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Evaluation of the Status of National Nuclear Infrastructure Development

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EVALUATION OF THE STATUS OF NATIONAL NUCLEAR INFRASTRUCTURE DEVELOPMENT

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IAEA NUCLEAR ENERGY SERIES No. NG-T-3.2

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FOREWORD

An appropriate infrastructure is essential for the safe, reliable and peaceful use of nuclear power. The IAEA was encouraged to assess ways to meet infrastructure needs and to provide guidance to Member States considering the introduction of nuclear power. All of these countries face the challenge of building the necessary nuclear infrastructure for the first nuclear power plant. The IAEA is responding to this demand through increased technical assistance, missions and workshops, and with new and updated technical publications.

A holistic view of the infrastructure for nuclear power was published in Considerations to Launch a Nuclear Power Programme (GOV/INF/2007), targeted mainly at policy makers. Milestones in the Development of a National Infrastructure for Nuclear Power, an IAEA Nuclear Energy Series publication (No. NG-G-3.1) issued in 2007, provided more detailed guidance on the three phases of development outlined in Considerations to Launch a Nuclear Power Programme. It describes the sequential development through the three phases for each of 19 infrastructure issues, ranging from a government's national position on nuclear power to the procurement of items and services for the first nuclear power plant.

Member States requested additional guidance on determining how to assess the progress of their infrastructure development for nuclear power programmes. This report was prepared in response to their request. It provides an evaluation approach for the status of national nuclear infrastructure development based upon the guidance presented in the Milestones publication mentioned above.

The evaluation approach provides a comprehensive means to determine the status of the infrastructure conditions covering all of the 19 issues identified in the Milestones publication. This approach can be used by any interested Member State for self-evaluation in order to establish what additional work needs to be completed to develop the appropriate national infrastructure. In addition, the approach can be used for the implementation of external evaluations (international peer review) with the participation of the IAEA and independent external experts. Such reviews, where a Member State wishes to invite others to carry out an evaluation, will help determine the degree of progress in developing and implementing national nuclear infrastructure areas for which IAEA assistance is requested.

The IAEA can, upon request, assist in implementing holistic reviews of infrastructure preparedness at different stages in the development of national nuclear programmes. In particular, 'milestone 2' as defined in the Milestones publication, is a key stage at which the Member State needs to demonstrate that it is "ready to invite bids for the first nuclear power plant". Through the use of this report's comprehensive self-assessment, this stage is the point in time at which the Member State is encouraged to present its readiness for the construction of the first nuclear power plant to a wider audience. This review will help the Member State enhance national and international confidence in the country's ability to embark upon a nuclear power programme, including among potential nuclear power plant suppliers.

The preparation of this technical publication was based upon contributions from external experts. The IAEA wishes to acknowledge the assistance provided by the many contributors listed at the end of this report. S. Mortin (United Kingdom) drafted the original version of the manuscript.

The IAEA officers responsible for this publication were R.I. Facer and N. Pieroni of the Division of Nuclear Power.

EDITORIAL NOTE

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CONTENTS

1. INTRODUCTION

1.1. BACKGROUND

A nuclear power programme is a major undertaking requiring careful planning, preparation and investment in time and human resources. While nuclear power is not alone in this respect, it needs careful consideration because of the issues associated with the possession and handling of nuclear material. The development of a nuclear power programme entails attention to many complex and interrelated issues over a long duration. The introduction of a nuclear power programme involves a commitment of at least 100 years to maintain a sustainable national infrastructure through operation, decommissioning and waste disposal.

The IAEA supports the safe and peaceful use of nuclear power by providing standards, guidance, reviews and assessments, inspections and assistance related to:

— Technology;
— Safety and security;
— Safeguards.

The IAEA publication Milestones in the Development of a National Infrastructure for Nuclear Power [1] describes the detailed infrastructure needed to support these three areas, in order to support the safe, reliable and peaceful use of nuclear power. It identified 19 separate infrastructure issues to be addressed by a Member State considering the introduction of nuclear power as part of its national energy strategy. It was noted that early attention to all of the issues identified would facilitate the efficient development of a successful nuclear power programme. Equally, lack of appropriate attention to any of the issues is likely to result in future difficulties that may significantly affect the successful introduction of nuclear power.

As with any major programme, the commitment of resources to a nuclear power programme needs to be phased and decisions to move to subsequent phases, where the commitment of resources will increase significantly, need to be made with a full understanding of the requirements, risks and benefits. The Milestones publication referred to above therefore identified three distinct phases in the introduction of a nuclear power programme and identified separate conditions for each: phase 1 covers the preparatory work in order to make an informed decision about a potential nuclear power programme; phase 2 covers the development of the infrastructure issues required to be ready to begin and supervise construction of a nuclear power plant; phase 3 covers the construction of the plant up to the approval to commission and operate.

This publication is intended to complement the information presented in the Milestones publication by providing an approach for evaluating the status of a Member State against each of the infrastructure issues. It is therefore essential that people involved in developing the infrastructure read and fully assimilate the guidance of the Milestones publication before considering this evaluation approach.

In the areas of safety and security, the framework for an evaluation of infrastructure development is well established and based on the fulfilment of Member State obligations to international safety and security conventions and codes of practice, and the application of the IAEA safety standards. Therefore, they are not elaborated further in this publication.

This publication assumes that a project to construct a nuclear power plant, including determining whether nuclear power should be part of the national energy strategy, is being undertaken by a single Member State. However, it is recognized that some Member States may wish to undertake such a project jointly with one or more Member States. The same issues need to be addressed, but there is clearly scope for sharing some infrastructure issues. Another IAEA publication [2] specifically discusses this option and gives detailed guidance on sharing infrastructure.

This publication deliberately addresses evaluation of the two early phases of the project (upto the point of declaring that construction of the first nuclear power plant is ready to begin) for three key reasons:

— It is important in any major programme to invest wisely and effectively during the early preparatory stages;
— Several Member States are in these early phases of development and guidance is needed;

— Existing IAEA assessment tools and methodologies already provide some methodologies for assessing the status of a number of the infrastructure issues during phase 3 and beyond, i.e. construction and operation of a nuclear power plant.

Achievement of milestone 1 at the end of phase 1 shows that the Member State has adequately understood the requirements for implementing a safe and successful nuclear power programme and has properly planned and resourced the phase 2 activities. Achievement of milestone 2 at the end of phase 2 shows that the Member State is ready to start construction and supervision of the first nuclear power plant.

It is necessary to review progress across all 19 infrastructure issues because each one is essential and because there are significant interactions between them. The management of each infrastructure issue and the human and financial resources required to support them need to be fully integrated. It is for this reason that the evaluation approach described in this report addresses all 19 issues. Some of these issues, particularly related to safety, security and safeguards, already have detailed assessment methodologies developed by the IAEA. These principally address activities in phase 3, but can be adapted to review the status of activities in earlier phases. Where appropriate, this publication references those methodologies.

The aim for any Member State wishing to use this publication is to ensure that all 19 issues are reviewed in depth and the results brought together to provide an integrated view of progress, thereby allowing the country to decide on its readiness to move to the next phase.

The basis for the evaluation approach provided in this report comes from the experience and good practices of Member States with developed nuclear power programmes, together with the work undertaken in developing international standards. It is possible that there will be additional items arising from country specific requirements that need to be addressed.

Undertaking a nuclear power programme is a major commitment requiring strict attention to nuclear and radiation safety and the control of nuclear material. This commitment is a responsibility not only to the citizens of the Member State developing such a programme, but also to the international community.

The fundamental safety objective is to protect people and the environment from the harmful effects of ionizing radiation. A comprehensive safety framework needs to be developed that permeates all development activities. Recommendations for the development of this framework are provided in the IAEA publication Fundamental Safety Principles [3], which contains ten safety principles that represent the international consensus on the high level of safety required for the sustainable use of nuclear power. The first principle establishes that the prime responsibility for safety must rest with the operating organization. It is incumbent on the leadership and management of the Member State and the operator of the nuclear power plant to develop an awareness of safety issues and the encouragement and enforcement of a safety culture throughout the entire programme. It cannot be overemphasized that everyone involved in such a project carries a responsibility for safety.

In addition to nuclear and radiation safety, and no less significant, are the issues associated with the control of nuclear material, either to ensure the security of the material, or to ensure that all of the activities in a Member State can be demonstrated to ensure that there is no risk of proliferation of nuclear weapons and that all of the materials are adequately accounted for and protected. This also requires the development of a culture, system and practices that ensure that all staff understands their responsibilities and the importance of their actions.

1.2. OBJECTIVES

This publication provides a holistic approach to evaluate progress in the development of a nuclear power infrastructure based on the guidance contained in the Milestones publication [1]. It can be used either by a Member State wishing to evaluate its own progress (self-evaluation) or as a basis for an external evaluation (international peer review), where the Member State wishes to invite others to carry out an evaluation of its progress. The aim of the evaluation approach is to:

— Evaluate all relevant infrastructure issues in a consistent manner;
— Bring the results together in order to identify a comprehensive action plan for moving into a subsequent phase of the establishment of a nuclear power infrastructure;

— Provide a consistent international approach;
— Enhance national competence through participation in a detailed and comprehensive evaluation.

1.3. SCOPE

The scope of this publication includes evaluation of both the 'hard' (grid, facilities, etc.) and 'soft' (legal, regulatory, training, etc.) infrastructure issues needed for a nuclear power programme. Each of these issues is discussed in the Milestones publication, and a means of evaluating the status of each of the 19 infrastructure issues is provided for both phase 1 and phase 2 in the development of a nuclear power programme. The results of the evaluation include the evidence to demonstrate that:

— All of the work required in the phase leading up to the milestone has been adequately completed;
— The plans for the following phase are comprehensive and realistic.

Operation, decommissioning, spent fuel and waste management are addressed by this publication to the degree necessary prior to commissioning of the nuclear power plant. This publication takes the view that all of the issues, including operation and decommissioning as well as spent fuel and waste management, are considered and the planning is in progress by the time the bid request is issued.

The framework for the evaluation of safety and security is based on fulfilment of Member State obligations to international safety and security conventions and codes of practice and the application of the IAEA safety standards. A suite of safety and security services is available to Member States upon request to review results of national self-assessments and to advise on work needed. Therefore, they are not elaborated further in this publication.

1.4. USERS

The primary users of this publication are the decision makers, advisers and senior managers in the governmental organizations, utilities, industries and regulatory bodies of a Member State interested in developing nuclear power. Other organizations such as donors, suppliers, nuclear energy agencies and operator organizations may also use this publication or the results of its use to provide confidence that the Member State is adequately developing the infrastructure necessary to regulate, construct and safely operate a nuclear power plant or to identify areas for potential assistance.

