



MISSION REPORT
ON
THE INTEGRATED NUCLEAR INFRASTRUCTURE
REVIEW
(INIR)

Counterpart: The Government of the Republic of Kenya

24 – 31 August 2015

Nairobi, Kenya

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EXECUTIVE SUMMARY

Due to a projected increase in energy demand and the role of energy to enable the country's long term development strategy, Kenya recognized the need to diversify its energy sources. This recognition is supported by the country's development blueprint, Vision 2030, which aims at creating "a globally competitive and prosperous country with a high quality of life by 2030". Vision 2030 identifies energy as one of the key requirements for achieving this goal, and as a result, Kenya's Least Cost Power Development Plan (LCPDP), a power sector long term national development plan, included the nuclear option to the future power mix that will enhance the national power generation capacity. Both the LCPDP and the National Energy and Petroleum Policy identify nuclear power as a potential energy source.

Kenya has an existing legal and regulatory framework covering radiation sources in agriculture, medicine, industry and research. Under this framework, the Kenya Radiation Protection Board (RPB), within the Ministry of Health, is responsible for radiation safety, security of radioactive and nuclear materials, safeguards and other related matters for the existing activities in the country.

In November 2010, the Ministry of Energy and Petroleum established the Nuclear Electricity Project Committee (NEPC), which was transformed into the Kenya Nuclear Electricity Board (KNEB) two years later. KNEB was mandated to undertake preparatory activities towards the development and implementation of the country's nuclear power programme, including:

- Capacity building and human resource development;
- Comprehensive legal and regulatory framework;
- Publicity and advocacy;
- Nuclear prefeasibility and feasibility studies;
- Development of the nuclear power programme roadmap;
- Collaborative programmes;
- Upfront siting studies.

In 2013, KNEB finalized a prefeasibility study report to provide the Kenyan Government with a comprehensive understanding of the various obligations and commitments involved in the establishment of a nuclear power programme, and enable an informed decision regarding the viability of the programme. A summary of this report was submitted to the Ministry of Energy and Petroleum for adoption.

In a letter dated 1 April 2014, Executive Chairman of KNEB, Mr Ochilo Ayacko, requested the International Atomic Energy Agency (IAEA) to carry out a Phase 1 Integrated Nuclear Infrastructure Review (INIR) mission in the Republic of Kenya. A Self Evaluation Support mission was conducted in January 2015 and a final draft of Kenya's Self Evaluation Report of its nuclear infrastructure was received on 15 July 2015. The Phase 1 INIR mission was conducted from 24 to 31 August 2015.

The INIR mission was coordinated by KNEB. The Principal Secretary, Ministry of Energy and Petroleum, Eng. Joseph Njoroge and the Executive Chairman of KNEB, Mr. Ochilo Ayacko, opened the INIR mission for the Government of Kenya. Ms Anne Starz, Senior Advisor for Policy and Strategy, Department of Nuclear Energy, provided opening remarks

for the IAEA. The INIR mission team was led by Mr Jose Bastos of the Nuclear Infrastructure Development Section, IAEA, and consisted of staff from the Departments of Nuclear Energy, Nuclear Safety and Security, Safeguards and the Office of Legal Affairs and international experts recruited by the IAEA.

The INIR mission and associated activities were supported through a combination of support from the Government of Kenya and the National Technical Cooperation Project KEN2006 “Building Capacity for the Implementation of a Nuclear Power Programme by Developing Human Resources, Institutional Capacity and the Legal and Regulatory Framework”, which includes an extra budgetary contribution from the United States through a Peaceful Uses Initiative Project entitled “Strengthening Nuclear Power Infrastructure Development in Member States”.

The INIR team found that Kenya has made significant progress in its preparations to make decisions related to the introduction of nuclear power. Kenya has made a notable investment in human capacity building and thoroughly considered all of the infrastructure issues described in the NE Series guide, “Milestones in the Development of a National Infrastructure for Nuclear Power”.

