valid documents.

E. Radiation protection programmes of facilities

The systematic arrangements aimed at providing adequate consideration of radiation protection measures to be reported, include;

— Radiation protection organization (manager and personnel);
— Radiation dose and medical surveillance of exposed workers (radiation work categories and surveillance);
— Area and zoning based on radiation exposure conditions;
— Radiation work permit;
— Radiation protection training;
— Radiation protection procedures;
— Control.

Necessary documentation includes;

— Assignment of responsibilities (decision making, corresponding organizational arrangements, including itinerant workers, advisory committee);
— Designation and functions of qualified experts (radiation protection, internal and external dosimetry, workplace monitoring, ventilation, occupational health, radioactive waste management);
— Integration of occupational radiation protection arrangements with other areas of occupational health and safety arrangements (industrial hygiene, industrial safety and fire safety);
— System for the accountability for radiation generators and radioactive sources (inventory at each location, description of each radiation generator or radioactive source, activity, physical and chemical form);
— Designation of controlled and supervised areas;
— Local rules (to follow and supervise the work);
— Provision of personal protective equipment;
— Arrangements for monitoring workers and the workplace;
— System for recording and reporting;
— Education and training programme;
— Methods for reviewing and auditing;
— Emergency plan;
— Programme for workers' health surveillance;
— Requirements for the assurance of quality and process improvement.

REFERENCES

[1] 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).

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, INTERNATIONAL LABOUR OFFICE, Occupational Radiation Protection, IAEA Safety Standards Series No. GSG-7, IAEA, Vienna (2018).

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ABBREVIATIONS

IRRS	Integrated Regulatory Review Services
NORM	Naturally occurring radioactive material
ORPAS	Occupational Radiation Protection Appraisal Service
SARIS	Self-assessment of Regulatory Infrastructure for Safety
RASIMS	Radiation Safety Information Management System
TSA	Thematic Safety Area

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Consultancy Meeting

Vienna, Austria: 24-28 August 2015

Workshop

Vienna, Austria: 5-7 February 2019

IAEA
International Atomic Energy Agency

No. 26

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