1.5. STRUCTURE

This publication consists of two main sections in addition to this introduction. Section 2 summarizes the programme phases and milestones associated with a nuclear power programme. It also describes the steps of the evaluation approach. Section 3 provides the detailed bases for evaluation of each issue for each of the phases 1 and 2. The appendix provides some illustrative forms for recording the results of the review.

1.6. HOW TO USE

This publication should be used as information to a Member State on how to evaluate the progress of its infrastructure development to establish a nuclear power programme, and hence its readiness to move to the next phase, and any actions required to do so. Neither this publication nor the Milestones publication are intended to provide a comprehensive description of how to create the entire infrastructure needed for a nuclear power programme. A wealth of information and guidance on each of the infrastructure issues is available, for example, from the IAEA publications listed in the bibliography included in the Milestones publication.

2. INTEGRATED INFRASTRUCTURE EVALUATION

2.1. DEVELOPMENT OF THE NATIONAL INFRASTRUCTURE

The Milestones publication provided an overview of the entire programme to develop the national infrastructure for nuclear power. Figure 1, explained in detail and taken from this publication, shows the various phases of such a programme.

The activities are split into three progressive phases of development. The completion of the work at each of these phases is marked by a specific milestone at which the progress and success of the development effort can be evaluated and a decision made to move on to the next phase. For reaching each milestone, 19 issues that need to be considered are shown schematically in Table 1 (from Milestones [1]). A description of the conditions that would be expected to be achieved by the end of each phase was also provided in the Milestones publication. These conditions were used to prescribe the basis of the evaluation proposed in this publication.

As noted earlier, the existing IAEA assessment tools and techniques are mostly aimed at phase 3 and beyond. Hence, the key focus of this publication is on evaluating phases 1 and 2. However, even for phase 2, some of the IAEA existing tools can be used to evaluate the readiness of a Member State to proceed. It must be clearly recognized that evaluations of phases 1 and 2 are not an alternative to any of the detailed IAEA assessment tools available for phase 3 and beyond, but rather an early evaluation of whether the infrastructure programme is developing appropriately.

TABLE 1. INFRASTRUCTURE ISSUES AND MILESTONES

Issues	Milestone 1	Milestone 2	Milestone 3
National position			
Nuclear safety			
Management			
Funding and financing	CONDITIONS	CONDITIONS	CONDITIONS
Legislative framework			
Safeguards			
Regulatory framework			
Radiation protection			
Electrical grid			
Human resources development			
Stakeholder involvement			
Site and supporting facilities			
Environmental protection			
Emergency planning			
Security and physical protection			
Nuclear fuel cycle			
Radioactive waste			
Industrial involvement			
Procurement			

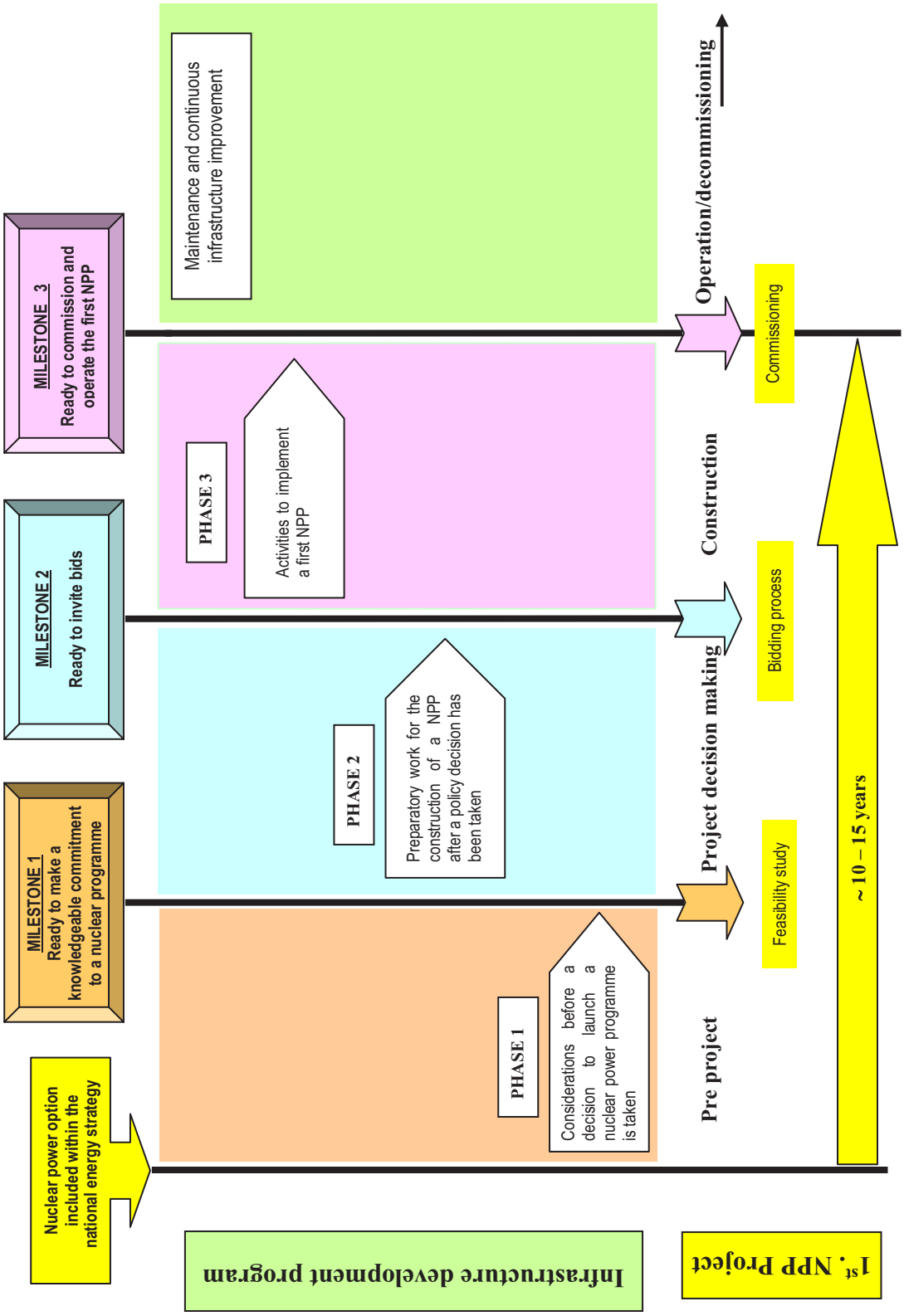

FIG. 1. Infrastructure development programme.

In general, the evaluation of phase 1 involves the examination of the proposed work programme for phase 2 and beyond in order to establish if the issues have been fully understood, researched and resourced. However, it is also important to review already existing infrastructure and operations. For example, countries contemplating a nuclear power programme may already have an operational, legal and regulatory system for the safe use and transport of radioactive material and may have a research reactor in operation. One of the inputs to the overall evaluation proposed in this publication is the result of national and international evaluations of existing activities.

It is necessary to understand the purpose of the evaluation of each phase. For phase 1, the evaluation concerns the quality of information available and the effective investment of resources for informed decisions and the management of programme risk. While a Member State can do less work in phase 1, there is a much greater risk of an ill informed decision, or of phase 2 taking much longer than planned because the necessary issues have not been properly researched. The guidance in this publication takes into account the wide international experience of how best to control these project risks.

Clearly, the introduction of a nuclear power programme into a Member State will involve the use of available international experience. The use of partnership agreements with vendors and/or countries with the experience of nuclear power operations and the use of recognized experts as consultants are obviously encouraged. However, any evaluation of readiness to proceed to a further phase will need to make sure that a Member State wishing to implement a nuclear power programme has full ownership and understanding of the key issues involved.

2.2. THE MILESTONES FRAMEWORK

2.2.1. Milestone 1

During milestone 1 the Member State will be in a position to make an informed decision on whether it is appropriate to introduce a nuclear power programme. In order to achieve this milestone, the Member State will not only have assessed that it needs additional energy and included nuclear power as a possible option to meet some of these needs, but will also have carried out the first phase of the programme, which involves the considerations and planning that occur before a firm decision is made to develop a nuclear power programme.

During this phase, the responsible organization is the government's nuclear energy programme implementing organization (NEPIO).[1] The NEPIO should be appropriately staffed and resourced and include adequate expertise and experience.

In the context of its national and socioeconomic development, the NEPIO should develop a clear understanding of the Member State's energy needs and the potential role, appropriateness and viability of nuclear power in its long term energy plan. Its report at the end of phase 1 should clearly show an understanding of the infrastructure that needs to be developed and demonstrate viable plans for its introduction, identifying resource requirements and timescales. It should include plans for the development of organizations to undertake the role of regulator, owner, operator and technical support. It is also essential that the plans address the development of an appropriate management system and a safety culture in each organization, and that these organizations recognize their responsibilities for ongoing safe operation.

Preliminary discussions with potential nuclear programme vendors should be conducted to ascertain their interest in, and possible concerns or limitations for, participating in the development of a nuclear power programme.

2.2.2. Milestone 2

At milestone 2, the Member State will have the necessary infrastructure to invite formal bids for the first nuclear power plant and to supervise its construction. Following the policy decision to proceed with the

[1] This is a governmental multi-disciplinary group charged with the initial investigation and promotion of a nuclear power programme.

development of a nuclear power programme, substantive work for achieving the necessary level of technical and institutional competence will have been undertaken and the necessary legal framework will be in place.

An effectively independent regulatory body will have been developed to a level at which it can fulfil all of its oversight duties.

The owner/operator (or utility) will need to have developed the competence to manage a nuclear power plant project and to achieve the level of organizational and operational culture necessary to meet regulatory requirements. Additionally, it will have the ability to demonstrate that it is an adequately informed and effective customer.

2.2.3. Milestone 3

Although this publication does not cover the evaluation of the achievement of milestone 3, a brief description is included in order to provide a complete overview. At this point, the Member State will be in a position to commission and operate the first nuclear power plant. The owner/operator will have developed from an organization capable of ordering a nuclear plant to an organization capable of accepting the responsibility for commissioning and operating one. This will require significant recruitment, development and training for all levels of staff and the demonstration that the owner/operator can manage the project throughout its life. While achieving milestone 3 is a major accomplishment, it should be remembered that it is only the beginning of a lasting commitment to the safe, secure and effective application of nuclear power.

2.3. EVALUATION APPROACH

2.3.1. Overview

Self-evaluation is encouraged as the first step in any overall review of readiness to proceed to the next phase of the development of a nuclear infrastructure. Self-evaluation is an essential tool for any learning organization. Although a self-evaluation will be managed by the Member State and will include staff members who are part of the organizations involved, consideration should be given to augmenting the team by the use of expert consultants from within the Member State or possibly from another Member State. The key requirement for any evaluation is to assign people who have a good understanding of the infrastructure issues, and have knowledge and experience in conducting evaluation activities. It is also important that the evaluation team have a level of 'independence' from those who have been involved in the development of the project.