In order to assist Kenya in making further progress in its infrastructure development, the INIR mission team made 15 recommendations and 8 suggestions, many of which relate to the planning of Phase 2 activities. The INIR mission team also identified 4 good practices that may benefit other countries considering the introduction of nuclear power. Based on the recommendations and suggestions, the key areas for further action are summarized below:

Kenya should complete the establishment of key goals and requirements to guide the nuclear power programme

KNEB has undertaken a number of studies on key issues related to the development of the nuclear power programme. KNEB should use this work to develop and identify the high level goals and requirements specific to Kenya and seek governmental endorsement. These areas include: the nuclear fuel cycle; radioactive waste management; industrial involvement; and nuclear power plant ownership and financing. Having a clear view about these issues will ensure that the nuclear power programme will bring the desired benefits to the country and provide an important input to key policies, including the development of the legal and regulatory framework.

Kenya should further develop its legal and regulatory framework for the nuclear power programme

Kenya is in the process of developing its legal and regulatory framework for the nuclear power programme. Both, the Technical Working Group, established under the Ad Hoc Inter-Ministerial Committee, and the Radiation Protection Board, are developing draft comprehensive nuclear legislation that each establishes regulatory bodies with authority over nuclear and radiation safety, security and safeguards.

Kenya should finalize a single Bill to cover all nuclear regulatory matters, and determine its approach for regulatory oversight of the nuclear power programme. It is important for Kenya to make this decision as the programme progresses to pave the way for further development of the safety, security and safeguards infrastructure, including identifying the potential senior leadership for regulatory oversight.

Preparing for Phase 2 of the nuclear power programme

In order to be prepared for Phase 2, Kenya needs to complete various planning activities, including the cost estimates and respective budgets. Plans should be developed to address areas including the establishment of the necessary human resources, management systems, procurement and contract management functions, leadership development, and safety and security culture programmes. Kenya should also prepare for the completion of site selection activities, in accordance with a process endorsed by relevant stakeholders.

1. INTRODUCTION

In a letter dated 1 April 2014, Executive Chairman of KNEB, Mr Ochilo Ayacko, requested the International Atomic Energy Agency (IAEA) to carry out a Phase 1 Integrated Nuclear Infrastructure Review (INIR) mission in the Republic of Kenya. A Self Evaluation Support mission was conducted in January 2015 and a final draft of Kenya's Self Evaluation Report of its nuclear infrastructure was received on 15 July 2015. A pre-INIR mission was conducted from 27 to 28 May and the Phase 1 INIR mission was conducted from 24 to 31 August 2015.

The INIR mission was coordinated by KNEB. The Principal Secretary, Ministry of Energy and Petroleum, Eng. Joseph Njoroge and the Executive Chairman and Chief Executive Officer (CEO) of KNEB, Mr Ochilo Ayacko, opened the INIR mission for the Government of Kenya. Ms Anne Starz, Senior Advisor for Policy and Strategy, Department of Nuclear Energy, provided opening remarks for the IAEA. The INIR mission team was led by Mr Jose Bastos of the Nuclear Infrastructure Development Section, IAEA, and consisted of staff from the Departments of Nuclear Energy, Nuclear Safety and Security, Safeguards and the Office of Legal Affairs and international experts recruited by the IAEA.

The INIR mission and associated activities were supported through a combination of support from the Government of Kenya and the National Technical Cooperation Project KEN2006 "Building Capacity for the Implementation of a Nuclear Power Programme by Developing Human Resources, Institutional Capacity and the Legal and Regulatory Framework", which includes an extra budgetary contribution from the United States through a Peaceful Uses Initiative Project entitled "Strengthening Nuclear Power Infrastructure Development in Member States".

2. OBJECTIVES OF THE MISSION

The main objectives of the INIR mission are to:

- Evaluate the development status of the 19 infrastructure issues described in the NE Series guide "Milestones in the Development of a National Infrastructure for Nuclear Power" (NG-G-3.1) applying the holistic approach described in NE Series technical report "Evaluation of the Status of National Infrastructure Development" (NG-T-3.2);

- Identify the areas of the infrastructure needing further actions to reach respective milestones in the building of national infrastructure; and
- Provide recommendations and suggestions to Kenya regarding infrastructure development which can be used in preparation of an Action Plan to address areas for further improvement.