Following such a self-evaluation, Member States are encouraged to arrange an independent review of their evaluation. Such an activity will need to be planned well in advance of its expected date.

Confidence to move beyond phase 3 will be enhanced by the use of existing independent reviews such as the IAEA Independent Regulatory Review Service (IRRS)[2] or Operational Safety Review Team (OSART)[3] and/or a World Association of Nuclear Operators (WANO) peer review, though it needs to be recognized that these only cover some of the 19 infrastructure issues. It is very important that at this time a Member State become a contracting party to the Convention on Nuclear Safety.

2.3.2. Evaluation steps

The Member State must determine the scope of the evaluation. However, it is strongly recommended that all 19 infrastructure issues are covered in order to obtain a complete picture of progress. A complete evaluation comprises four main steps:

[2] An IAEA peer review service aimed at providing advice and assistance to Member States on strengthening and enhancing the effectiveness of Member State regulatory infrastructures, including effective independent regulatory bodies.

[3] The purpose of OSART is to assist Member States in enhancing the operational safety of nuclear power plants and to promote the continuous development of operational safety within all Member States by in-depth reviews of plant operational safety performance and by the dissemination of information on good practices.

(1) Identifying the terms of reference for the evaluation, the organizations to be involved and the individuals who will conduct the evaluation;
(2) Evaluating the status of development of the infrastructure against the basis listed in Section 3 of this publication;
(3) Identifying areas needing further attention;
(4) Preparing an action plan to address these areas.

It is recommended that all of these steps be undertaken to obtain a comprehensive and accurate picture of whether the Member State has completed its work across all of the issues for a particular milestone and carry out any outstanding work.

The basis of the evaluation is listed in Section 3 for each condition for each infrastructure issue. When all of the information has been collected for each infrastructure issue, it should be analysed to determine areas where further work is required and to formulate suggestions for improvement.

2.3.3. Documenting results and formulating an action plan

An evaluation report should be prepared and should contain, at a minimum, the following elements:

— Identification of the 'team of evaluators' by position/role;
— Identification of the 'team of respondents';
— A description of the process used to conduct the evaluation;
— Lists of the evidence reviewed and further actions required;
— Summary conclusions giving the state of achievement of each condition;
— References to any relevant material used for conducting the evaluation;
— Confidentiality requirements, if any.

A tabular format is proposed to collate and summarize the results of the evaluations carried out and example forms are provided in the appendix. The documents reviewed, and hence the basis for the observations, are noted. An observations column is used to identify whether the information identified is sufficient or whether further actions are required.

In order to assess overall progress and to assign priorities, each condition is given a 'status'. Three possibilities are used:

— Significant actions needed;
— Minor actions needed;
— No actions needed.

A summary report should pull integrate all of these requirements. A suggested form is provided in the appendix.

Upon completion of the report, an action plan should be developed. The observations from the evaluation report should be used by the Member State to determine the action plan. Each Member State should decide the most appropriate way of preparing the action plan, but it should include:

— The issue being addressed;
— A clear statement of the action or actions showing how they will address the identified shortfall;
— An agreed completion time;
— The organization/function/post holder responsible for the completion of the actions.

It is important that the actions are 'owned' by the organization responsible for their completion and that they accept and have the resources to complete the actions within the agreed timescale. A suggested form for the action plan is included in the appendix.

At the request of a Member State, the IAEA can organize and deliver a self-evaluation workshop, covering the approach described in this publication, as well as practical examples of its application.

3. BASIS FOR EVALUATION

3.1. OVERVIEW

The detailed information that provides the evidence that a particular condition has been met is presented in this section in the form of a table for each of the 19 infrastructure issues. Several of the issues apply to any major project and need to be evaluated in a manner similar to any other project. However, there are additional 'nuclear' project features, and these are identified under the appropriate issue. The tables often refer to 'evidence' and 'plans'.

Evidence can include reports, meeting notes, correspondence, talks and presentations, conferences attended with meeting reports, discussions, curriculum vitae, organization descriptions, job descriptions, etc.

Plans need to have clear actions with associated timescales, resources required and evidence that they are available. In all cases, there should be evidence that the documents have been approved by a person/organization with the appropriate authority.

There are, of course, a number of ways that a nuclear power plant project can be established and managed, e.g. own country lead contractor; turnkey; build, own and operate (BOO),[4] and build, own, operate and transfer (BOOT).[5] This publication does not seek to prescribe a particular approach since any one of them can be applied as the actual requirements do not change. What may change in some cases is the means by which the conditions are fulfilled, and this is recognized in the detail of the proposed basis.

In addition to the detailed information provided in Sections 3.2 and 3.3, there are some general points that can be made. Some issues make explicit reference to understanding and using the experience from other countries operating nuclear power plants. This is not repeated for every issue, but it is clearly important for all issues that the country makes extensive use of the available international experience.

For each issue, there should be a clear work programme for the next phase of the project which states:

— The objectives of the work programme;
— The detailed activities;
— The organization (person) responsible for each activity;
— The funding and resources (human, financial, etc.) required;
— How it will be provided;
— The timescales for each activity.

Emerging from the detailed evaluations, what is required is objective evidence of a holistic approach to information gathering, resource development and decision making. It is, for example, not useful to have a small team fully aware of the nuclear and radiation safety requirements if there is no plan to develop a competent operating organization with a strong safety culture or a plan to ensure the capability of producing components with an assurance of the required integrity or reliability. The evidence can be obtained by looking at each of the 19 issues and then drawing the detailed evaluation together. For example, if milestone 1 has been reached, it should be clear that:

— The Member State has the knowledge that is required;
— Sufficient resources have been devoted and attention by senior officers has been given to the analysis;
— The overall strategy and objectives are sound;
— Programme risk is adequately managed;
— The plans for work and resources required for phase 2 are sound;
— The existing activities associated with radiation sources are adequately managed, controlled and regulated, and that the capability has been independently evaluated;

[4] A contract for the supply of services, where the supplier remains the owner and operator of the facility.

[5] A contract for the supply of services, where the supplier is initially the owner and operator of the facility but the contract includes arrangements for the transfer of ownership and operating capability to the host country.

— There is firm government commitment to the programme;
— A strong project management team is in place with clearly defined authority, funding and resources.

3.2 EVALUATION OF INFRASTRUCTURE STATUS IN PHASE 1

1. National position	Phase 1
Conditions	Basis for evaluation
1.1. Safety, security and non-proliferation needs recognized	• Official documentation clearly demonstrating the Government's commitment to the safe, secure and peaceful implementation of nuclear power for the long term.
1.2. NEPIO established and staffed	• Charter showing that the NEPIO has been established by, and reports to, a senior government minister. • Evidence that the roles and responsibilities defined in the charter are known by other government ministries and key members of the NEPIO. • The NEPIO charter clearly charges and authorizes the preparation of a comprehensive report to identify the commitments and conditions necessary to establish a nuclear power programme. It defines an adequate scope of investigations and clear definition of objectives and timescales. It identifies how its mandate and activities fit within the overall plan for implementing the nuclear power option. • A clear description of how the NEPIO operates in terms of funding, office accommodation and equipment, and reference material. • Evidence showing adequate interactions between and support from appropriate ministers such as those responsible for energy, environment, etc. • A documented budget planning and reporting process showing that appropriate funding is being provided to and is being expended by the NEPIO to fulfil its charter in the scheduled time. • Organization chart; job descriptions and curriculum vitae of members demonstrating appropriate skills, qualifications and experience to address all of the infrastructure issues, based on requirements in IAEA-TECDOC-1513 [4]. This includes appropriate use of consultants and the demonstration that the organization is an 'intelligent customer'.[a]
1.3. National strategy defined (see also Issue 3 — Management, which is closely linked to national position)	• Comprehensive report produced by the NEPIO covering all areas identified in the Milestones publication [1] and recognizing the resources and timescales required for the activities required for phase 2. A demonstration that the Member State can provide the overall resources required integrated across all areas. (Detailed requirements for the contents of the comprehensive report are identified under each of the following issues.) • Executive summary of comprehensive report based on detailed report, containing estimates of total resources and timescales, and evidence that it has been properly reviewed by senior government officials.

[a] The capability of the organization to have a clear understanding and knowledge of the product or service being supplied.

2. Nuclear safety[a]	Phase 1
Conditions	Basis for evaluation
2.1. Key elements of nuclear safety understood.	• Evidence that the NEPIO has an understanding of and commitment to the safety objectives and principles described in the IAEA Fundamental Safety Principles [3] and the safety standards. • Evidence that international safety standards and nuclear safety good practices are known by NEPIO members. • Evidence that INSAG publications from the International Nuclear Safety Group (INSAG) have been reviewed and key issues identified. • Recruitment and training plans showing commitment to ensure appointment of leaders with appropriate training and experience for leadership and the management of safety. • Recognition of and commitment to the costs of training programmes to develop an appropriate safety culture in each of the relevant organizations to be established. • Recognition of and commitment to the costs of training programmes to ensure safety principles are promulgated within organizations to be established. • Evidence that the ultimate responsibility of the operator is recognized. • Recognition of and commitment to the establishment of a regulatory system with a clear legal function for nuclear safety.
2.2. Need for intergovernmental instruments on safety recognized.	• Government statement on acceptance of the Global Nuclear Safety Regime [5] resulting from a commitment to a nuclear power programme.
2.3. Support through international cooperation intended.	• Commitment to join the Convention on Nuclear Safety and to actively participate in the peer review process. • Evidence of review of options for bilateral or regional cooperation and specific actions for the selected cooperation initiated. • Implementation of a national technical cooperation programme with the IAEA and evidence of government financial support. • Specific plans for cooperation with other international organizations (WANO, nuclear regulators, universities, etc.).

[a] Note that safety considerations need to include adequate consideration of security needs and vice versa.

3. Management	Phase 1
Conditions	Basis for evaluation
3.1. Energy strategy and nuclear power compatibility analysed.	• A government report justifying the role of nuclear power in the future energy strategy of the Member State.
3.2. Unique Member State conditions evaluated.	• A report produced by the NEPIO describing national criteria and general specifications for a nuclear power plant to be implemented in the Member State.
3.3. Available nuclear technologies identified.	• A report produced by the NEPIO based on analysis of information, including that provided by potential vendors showing that there are nuclear power plant designs available that fulfil national criteria.
3.4. Ownership options and operational responsibilities considered.	• A plan produced by the NEPIO analysing possible ownership and organizational structures for financing, implementation and operation of the nuclear power plant and demonstrating capability for safe and successful implementation of a nuclear power programme.
3.5. Authorities and responsibilities established.	• A government report describing the authorities and responsibilities of future organizations.
3.6. Appropriate expertise and experience involved.	• Evidence that external advisors and consultants with appropriate experience have participated in the preparation and/or review of relevant documents.
3.7. Commitment evident to management systems that promote and support a strong safety culture.	• A plan produced by the NEPIO to ensure that the management systems in future key organizations are designed in such a way that they provide structure and direction to the organization that permits and promotes the development of leadership and a strong safety culture.