3. SCOPE OF THE MISSION

The INIR mission focused on the status of the infrastructure conditions in Kenya covering all of the 19 infrastructure issues identified in the Milestones publication. Kenya prepared the Self Evaluation Report covering all infrastructure issues using the Phase 1 criteria.

The scope of the INIR mission included:

- Review of the current status of development of the 19 infrastructure issues concerning the Kenya nuclear power programme using the Phase 1 criteria;
- Discussion of outstanding recommendations/actions from recent IAEA missions related to the infrastructure issues;
- Recommendations to address any identified gaps in Phase 1;
- Suggestions for further improvement of the nuclear power infrastructure; and
- Identification of good practices that were observed in the nuclear power infrastructure development.

4. WORK DONE

Prior to the mission, the INIR mission team reviewed the Self Evaluation Report and supporting information that included relevant national laws, regulations, reports and presentations. The INIR mission team sought input from IAEA staff members with relevant expertise working with Kenya's nuclear power programme. Several INIR mission team meetings were conducted prior to the mission, including team meetings in Vienna from 20 to 21 August 2015 and in Nairobi on 23 August 2015.

The INIR mission was conducted from 24 to 31 August 2015. The meetings were held at the Intercontinental Hotel in Nairobi. The main interviews were conducted over four days. During the interviews, the Kenyan counterparts provided an update on the current status of issues where progress had been made since the Self Evaluation Report was finalized.

The preliminary draft report was prepared by the INIR mission team and discussed with the counterparts. The main mission results were presented to representatives of the Government

in an exit meeting on 31 August 2015. The preliminary draft report was delivered to the counterparts during the exit meeting.

The results of the mission are summarized in Section 5 and presented in tabular form in Section 6 for each of the 19 infrastructure issues in Phase 1. Attachment 1 provides the evaluation results for each issue.

5. MAIN CONCLUSIONS

The INIR mission was conducted in a cooperative and open atmosphere with participants from 35 organizations in Kenya involved in the nuclear power programme and corresponding infrastructure. The full list of participants can be found in Attachment 2.

The INIR team found that Kenya has made significant progress in its preparations to make decisions related to the introduction of nuclear power. Kenya has made a notable investment in human capacity building and thoroughly considered all of the infrastructure issues described in the NE Series guide No. NG-G-3.1, “Milestones in the Development of a National Infrastructure for Nuclear Power”.

In order to assist Kenya in making further progress in its infrastructure development, the INIR mission team made 15 recommendations and 8 suggestions, many relating to the planning of Phase 2 activities. The INIR mission team also identified 4 good practices that may benefit other countries considering the introduction of nuclear power. Based on the recommendations and suggestions, the key areas for further action are summarized below:

Kenya should complete the establishment of key goals and requirements to guide the nuclear power programme

KNEB has undertaken a number of studies on key issues related to the development of the nuclear power programme. KNEB should use this work to develop and identify the high level goals and requirements specific to Kenya and seek governmental endorsement. These areas include: the nuclear fuel cycle; radioactive waste management; industrial involvement; and nuclear power plant ownership and financing. Having a clear view about these issues will ensure that the nuclear power programme will bring the desired benefits to the country and provide an important input to key policies and the development of the legal and regulatory framework.

Kenya should further develop its legal and regulatory framework for the nuclear power programme

Kenya is in the process of developing its legal and regulatory framework for the nuclear power programme. Both, the Technical Working Group, established under the Ad Hoc Inter-Ministerial Committee, and the Radiation Protection Board, are developing draft comprehensive nuclear legislation that each establishes regulatory bodies with authority over nuclear and radiation safety, security and safeguards.

Kenya should finalize a single Bill to cover all nuclear regulatory matters, and determine its approach for regulatory oversight of the nuclear power programme. It is important for Kenya to make this decision as the programme progresses to pave the way for further development of the safety, security and safeguards infrastructure, including identifying the potential senior leadership for regulatory oversight.

Preparing for Phase 2 of the nuclear power programme

In order to be prepared for Phase 2, Kenya needs to complete various planning activities, including the cost estimates and respective budgets. Plans should be developed to address areas including the establishment of the necessary human resources, management systems, procurement and contract management functions, leadership development, and safety and security culture programmes. Kenya should also prepare for the completion of site selection activities, in accordance with a process endorsed by relevant stakeholders.

Recommendations

R-1.2.1 Kenya should enhance coordination among the relevant stakeholders to support the development of the nuclear power programme.

R-4.1.1 KNEB should complete its work to estimate the order of magnitude cost of developing the major elements of nuclear infrastructure in order to inform the Government of future budgetary requirements.

R-4.1.2 KNEB should conduct financial modelling to inform the Government on potential financing and ownership options.

R-5.2.1 Kenya should finalize a single Bill to cover all nuclear regulatory matters, and determine its approach for regulatory oversight of the nuclear power programme.

R-5.2.2 Kenya should complete the process for reviewing all relevant laws that need to be considered in relation to its nuclear power program.

R-6.1.1 Kenya should plan for rescinding its Small Quantities Protocol in a timely manner.

R-7.1.1 Kenya should plan the activities to be undertaken by the future regulatory body for early Phase 2 and identify the resources and external technical support necessary.

R-7.1.2 Kenya should identify the potential senior leaders for the future regulatory body.

R-8.1.1 Kenya should identify how the existing radiation protection programme will be enhanced to address the requirements related to nuclear power.

R-10.1.1 Kenya should further develop its national human resource development strategy for the nuclear power programme, including planning for Phase 2.

R-14.1.1 Kenya should assess the emergency preparedness and response requirements and resources necessary for nuclear power.

R-15.1.1 Kenya should designate the competent authority that will develop the national threat assessment and a design basis threat for the nuclear power programme.

R-16.1.1 Kenya should assess the suitability of fuel cycle options, and define and document the national high level goals and requirements for establishing the nuclear fuel cycle.

R-17.1.1 Kenya should assess the suitability of radioactive waste management options for processing, handling, storing and disposal of different radioactive waste types, and define and document the national high level goals and requirements.

R-18.1.1 Kenya should complete its plans to perform a nuclear power specific industrial capability survey and develop a national policy to guide industrial involvement planning and capacity building.

Suggestions

S-1.1.1 KNEB is encouraged to submit the policies and strategies for safety, security and non-proliferation to the Government for endorsement.

S-2.1.1 Kenya is encouraged to develop and implement a strategy to ensure the key stakeholders, including senior leaders, obtain a thorough knowledge of the IAEA Safety Standards and safety culture.

S-3.1.1 KNEB is encouraged to develop a national nuclear power leadership programme.

S-3.1.2 KNEB is encouraged to broaden its knowledge of management system requirements, including relevant IAEA requirements and guidance, for key organisations.

S-5.1.1 Kenya is encouraged to complete the early ratification of the conventions in the area of nuclear safety which it has identified as a priority.

S-6.2.1 Kenya is encouraged to develop a plan for enhancing the SSAC.

S-12.1.1 Kenya is encouraged to prepare for the completion of site selection activities, in accordance with a process endorsed by relevant stakeholders.

S-19.1.1 Kenya is encouraged to clarify the responsibilities and associated plans to establish the necessary capability to manage Phase 2 procurement activities.

Good Practices

GP-1.3.1 Kenya prepared a comprehensive prefeasibility study report, with strong national involvement, which considered all 19 infrastructure issues and provided clear recommendations for further action. This will assist the country in making a knowledgeable decision about the introduction of nuclear power.

GP-4.1.1 Kenya has identified the activities that need to be funded for the development of its nuclear power infrastructure, which will allow the country to make an early evaluation of the cost of the required infrastructure.

GP-10.1.1 Kenya has recognized the importance of capacity building in making a notable investment in the development of its human resources across a number of competence areas relevant for nuclear power. This has contributed to the quality of the activities undertaken in Phase 1 and will facilitate the implementation of Phase 2.