4. Funding and Financing	Phase 1
Conditions	Basis for evaluation
4.1. Adequate funding for the NEPIO provided.	• Clear evidence (such as a documented budget of finances and resources with evidence of actual expenditure) that enough resources have been made available to the NEPIO to carry out an adequate review.
4.2. Strategies for funding and financing established.	• An analysis deriving the funding requirements, as a function of time, for each of the following elements: (a) Initial infrastructure; (b) Sociopolitical acceptance; (c) Creation or hiring of expertise; (d) Creation and continuation of a competent regulatory body; (e) Creation of expertise for competent project management and operating staff; (f) Security arrangements; (g) Safeguards arrangements; (h) Management of radioactive waste(including long term storage); (i) Nuclear power plant decommissioning. It is important that all the required skills and the level of competency required are matched to the requirements identified under issue 10. Human Resource Development. At this stage there will be significant uncertainties, so maximum and minimum values should be evaluated. • An evaluation of financing options and economic viability taking account of government and owner/operator capabilities and credit worthiness. Options may include: (a) Total financing and ownership by the government; (b) Export financing; (c) Local financing; (d) Complete private funding. • An analysis of financial risks and strategies to manage the risks. • Evidence of understanding of financial implications of national and international legal frameworks.

5. Legislative Framework	Phase 1
Conditions	Basis for evaluation
5.1. Adherence to all relevant international legal instruments planned.	• A plan approved by the government identifying the relevant international legal instruments to which the State will become party. The plan should include: the timescale for adherence and the actions, timescales and resources required to implement the instruments. At a minimum, the following instruments should be covered: (a) Convention on Early Notification of a Nuclear Accident; (b) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency; (c) Convention on Nuclear Safety; (d) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste management; (e) Convention of Physical Protection of Nuclear Materials and its Amendment; (f) Vienna Convention on Civil Liability for Nuclear Damage, the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage; (g) Comprehensive Safeguards Agreement between the State and the IAEA;[a] (h) Revised Supplementary Agreement concerning the provision of Technical Assistance by the IAEA.

[a] The IAEA encourages Member States to consider concluding the Additional Protocol.

5. Legislative Framework	Phase 1
Conditions	Basis for evaluation
5.2. Plans for national nuclear legislation to be enacted.	• A plan approved by the government for completion of the national nuclear legislation. The plan should include: the timescale for approval and the actions, timescales and resources required to enact the planned legislation. The plan should cover: (a) Establishing an effectively independent regulatory body; (b) Establishing an authorization system, responsibilities of the operator, inspection and enforcement; (c) Formulating principles and requirements for each subject area (e.g. radiation protection, radiation sources, nuclear installations, radioactive waste management and spent fuel, decommissioning, mining and milling, emergency preparedness, transport of radioactive material); (d) Establishing compensation mechanisms for nuclear damage; (e) Implementing IAEA safeguards; (f) Implementing import and export controls of nuclear material and items; (g) Formulating security principles, including physical protection of nuclear material and facilities. • A plan identifying other laws to be prepared or amended. The plan should include: the timescale for approval and the actions, timescales and resources required to enact amended legislation. The plan should also cover: (a) Environmental protection (air and water quality and wildlife protection); (b) Emergency preparedness and management; (c) Occupational health and safety of workers; (d) Protection of intellectual property; (e) Local land use controls; (f) Foreign investment; (g) Taxation; (h) Roles of national government, local government, stakeholders and the public; (i) Financial guarantees. Further details are available in the IAEA Handbook on Nuclear Law [13].
5.3. Consultation planned with national stakeholders about the legislative framework.	• Documented evidence that relevant stakeholders have been identified and consulted, and the resulting comments have been satisfied or actioned.

6. Safeguards	Phase 1
Conditions	Basis for evaluation
6.1. Obligations under NPT and non-proliferation treaties and other international instruments, recognized.	• Evidence that obligations under all relevant treaties and relevant international instruments are recognized and understood; • A plan produced by the NEPIO covering the conclusion of the Treaty on the Non—Proliferation of Nuclear Weapons and additional non-proliferation treaties, as applicable; • Evidence that approaches undertaken by one or more countries with existing nuclear power programmes have been reviewed and information learned has been translated into the national context.
6.2. Development, implementation and enforcement of safeguards framework, including SSAC establishment, planned.	• A plan produced by the NEPIO covering the conclusion of a CSA (comprehensive safeguards agreement) with the IAEA and the establishment of an SSAC (State system of accounting for and control of nuclear material) with requisite authorities. • A plan produced by the NEPIO covering the drafting, implementation and enforcement of national legislation, policies and procedures relevant to safeguards.
6.3. International requirements for any existing nuclear facilities or locations outside facilities met.	• If any nuclear facilities or locations outside facilities already exist (e.g. locations associated with nuclear fuel research), evidence that all safeguards obligations are being met. Where applicable, evidence that the commitments from any resulting action plan are being met.

7. Regulatory Framework	Phase 1
Conditions	Basis for evaluation
7.1. Development of an adequate regulatory framework planned.	• Clear plans to develop necessary activities such as those described in the IAEA Safety Standards publication GS-R-1 [6]. This will include: (a) Establishment of authorization process; (b) Development of regulations and guides; (c) Safety review and assessments; (d) Inspection; (e) Enforcement; (f) Coordination with other national and international bodies; (g) Public information; (h) Provision of adequate supporting technical resources. • Evidence that the functions of the proposed regulatory body will be developed, with assistance and advice from those whose expertise is well established and recognized. This could include independent consultants, support organizations or international organizations.

8. Radiation protection	Phase 1
Conditions	Basis for evaluation
8.1. Hazards presented by nuclear power plant operation recognized.	• Analysis covering: (a) The additional hazards resulting from expanding activities to include power reactor operation, fuel transport, waste management and storage and decommissioning; (b) The requirements of the IAEA Safety Standards for these additional hazards; (c) The impact on the existing regulations and practises. • Evidence of interactions by specialists with countries operating nuclear power.
8.2. Enhancements to national regulations and infrastructures planned.	• Plan to implement a larger radiation protection programme, including the testing, commissioning, operation, shutdown and decommissioning stages of a nuclear power programme. • Plan to meet the intent of IAEA Safety Standards Series GS-R-1 [6] and the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (Safety Series No. 115) [7]. • Clear understanding of the organizational issues that need to be addressed; clarity whether the existing regulatory body will be expanded or a new body created, and an implementation plan. • Clear and adequate plans for the development of appropriate skills and experience.

9. Electrical Grid	Phase 1
Conditions	**Basis for evaluation**
9.1. Electrical grid requirements considered.	• A complete analysis of the inclusion of a nuclear power plant into the existing and future electrical grid. The analysis should include: (a) The existing grid capacity and the expected growth by the date of the planned nuclear power plant start up; (b) The historical stability and reliability of the electrical grid and its adequacy to support safe and reliable operation nuclear power plant. (c) The historical and projected peak and trough hours and the corresponding energy demand; (d) Consideration of available nuclear power plant designs to identify those with output consistent with required grid performance and reliability, taking into account: (i) The feasibility of operating the future nuclear power plants as a base plant (100% or near 100% power); (ii) The percentage represented by the capacity of the nuclear power plant in relation to the total capacity of the grid. • Potential location of the nuclear power plant and its behaviour with regard to: (i)'Radial or star' shape grid; (ii)'Ring' shape grid; (iii) Assessment of the risk posed by the potential isolation of the nuclear power plant in the case of a star shape grid or a not fully closed ring shape grid if the nuclear power plant is located at the extreme end of a grid branch. • The potential for local or regional interconnections to improve the grid characteristics, such as reliability. Where improvements are identified, the feasibility of funding should be considered. • The number of plants in the grid (or connected to the off-site startup line) with 'black startup capability', in the case of a regional blackout during the nuclear power plant operation. A large number of 'black startup capability' plants improves the possibility of a fast restoration of the off-site energy to the nuclear power plant. • Adequate measuring, monitoring and communications to be covered between the national and regional grid controllers and the future nuclear power plant. • The need for a truly independent 'startup line'.

10. Human resources	Phase 1
Conditions	Basis for evaluation
10.1. Necessary knowledge and skills identified.	• Analysis identifying the competences needed by each of the future organizations. The analysis should be sufficiently detailed to allow the full implications to be assessed and to support a detailed plan for phase 2 (see below). • Evidence that key stakeholder organizations have participated in the development and review of the above analysis.
10.2. Develop and maintenance of human resource base planned.	• A human resource (HR) development plan that identifies the human resources needed by each of the future organizations. There should be a detailed implementation plan for phase 2 which should also address the key requirements of a complete nuclear power programme. The details for phase 3 can be developed during phase 2. The plan should address: (a) Bulk manpower needs per phase; (b) Breakdown by knowledge, skills and discipline per phase; (c) Flow of manpower to other projects (e.g. future nuclear power plants); (d) The human resources that are available in key stakeholder organizations; (e) The human resources that are expected to be recruited/developed nationally; (f) The external human resources that are needed to augment national resources and how they will be secured; (g) The development and training of national competence (through schools, universities, institutes, industry); (h) The need for support from a vendor country and any specific training programmes with vendors; (i) How trained staff will be retained, addressing both the competition from other markets/organizations and the impact of project delays. • Evidence that key stakeholder organizations have participated in the development and review of the above plan. • Strategies for developing an appropriate safety culture and management in each of the future organizations. • Proposals for qualification and certification of key staff.

11. Stakeholder involvement	Phase 1
Conditions	Basis for evaluation
11.1. Strong public information and education programme initiated.	• Programmes to determine the degree of knowledge and receptiveness to the local use of nuclear power; • Public information programme and tools to clearly explain the reasons for the government interest in and the societal benefit resulting from the use of nuclear power; • A plan for interaction with the public, opinion leaders and other stakeholders, including neighbouring countries.
11.2. Need for open and timely interaction and communication regarding the nuclear power programme addressed.	• Training programme to enable available senior spokespersons to interact with stakeholders; • Evidence of meetings held with key stakeholder groups and a plan of follow up actions and meetings; • A plan for appropriate public participation to ensure public acceptance of decisions made.

12. Site and supporting facilities	Phase 1
Conditions	Basis for evaluation
12.1. General survey of potential sites, conducted.	• Report issued and approved identifying: (a) Requirements for nuclear power plant site evaluation; (b) Rgional analysis and identification of potential sites; (c) Screening of potential sites and selection of candidate sites; (d) Comparison of candidate sites. • The requirements and screening criteria ensure adequate protection of the public and the environment from the effects of ionizing radiation and other factors arising from nuclear installations and are consistent with the requirements IAEA Safety Standards Series No. NS-R-3 [8]. • Evidence that the NEPIO consultants used for nuclear power plant site selection are competent and have experience in this area.
12.2. Selected site(s) justified.	• Nuclear power plant site selection report approved by the NEPIO, clearly demonstrating: (a) All of the candidate sites identified during the site survey have been evaluated in order to select the site(s) for the nuclear power plant; (b) The selected site(s) are acceptable from all aspects and, in particular, from the nuclear safety point of view; (c) Tthe noise and visual effects during the construction and operation of the future plant have been considered; (d) The selected site(s) do not disturb or limit the access to important archaeological objectives and do not modify the landscape unacceptably; (e) The selected site(s) do not affect individuals or communities, the government and local or regional organizations; • The nuclear power site selection report contains plans for additional studies and site investigations that will need to be performed during phase 2 in order to complete and refine the assessment of plant site characteristics.

13. Environmental protection	Phase 1
Conditions	Basis for evaluation
13.1. Unique environmental issues recognized	• Identification by the NEPIO of the proposed responsibilities of the regulatory body and environmental agencies on licensing, environmental impact assessments (specific to radiation) and environmental monitoring (both initial background and later operational) around nuclear facilities; • Procedures for the elaboration and reporting of the environmental impact assessments for nuclear and other related facilities, including assessment of their overall and radiological impacts; • Evidence of interactions by specialists with countries operating nuclear power plants; • Evidence that the requirements of the IAEA Safety Standards for the control of radioactive discharges during normal operation are clearly understood by the NEPIO; • Evidence that the other key environmental issues: water use, transporting materials, disposal of hazardous waste, additional environmental monitoring requirements, construction impact, etc., are clearly recognized by the NEPIO; • National report on positive environmental outcomes expected from the nuclear power programme; • Communication strategy to stakeholders at different levels, including the general public. (This is also addressed under issue 11, Stakeholder Involvement).
13.2. Environmental impact assessment production and communication recognized.	• Identification of the organization charged with the elaboration of the environmental impact assessment report for the selected site and nuclear facility, including the pre-operational environmental monitoring programme; • Research programmes to identify the environmental radiological sensitivities; • Document on specific safety requirements to be complied with for the siting, design or construction stages to satisfy nuclear law and take account of environmental legislation; • Communication team established and ready to provide information on environmental issues to the stakeholders and the local population and to organize discussions.
13.3. An effective environmental framework for existing uses of radiation sources in place.	• Report of an audit/review of the existing framework against international conventions and requirements with a resulting action plan which is being met.

14. Emergency planning	Phase 1
Conditions	Basis for evaluation
14.1. Appreciation of the need for emergency planning, developed.	• Clear definition of roles and responsibilities of all organizations to be involved as part of a national emergency preparedness and response plan. • Evidence of interactions with specialists from countries operating nuclear power plants. • Evidence that the requirements of the Early Notification and Assistance Conventions are understood and a plan to implement the requirements is in place. • Recognition of the facilities and equipment that will be required for emergency response. • Plan to develop emergency response capability, identifying any actions which need to be completed during phase 2. The process of developing emergency response capability [9] must be completed by milestone 3.
14.2. Communication with and involvement of local and national government taken into account.	• Plans to include national and local authorities in the development of emergency plans; • Review of the adequacy of existing facilities used by local and national authorities.
14.3. Emergency planning for existing radiation facilities and practices in place	• Report of an audit/review of the existing systems against international requirements such as those in IAEA Safety Standards Series No.GS-R-2 [11] and GS-G-2.1 [12] with a resulting action plan which is being met. Such a review should be performed through an IAEA Emergency Preparedness Review (EPREV)[a] mission.

[a]The purpose of EPREV is to appraise Member State's readiness to deal with nuclear or radiological emergencies. The assessment of the national capabilities is made against the international requirements regarding preparedness for and response to nuclear or radiological emergencies [11].

15. Security[a]	Phase 1
Conditions	Basis for evaluation
15.1. Requirements for security and physical protection acknowledged.	• Establishment of an committee forf nuclear security-related policy making, interagency coordination and planning activities associated with security and physical protection. Clear definition of its role, structure, responsibilities and reporting requirements. • Evidence of suitable qualifications and experience of the members. • A plan to implement a division/office responsible for the management of security and physical protection arrangements, including an organizational chart and a description of its function. • A plan to hire or contract with SQEP (suitably qualified and experienced personnel) experts and organizations to assist in security and vulnerability analysis as well as risk assessments of malicious acts to nuclear power plants, nuclear and other radioactive material and its transportation. • Government awareness of the risk of malicious acts and possible radiological, political, economical and social consequences. Evidence of intelligence service technical reports on the analysis of incidents occurring at nuclear facilities in the world. • Government awareness of international guidelines on security.[b] • Plan to train relevant staff including police and armed forces. • Programme to develop strong security culture during phase 2.
15.2. Necessary regulation identified.	• Plan to develop national legislation providing a basis for regulation of security and physical protection arrangements regarding nuclear facilities, nuclear and other radioactive material, its transportation and storage, including provisions for licensing, inspection, and sanctions. • Plan to develop a regulatory function in the area of security and physical protection, including physical protection requirements, information confidentiality, security staff recruitment, security culture and other components. • A set of requirements such as those in IAEA Nuclear Security Series. • A plan, including allocation of adequate resources, for the production of regulatory documents. • Clear identification of a head organization that will manage a national DBT (design basis threat) development. • A plan to collect documents, information, data from investigations and other source data on illegal, malicious, criminal and other acts, in order to carry out a risk assessment and modelling scenarios of illegal activities. • Evidence that external and other threats have been considered for the selected nuclear power plant sites in order to minimize the risk of malicious acts.
15.3. Effective security protection for existing uses of radiation sources in place	• Report of an audit/review of the existing protection against international requirements with a resulting action plan which is being met.

[a] Note that security considerations include physical protection and adequate consideration of safety needs and vice versa.
[b] See the publications in the IAEA Nuclear Security Series.

16. Nuclear fuel cycle	Phase 1
Conditions	Basis for evaluation
16.1. Knowledge of nuclear fuel cycle steps and approaches developed.	• A document clearly demonstrating that the NEPIO understands the long term nuclear fuel cycle commitments inherent in developing a nuclear power programme and has gathered the requisite knowledge for completing realistic nuclear fuel cycle plans during phase 2. The document should also identify available national natural resources and capacities for the fuel cycle and provide an assessment of available policy options for a national fuel cycle strategy and address non-proliferation issues. • A document clearly demonstrating that the NEPIO understands the possible regulatory requirements of fuel cycle facilities.
16.2. Need for site spent fuel storage recognized.	• A document clearly showing that the NEPIO has understood the importance of adequate capacity for on-site spent fuel storage, taking into account different fuel cycle options (i.e. open and closed fuel cycles).
16.3.Interim spent fuel storage considered.	• A document clearly indicating that the NEPIO is aware of the need to consider available options for longer term storage of spent fuel.

17. Radioactive waste	Phase 1
Conditions	Basis for evaluation
17.1. The burdens of radioactive waste from nuclear power plants recognized .	• A document clearly demonstrating that the NEPIO understands the significant implications and responsibilities related to high, intermediate and low level radioactive waste resulting from nuclear power generation. The document should address realistic understanding of needed national capabilities, regulatory framework, financing schemes, radioactive waste management infrastructure, radioactive waste arisings and options for relevant processing, handling, storage, and disposal technologies and facilities.
17.2. Current capabilities for waste processing, storage and disposal reviewed.	• A document clearly showing that the NEPIO has examined current capabilities for processing, storage and disposal of intermediate and low level radioactive waste and understands the options for addressing any shortfalls.
17.3. Options for ultimate disposal of high level radioactive waste recognized.	• A document clearly indicating that the NEPIO understands options for final disposal of high level radioactive waste.

18. Industrial Involvement [a]	Phase 1
Conditions	Basis for evaluation
18.1. National policy with respect to national and local industrial involvement considered.	• A policy for national industrial involvement based on the following: (a) A survey of industries with the potential to participate in the nuclear power programme for construction or support services for nuclear safety related activities and analyses their ability to satisfy the requirements of a nuclear power programme. (b) A survey of local suppliers with the potential to supply equipment or services supporting nuclear power plant construction, maintenance and/or operation including: (i) equipment for workshops and labs; (ii) local and national origin consumables; (iii) spare parts. (c) Meetings held with potential suppliers to explain standards and qualifications required and review the feasibility of involvement. • A summary of industries capable of participating in non-nuclear safety related construction or support services activities with any required actions and funding requirements.
18.2. Need for strict application of quality programmes for nuclear equipment and services recognized.	• If the national policy for industrial involvement supports the involvement of industrial involvement in construction or support services, a policy and plan for development of an appropriate management system (including quality control and quality assurance), along with evidence of the availability of the appropriate investment requirements.

[a] Typically, the first nuclear power plant is constructed with very limited local industrial involvement. This can be introduced gradually as national experience increases and the programme develops.

19. Procurement	Phase 1
Conditions	Basis for evaluation
19.1. Unique requirements associated with purchasing nuclear equipment and services recognized.	• Clear recognition of the issues related to procurement covering local, national and foreign supplies, and a plan to develop the following aspects during phase 2: (a) Specialized procurement team (b) Filing of: design descriptions, technical specifications, drawings of items to be procured. (c) Quality levels to be assigned, depending on the relevance of the item. (d) Standards and codes ruling the item. (e) Environmental qualification of the item (including storage conditions on the shelf, expiry dates, etc.) (f) Stock policy to be adopted. (max./min levels). (g) Urgent procurement procedures. • A recruitment and training programme to build up the procurement team. The programme should cover the following activities: (a) Bid requesting and bid evaluation; (b) Awarding, issuing of purchase orders; (c) Letter of credit; (d) Quality programmes. Inspection, hold points and stopping work during manufacturing; (e) Manufacturing schedule and delivery time; (f) Testing and reception; (g) Transportation and insurance; (h) Taxes; (i) Customs clearing.
19.2. Consistent policies for nuclear procurement in place.	• If the national policy for industrial involvement supports the involvement of industrial involvement in construction or support services, a policy and plan for development of an appropriate management system (including quality control and quality assurance), along with the evidence of the availability of appropriate investment requirements.

3.3. EVALUATION OF INFRASTRUCTURE STATUS IN PHASE 2

1. National position	Phase 2
Conditions	Basis for evaluation
1.1. Government support evident.	• Evidence that an ongoing government role for nuclear power programme implementation has been clearly defined and established within a government agency (e.g. energy or industry). • Appropriate bilateral agreements in place with vendor countries.
1.2. Commitments and obligations of owner/operator organizations established.	• Document setting out responsibilities of key national organizations and intended contracting strategy. • Clear understanding of the organization being licensed to operate the nuclear power plant and evidence of adequate resources to comply with license requirements. Clarity of role and responsibilities of the owner if different from the license holder. • If the vendor is undertaking any initial owner responsibilities, clear plans on how ownership, knowledge and capability will be transferred.

2. Nuclear safety [a]	Phase 2
Conditions	Basis for evaluation
2.1. Safety responsibilities by all stakeholders recognized.	• Roles and responsibilities clearly defined with respect to nuclear safety in the operating, regulatory and technical support organizations. • Protocol agreed for interactions between operator, regulator, vendor and technical support organizations. • Process and responsibilities defined for review and understanding of information supplied by the vendor during construction. • Training programmes for regulators, operators and technical specialists defined, including the process for information exchange with design specialists. • Evidence of how staff members have acquired the necessary knowledge in nuclear safety covering national and international standards, nuclear safety good practices, for example, as set out in the IAEA Safety Standards. • Evidence that the categorization of the safety importance of systems, structures and components and the implications for quality and safety assessment is understood. • Evidence that the safety requirements to ensure criticality safety during the handling of nuclear material are understood and that processes are in place to ensure compliance with requirements.
2.2. Safety culture evaluated.	• Operational feedback process defined involving all relevant organizations, including the review of international events. • Report summarizing steps taken to ensure safety culture, review of effectiveness and future plans to maintain a high level of safety culture.
2.3. Long term relationship with supplier established.	• Contract planned to define the required levels of support from vendors and the mechanisms for information exchange, training, technical support, etc.

[a] Note that safety considerations need to include adequate consideration of security needs and vice versa.

3. Management	Phase 2
Conditions	• Basis for evaluation
3.1. BIS available.	• Documented bid invitation specification (BIS) available.[a]
3.2. Adequate staff available to prepare for and analyse bids.	• Description of organization, including roles and responsibilities of departments and individuals with respect to bid assessment, supervision of construction, development of knowledge base, understanding of operating and maintenance requirements. • Evidence that staff members are trained/qualified.
3.3. Bid evaluation criteria determined.	• Clear description of how bids will be evaluated. Evidence that criteria include any country specific requirements, safety and security aspects, the complete fuel cycle requirements, as well as financial, legal, technical and commercial aspects.
3.4. Contracting strategy established.	• Document reviewing contracting strategies and justifying the chosen approach. Approval that the chosen strategy is consistent with national legislation. Implications recognized and plan to fulfil necessary requirements in place.
3.5. Project management organization established.	• Justification of adequate staffing (numbers, skills, experience). • Roles and responsibilities within the organization clearly defined, particularly with respect to control of work and acceptance. • Project reporting mechanisms defined. • Acceptance procedures and criteria defined. • Plans to acquire/develop required commissioning skills. • Interfaces with other organizations defined and agreed on
3.3. Management systems established.	• All participating organizations (including the regulatory bodies) established and have documented management systems which promote strong safety safeguards and security culture. Management systems are consistent with IAEA recommendations [10].

[a] The documentation issued by the owner/operator to prospective suppliers of the nuclear power plant.

4. Funding and financing	Phase 2
Conditions	Basis for evaluation
4.1. Strategy for management of financial risks available.	• Document identifying level of borrowing intended and nature of guarantees. • Risk management plan identifying all the key financial risks, the owner, likelihood, consequence, how they are being controlled and mitigated, including the nature of any guarantees. These need to cover the impact of a significant event on: prolonged shutdown, public liabilities, delays in construction, regulatory delays and government/public intervention.
4.2. Funding and financing plan available.	• Means of funding the regulatory body established. • Report comparing financial performance against the plan approved at milestone 1 (see Condition 4.2 in Section 3.2) in order to demonstrate a sound budgeting, monitoring and control process; funding identified at milestone 1 was made available during phase 2. The document should also clearly identify lessons learned and actions taken. • Phase 3 financing plan for selected site matched to vendors plan including all national commitments for participation in construction, for operator costs, regulator costs, other stakeholders, emergency planning. • For each element and for the aggregated requirements, a ratio of financing achievement approaching 90%, i.e.: mobilized/committed financial resources, demonstrated. • Resource requirements estimated and committed.

5. Legislative framework	Phase 2
Conditions	**Basis for evaluation**
5.1. International legal Instruments governing nuclear activities in force.	• Evidence that the State has adopted relevant international legal instruments governing nuclear activities, in particular: (a) The Convention on Early Notification of a Nuclear Accident. (b) The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. (c) The Convention on Nuclear Safety. (d) The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. (e) The Convention of Physical Protection of Nuclear Materials and its Amendment. (f) The Vienna Convention on Civil Liability for Nuclear Damage, the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage and the Convention on Supplementary Compensation for Nuclear Damage. (g) Comprehensive safeguards agreement between the State and the IAEA.[a] (h) Revised Supplementary Agreement concerning the provision of technical assistance by the IAEA.
5.2. A comprehensive nuclear law is enacted and in force.	• Evidence that the State has promulgated national nuclear legislation, including the following main elements: (a) Establishing an independent regulatory body with clear functions. (b) Establishing an authorization system, responsibilities of the operator, inspection and enforcement. (c) Formulation of principles and requirements (for each subject area, e.g. radiation protection, radiation sources, nuclear installations, radioactive waste management and spent fuel, decommissioning, mining and milling, emergency preparedness, transport of radioactive material). (d) Establishing compensation mechanisms for nuclear damage. (e) Implementing IAEA safeguards. (f) Implementing import and export controls of nuclear material and items. (g) Formulation of security principles including physical protection of nuclear material and facilities.
5.3. All legislation dealing with the nuclear power programme developed, promulgated and in force.	• Evidence that the State has adopted other laws relevant to a nuclear power programme, in particular in the following areas: (a) Environmental protection. (b) Emergency preparedness and management. (c) Occupational health and safety of workers. (d) Protection of intellectual property. (e) Local land use controls. (f) Foreign investment. (g) Taxation. (h) Roles of national government, local government, stakeholders and the public. (i) Financial guarantees. Further detail is available in the IAEA Handbook on Nuclear Law [13].

[a] The IAEA encourages Member States to consider concluding an additional protocol.

6. Safeguards	Phase 2
Conditions	Basis for evaluation
6.1. Terms of international safeguards agreement in place.	• Comprehensive safeguards agreement and associated subsidiary arrangements are in force with the IAEA.[a]
6.2. SSAC established and operational.	• Evidence of an established and technically competent SSAC, including designation of national authority and definition of role, responsibilities and reporting methods. • Plans to maintain the technical competence and provision of necessary resources to the SSAC to match the development of the nuclear power programme. • Evidence through information exchange with the IAEA that the SSAC has a good understanding of the principles of safeguarding a nuclear power plant, including the type of equipment the IAEA may install in the facility.
6.3. Early safeguards relevant information provided to IAEA	• Information on technology and list of designs being included in the BIS. If a design has already been chosen, design information submitted to the IAEA with any specific national variations.
6.4. Specific legislation and relevant safeguards procedures in place	• Legislation reviewed by the IAEA and any outstanding actions implemented.

[a] The IAEA encourages all States with a CSA to conclude an additional protocol.

7. Regulatory framework	Phase 2
Conditions	Basis for evaluation
7.1. Independent nuclear regulatory body established	• A report evaluating the relevant regulatory functions against those described in IAEA Safety Standards Series No. GS-R-1 [6] and the criteria defined in the IAEA Integrated Regulatory Review Service (IRRS) methodology. Information should include: (a) Clear description of roles, responsibilities, organization structure, staffing requirements, areas requiring expert and consultant services. (b) Documented formal management system. (c) Training plans to provide required SQEP staff for all roles. (d) Plans for the development and maintenance of an appropriate safety, security and quality structure. (e) Links established with other international regulatory bodies, regional and international regulator forums. (f) Clear definition of information requirements at each stage of construction and definition of hold points and process for clearance. (g) Agreed process for certification of operators. (h) Agreed policy and process with respect to public availability of information, including dealing with commercially sensitive information. (i) Process for keeping of records. (j) Reconstruction safety report assessed or clear evidence that there is sufficient competence to complete assessment prior to construction of the chosen design. (k) Codes and standards to be used listed for each area. Evidence of understanding of requirements. Justification of mix of national, foreign and international standards and codes. The areas covered should include: (i) Transport, storage and handling of nuclear and radioactive material; (ii) Radiation protection including remediation; (iii) Site licensing; (iv) Siting; (v) Environmental protection; (vi) Design; (vii) Construction; (viii) Commissioning; (ix) Decommissioning; (x) Security and safety; (xi) Waste management; (xii) Emergency planning. • One approach to reviewing the above is to request an IAEA Safety Review Service (Graded IRRS).

8. Radiation protection	Phase 2
Conditions	Basis for evaluation
8.1. Actions to prepare adequate radiation protection programs undertaken.	• Radiation monitoring and protection programmes in place for occupational exposure of workers, the public and environment, and capable of dealing with construction and any training of staff at other locations. • An environment monitoring programme in place. The preliminary results will constitute the 'finger print' to be used in comparing with the values to be recorded during the commercial operation. • The appropriate equipment and systems for radiation monitoring are included in the BIS. • The owner/operator plan for radiation protection has been submitted to the regulator for review.
8.2. Expansion of appropriate infrastructures planned.	• Evidence that all relevant organizations have analysed the skill requirements associated with implementing a nuclear power programme. • Requirements for the expansion of regulatory and specialist organizations defined, funded and recruitment/training plans in place.

9. Electrical grid	Phase 2
Conditions	Basis for evaluation
9.1. Detailed studies to determine grid expansion, upgrade or improvement undertaken.	• Plans to address the grid requirements associated with the inclusion of the nuclear power plant. The plans should include: (a) Enhancement and/or expansion compatible with the increased generating capacity. (b) Achieving the overall grid stability and reliability requirements for safe operation. (c) Justification of the reliability/capacity of the 'off-site power' for the nuclear power plant. Redundant independent 'off-site lines' should be considered. (d) Provision of grid specifications into the BIS. (e) Plans and programmes to train regional and national grid controllers covering the installation of a nuclear power plant in the grid (behaviour, transients, etc.). (f) Plans to define a procedure addressing the interactions between the nuclear power plant and the grid including protocols to be agreed with the controller covering connection and disconnection of the plant and urgent and emergency procedures.
9.2. Plans, funding and schedule for grid enhancement available.	• Evidence that funding and schedules for grid enhancements, compatible with the foreseen construction, testing and commissioning, have been approved and that delivery times of towers, lines and components, substations and switch yards are consistent with the construction schedule.

10. Human resources	Phase 2
Conditions	Basis for evaluation
10.1. Knowledge and skills needed in organizations for Phase 3 and operational phase identified.	• Evidence that staff members have appropriate skills and experience, particularly in: (a) Types of proven designs of nuclear power plants and potential suppliers. (b) Main technical characteristics of potential plants. (c) Nuclear and radiation safety. (d) Owner/operator technical and legal inputs (funding and financing, legal framework, site, regulations, licensing process, grid characteristics, etc.). (e) Contracting methodologies. (f) Project management. (g) National and local participation capabilities and targets. (h) Public information and communications. • Evidence that appropriate staff members have visited operating plants similar to those being considered. • Evidence that all the skills required to write bid specifications and evaluate submitted information are in place. This should cover technical, management and commercial issues. • An analysis of the competences needed in all organizations involved in phase 3 and the initial operational phase. The analysis should: (a) Include contributions from each of the organizations. (b) Reflect realistic expectations regarding the owner's scope of supply and that of other organizations. (c) Ensure an appropriate balance of skills between operating organization, regulator and specialist organizations, with adequate training in each. (d) Include consideration of a remuneration structure that will ensure that all organizations are adequately staffed. (e) Address the needs of support organizations (e.g. for maintenance, refurbishment, replacement) including appropriate training programmes. (f) Address requirements for changes to national education infrastructure. • Recruitment and training programmes covering: (a) Technical requirements (including nuclear specific technical capabilities); (b) Business requirements. (c) Public relations requirements. (d) Fuel procurement. (e) Construction management and commissioning. (f) Operation and maintenance.

10. Human resources	Phase 2
Conditions	Basis for evaluation
10.2. A plan to develop and maintain the human resource base in organizations for phase 3 and operational phase is developed.	• Adequate training programmes for maintenance and operation, and for technical support personnel. • Evidence of sufficient competence in key organizations to specify training requirements. • Evaluation of the need for training abroad at operating plants similar to those being considered. Any necessary language training started or planned. • Programmes in place for the involvement of future operation and maintenance personnel with the construction and commissioning groups. • Evidence that licensing requirements have been taken account of in training programmes, in order to remove the risk of startup delays due to lack of licensed personnel. • A human resource development plan that identifies the requirements of the owner and other key stakeholders during phase 3 and initial plant operations. The plan should address the resources that are available, those that are expected to be recruited/developed nationally and the external resources needed to augment national resources. • Key stakeholder organizations have participated in the development and review of the above plan. • The BIS addresses what is required from the supplier with respect to the training and development of resources to carry out the owner and support responsibilities during commissioning, and initial plant operations. • The BIS includes the provision of simulator training requirements.

11. Stakeholder involvement	Phase 2
Conditions	**Basis for evaluation**
11.1. Public information and education programme developed.	• For each of the main organizations (government, regulator, and operator), a clear statement of the role and responsibilities in proactive stakeholder management covering: public, local government, industry, media, NGOs, opposition groups, neighbouring countries. • An inter-organization stakeholder management strategy, evidence of regular review meetings and integrated stakeholder management plans for each organization. • Evidence of training and experience of spokespersons. • Material produced in a range of media formats addressing all key stakeholder groups. • Records of stakeholder meetings held and follow up actions taken. • Evidence that local issues have been identified and addressed. • Consultative committee representing local interests established. • Statement of regulator policy regarding availability of information to the public. • Evidence that the role of the regulator is understood by stakeholders and that they are perceived as competent and independent. • Evidence of ongoing government communications regarding energy policy, the benefits of nuclear power and response to issues raised. • Review of public acceptance through means such as opinion polls or meetings. • Evidence of communications from operator and regulator explaining technology being used, why chosen and why safe.

12. Site and supporting facilities	Phase 2
Conditions	**Basis for evaluation**
12.1. Detailed site characterization completed.	• Evidence that the site(s) identified in the BIS are owned/available for use to the organization issuing the BIS. • Report demonstrating ranking of possible sites and basis of the chosen site or sites. • Evidence that the site(s) meets all siting requirements and the necessary characterization studies have been completed. These should cover: (a) Integration into the grid; (b) Geology and tectonic; (c) Seismology; (d) Heat removal capability; (e) Hydrology; (f) Demography; (g) Meteorology; (h) Environmental issues; (i) External hazards; (j) Local infrastructure; (k) Access; (l) Legal issues; (m) Security. • Evidence that local legal, political and public acceptance issues have been identified and resolved or their resolution planned. • Analysis of sites required for fuel interim storage, and for waste conditioning, storage and, where appropriate, disposal. • Evidence that transport between sites has been satisfactorily addressed.
12.2. Site ready for construction.	• Infrastructure either exists or is planned to support construction, e.g. access, workforce housing, water and construction materials. Any outstanding work is planned to meet construction requirements. • Existing and planned site facilities are clearly described in the BIS.

13. Environmental protection	Phase 2
Conditions	**Basis for evaluation**
13.1. Environmental studies for selected sites performed.	• An environmental impact assessment completed in accordance with national requirements.
13.2. Particular environmental sensitivities included in BIS.	• Information related to site specific environmental issues included in the BIS, including: (a) Pathways for the transport of effluent into the environment defined and characterized. (b) Local population demographics and trends. (c) Predominant plant and animal life and relevant radioecological sensitivities. (d) Predominant land use. (e) Data relevant to justifying heat removal capability. (f) Sites and means for disposal of hazardous waste. (g) Local environment issues affecting construction.
13.3. Clear and effective regulation of environmental issues established.	• Environmental regulatory role clearly established either within nuclear regulator or within existing environment regulator. • Adequate skills and resources to assess the acceptability of design information and inspect activities during construction. • Plan for developing environmental monitoring capability. • Plan for creating the site baseline information.

14. Emergency planning	Phase 2
Conditions	**Basis for evaluation**
14.1. Detailed approach to emergency planning being implemented.	• Basic regulations developed and communicated to all relevant organizations • Clear roles and responsibilities for each organization involved. • Clear chain of command for emergency response management established. • Identification of the size and type of accident to be covered by the plan (i.e. threat assessments performed). • Outline plans prepared and discussed between organizations. Any impediments to sheltering or evacuation have been identified. • Procedures have been defined and agreed on or there is a commitment to develop them before operation, covering: (a) Protection of emergency workers; (b) Dissemination of information to the public; (c) Medical response; (d) Immediate and long term environmental protection; (e) Non-radiological consequences. • Relevant demographic information has been collated and studied by appropriate organizations. • Plan showing development, approval and testing of emergency plan and procedures completed before the first nuclear fuel arrives on-site. • Evidence showing plans for relations and communications with neighbouring countries and the IAEA
14.2. Emergency planning for existing radiation facilities and practices in place.	• If an EPREV of existing arrangements has been undertaken, confirmation by the IAEA that recommendations of EPREV are implemented and capabilities and arrangements for emergency preparedness and response are in place.
14.3. Actions from earlier reviews completed.	• Completion of all actions from any previous audit or review of existing systems against international requirements such as those in IAEA Safety Standards Series Nos GS-R-2 [11] and GS-G-2.1 [12].

15. Security [a]	Phase 2
Conditions	**Basis for evaluation**
15.1. Legislation promulgated.	• Arrangements and draft of agreements covering protocols and programmes for local and national law enforcement assistance.
15.2. DBT defined.	• The design basis threat defined and outline of security requirements included in the BIS.
15.3. Security requirements defined.	• Security requirements and desirable features planned for the site. • Evidence that best practise for security at the nuclear power plant is understood.
15.4. Sensitive information defined.	• Procedures for the definition and protection of sensitive information. Penalties for violation available and supported by legislation.
15.5. Physical protection by trained on-site security staff provided.	• Security requirements during construction defined, including on-site civil security personnel and a policy on whether armed, and a plan for their implementation.
15.6. Programmes for selection/qualifications of staff with access to facilities are in place.	• Adequate screening programmes for recruitment and selection of personnel with access to facilities and classified documentation.
15.7. Security culture promulgated.	• Evidence of the promulgation of a security culture, recognizing the importance of nuclear material, within all key organizations involved in the nuclear power programme.

[a] Note that security considerations include physical protection and also need to include adequate consideration of safety needs and vice versa.

16. Nuclear fuel cycle	Phase 2
Conditions	**Basis for evaluation**
16.1. Fuel cycle strategy decided	• A completed nuclear fuel cycle planning document applying the NEPIO knowledge of the steps and approaches, defining a realistic nuclear fuel cycle strategy at a level of detail appropriate for milestone 2. • Evidence that basic decisions needed for milestone 2 have been made for both front and back ends of the nuclear fuel cycle. These include a decision on the number of reloads to be requested with the first core and a short and long term purchasing strategy for the fuel services (natural uranium, conversion, enrichment, fuel manufacturing, fuel take back), on-site spent fuel storage capacity and a strategy for purchasing/building this capacity (e.g. capacity of reactor pools). • An integrated plan for bidding and construction of fuel cycle facilities consistent with the power plant construction programme and the national non-proliferation commitment.

17. Radioactive waste	Phase 2
Conditions	**Basis for evaluation**
17.1. Handling the burdens of radioactive waste considered.	• A defined national waste management organization. • A strategy document prepared by the waste management organization to implement the national policy for the management of all types of radioactive waste, considering regulatory and implementation infrastructures, allocation of responsibilities, technical approaches and capabilities, financing schemes, etc. • Regulatory capabilities established able to license, regulate, assess, control and enforce safety requirements for radioactive waste management, including further disposal options. • A completed radioactive waste planning document applying the NEPIO understanding of the significant implications of radioactive waste at a level of detail appropriate for milestone 2 (e.g. volumes and isotopic content of waste have been estimated). • An integrated plan for bidding and construction of waste facilities consistent with the power plant construction programme.
17.2. Implementation plan for ultimate high level waste disposal in preparation.	• A planning document completed based on the established national policy/strategy and recognizing options for the management and final disposal of high level radioactive waste. Responsibility assigned for monitoring international efforts and progress on high level waste disposal.

18. Industrial involvement[a]	Phase 2
Conditions	**Basis for evaluation**
18.1. Realistic assessment of the national and local capabilities carried out.	• A realistic assessment of the national and local supplier capabilities for either nuclear or non-nuclear safety related activities based on the national policy recommended by the NEPIO. • Extent of national industrial participation agreed and established and desired targets for local and national industrial involvement included in the BIS.
18.2. Ability to meet schedule and quality requirements analyzed.	• Requirements for industries to be added to the approved vendor/service suppler list together with procedures for audits of the management systems (including quality control and assurance) of the approved vendor/supplier.
18.3. Plans and programmes to transition to national and local suppliers in place.	• If the national policy for industrial involvement supports the involvement of industrial involvement in construction or support services, clear plans and programmes identifying: (a) Specific industrial involvement in future construction, maintenance or operational support services. (b) Audits of the progress of industrial preparation and ability to meet the requirements for additions to the approved supplier. (c) Short term and long term programmes (including future projects) to develop the ability to produce items initially being supplied by foreign suppliers. (d) Consideration of mechanisms to be agreed with the main supplier to convert national items into foreign supplied items and vice versa, in case supply problems have a major impact on the construction schedule.

[a] Typically, the first nuclear power plant is constructed with very limited local industrial involvement. This can be introduced gradually as national experience increases and the programme develops.

19. Procurement	Phase 2
Conditions	**Basis for evaluation**
19.1. Owner/operator competence to carry out nuclear procurement evident.	• Evidence of a suitably qualified and experienced procurement team with competence in: (a) Bid requesting and bid evaluation. (b) Awarding, issue of purchase orders. (c) Letter of credit. (d) Quality programmes. (e) Surveillance and follow up of items under manufactureg. (f) Inspection, hold points and stopping work during manufacturing. (g) Corrective actions to be taken when quality or schedule requirements are under risk. (h) Manufacturing schedule and delivery time. (i) Testing and reception. (j) Non conformance report and acceptance procedure established (accepted as is, refurbishment necessary, rejected). (k) Transportation and insurance. (l) Taxes. (m) Customs clearance. • Evidence of an informed decision about the need for the procurement office close to main supplier. • Plans to participate in appropriate 'owners group'.
19.2. Procurement programme consistent with national policy for industrial participation established.	• A procurement programme clearly described in the bid BIS that delineates the scope of supply for specific equipment and services. • If the national policy for industrial involvement supports local involvement in construction or support services, evidence of a procurement team competent in: (a) Filing of: design descriptions, technical specifications, drawings of items to be procured. (b) Quality levels to be assigned, depending the relevance of the item. (c) Standards and codes ruling the item. (d) Environmental qualification of the item (including storage conditions on the shelf, expiry dates, etc.). (e) Stock policy to be adopted (max/min levels). (f) Urgent procurement procedures. • Formal equipment and services specifications have been developed by the owner/operator. • Approved vendor list has been developed and a routine auditing program is in place. • A schedule identifying purchase orders placement dates and site arrival dates.

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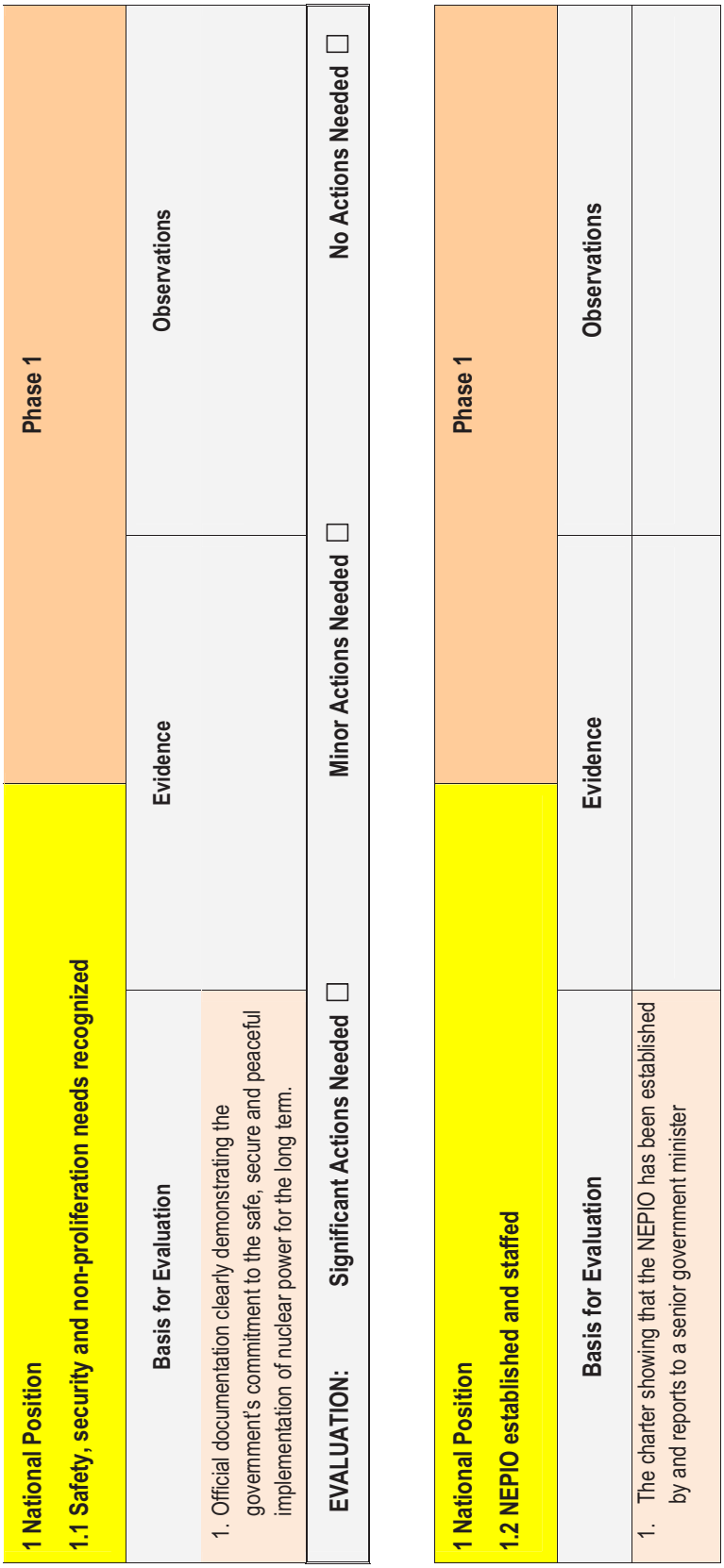
ACRONYMS

BIS	Bid invitation specification
BOO	Build–own–operate
BOOT	Build–own–operate–transfer
CSA	Comprehensive safeguards agreement
EPREV	Emergency Preparedness Review
IRRS	Integrated Regulatory Review Service
NEPIO	Nuclear Energy Programme Implementing Organization
NPP	Nuclear power plant
NGO	Non-government organization
NPT	Treaty on the Non-Proliferation of Nuclear Weapons
OSART	Operational Safety Review Team
SQEP	Suitably qualified and experienced personnel
SSAC	State system of accounting for and control of nuclear material
WANO	World Association of Nuclear Operators

Appendix

EXAMPLES OF EVALUATION FORMS

1. EVALUATION FORM FOR EACH INFRASTRUCTURE ISSUE



1 National Position 1.1 Safety, security and non-proliferation needs recognized	Phase 1	
	Basis for Evaluation	Evidence	Observations
	1. Official documentation clearly demonstrating the government's commitment to the safe, secure and peaceful implementation of nuclear power for the long term.		
EVALUATION: Significant Actions Needed ☐ Minor Actions Needed ☐ No Actions Needed ☐			

1 National Position 1.2 NEPIO established and staffed	Phase 1	
	Basis for Evaluation	Evidence	Observations
	1. The charter showing that the NEPIO has been established by and reports to a senior government minister		

1 National Position 1.2 NEPIO established and staffed	Phase 1	
Basis for Evaluation	**Evidence**	**Observations**
2. The roles and responsibilities defined in the charter are known by other government ministries and key members of the NEPIO.		
3. The NEPIO charter clearly charges and authorizes the preparation of a comprehensive report to identify the commitments and conditions necessary to establish a national nuclear power programme. It defines an adequate scope of investigations and clear definition of objectives and timescales. It should identify how its mandate and activities fit with the overall plan for implementing the nuclear power option.		
4. A clear description of how the NEPIO operates in terms of funding, office accommodation and equipment, reference material.		
5. Evidence showing adequate interactions between, and support from, appropriate ministers such as those responsible for energy, environment, etc.		
6. A documented budget planning and reporting process showing appropriate funding is provided to and expended by the NEPIO to fulfil its charter in the scheduled time.		

1 National Position 1.2 NEPIO established and staffed		Phase 1
Basis for Evaluation	**Evidence**	**Observations**
7. Organization chart; job descriptions and CVs of members demonstrating appropriate skills, qualifications and experience to address all of the infrastructure issues based on requirements in IAEA-TECDOC-1513. This includes appropriate use of consultants and the demonstration of national staff as 'intelligent customer'.		
EVALUATION:	**Significant Actions Needed** ☐	**Minor Actions Needed** ☐ **No Actions Needed** ☐

1 National Position 1.3 National strategy defined		Phase 1
Basis for Evaluation	**Evidence**	**Observations**
1. Organization chart; job descriptions and CVs of members demonstrating appropriate skills, qualifications and experience to address all of the infrastructure issues based on requirements in IAEA-TECDOC-1513. This includes appropriate use of consultants and the demonstration of national staff as 'intelligent customer'.		
2. Comprehensive report produced by the NEPIO covering all areas identified in the Milestones publication (NG-G-3.1) and recognizing the resources and timescales required for the activities required for phase 2. A demonstration that the Member State can provide the overall resources required integrated across all areas. (Detailed requirements for the contents of the comprehensive report are identified under each of the following issues). 3. Executive summary of comprehensive report is based on detailed report, contains estimates of total resources and timescales and has been properly reviewed by senior government officials		
EVALUATION: **Significant Actions Needed** ☐	**Minor Actions Needed** ☐	**No Actions Needed** ☐

2. EXAMPLE SUMMARY FORM

1. National Position	**Phase 1**
Condition	**Status**
1.1. Safety, security and non-proliferation needs recognized.	Minor Actions Needed
1.2. NEPIO established and staffed.	No Actions Needed
1.3. National strategy defined.	No Actions Needed
2. Nuclear Safety	**Phase 1**
Condition	**Status**
2.1. Understanding of key elements of nuclear safety.	Minor Actions Needed
2.2. Need of intergovernmental instruments on safety.	No Actions Needed
2.3. Support through international cooperation.	Significant Actions Needed
3. Management	**Phase 1**
Condition	**Status**
3.1. Energy strategy and nuclear power compatibility analysed.	Minor Actions Needed
3.2. Unique Member State conditions evaluated.	No Actions Needed
3.3. Available nuclear technologies identified.	No Actions needed
3.4. Ownership options and operational responsibilities considered.	Significant Actions Needed
3.5. Authorities and responsibilities established.	No Actions Needed
3.6. Appropriate expertise and experience.	Minor Actions Needed
3.7. The management systems of all participating organizations are used to promote and support a strong safety culture.	Significant Actions Needed
4 Funding and Financing	**Phase 1**
Condition	**Status**
4.1. Adequate funding provided for the NEPIO to fully assess the commitments required to implement a nuclear power programme.	Significant Actions Needed
4.2. Strategies established for funding and financing.	No Actions Needed

1 National Position		Phase 1		
1.1. Safety, security and non-proliferation needs recognized				
Ref. No.	Observations	Agreed Action	Resp. Person	Due Date
1.1.1.				
1.1.2.				
1.1. . .				
1.2. NEPIO established and staffed				
Ref. No.	Observations	Agreed Action	Resp. Person	Due Date
1.2.1.				
1.2.2.				
1.2. . .				
1.3. National strategy defined				
Ref. No.	Observations	Agreed Action	Resp. Person	Due Date
1.3.1.				
1.3.2.				
1.3. . .				

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