GP-11.1.1 Kenya undertook early public opinion polling to identify the main interests and concerns of stakeholders regarding nuclear power. This was used to guide the development of a comprehensive communications strategy, including activities, messages and preferred media.

6. EVALUATION RESULTS FOR PHASE 1

With respect to the INIR mission results, the following definitions are used:

Significant actions needed:

The “Review observations” indicates that there is considerable effort still needed to realize the stated “Condition”, and that achievement of this “Condition” is needed in order to be able to sustain overall progress in developing an effective national nuclear power infrastructure.

Minor actions needed:

The “Review observations” indicates that there is some effort still needed to realize the stated “Condition”. However, the current status, supported by the on-going activities, mostly achieves the desired “Condition”.

No actions needed:

The available evidence indicates that the intention underlying this “Condition” has been achieved. However, as work continues on the infrastructure knowledge and implementation, care has to be taken to ensure that this status remains valid.

Recommendations:

Recommendations are proposed when aspects related to fulfilment of conditions of nuclear infrastructure development are discrepant, incomplete or inadequately implemented. Recommendations are specific, realistic and designed to result in tangible improvement. Recommendations are based on the Milestones Approach and, as applicable, state the relation with the specific issue. The recommendations are formulated so they are succinct and self-explanatory.

Suggestions:

Suggestions may indicate areas where concrete plans exist and are being executed, or for useful improvement of existing programmes and to point out possible better alternatives to current work. In general, suggestions stimulate the management and staff to consider new or different approaches to develop infrastructure and enhance performance. Suggestions are formulated so they are succinct and self-explanatory.

Good practices:

A good practice is identified in recognition of an outstanding organization, arrangement, programme or performance, superior to those generally observed elsewhere. A good practice is more than just the fulfilment of the conditions or expectations. It is worthy of the attention of other countries involved in the development of nuclear infrastructure as a model in the drive for excellence.

It should be noted that the results summarized in the following tables neither validate the country actions and programmes, nor certify the quality and completeness of the work done by a country.

1. National Position	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
1.1. Safety, security and non-proliferation needs recognized		X	
1.2. NEPIO established and staffed	X		
1.3. National strategy defined			X
2. Nuclear Safety	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
2.1. Key elements of nuclear safety understood		X	
2.2. Support through international cooperation intended			X
3. Management	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
3.1. Commitment to management systems that promote and support a strong safety culture evident		X	
4. Funding and Financing	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
4.1 Strategies established for funding and financing	X		
5. Legislative Framework	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO

5.1. Adherence to all relevant international legal instruments planned		X	
5.2. Plans for national nuclear legislation in place	X		
5.3. Consultation with national stakeholders about the legislative framework			X
6. Safeguards	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
6.1. Terms of international safeguards agreement in place	X		
6.2. Development, implementation and enforcement of safeguards framework, including SSAC establishment, planned		X	
6.3. International requirements for any existing nuclear facilities or locations outside facilities met			X
7. Regulatory Framework	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
7.1. Development of an adequate regulatory framework planned	X		
8. Radiation Protection	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
8.1. Hazards presented by NPP operation recognized and enhancements to national regulations and infrastructures planned	X		
9. Electrical Grid	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
9.1. Electrical grid requirements considered			X

10. Human Resources	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
10.1. Necessary knowledge and skills identified and developed and maintenance of human resource base planned	X		
11. Stakeholder Involvement	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
11.1. Open and transparent stakeholder involvement programme initiated			X
12. Site and supporting facilities	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
12.1. General survey of potential sites, conducted and candidate sites identified		X	
13. Environmental Protection	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
13.1. Environmental framework and key issues for nuclear power outlined and environmental studies production and communication recognized			X
14. Emergency Planning	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
14.1. Appreciation of the need for emergency planning, developed and communication with and involvement of local and national government taken into account	X		
14.2. Emergency planning for existing radiation facilities and practices in place			X

15. Nuclear Security	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
15.1. Conditions for nuclear security acknowledged and necessary regulation identified	X		
15.2. Nuclear security arrangements for existing radiation facilities and practices in place			X
16. Nuclear Fuel Cycle	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
16.1. Knowledge of nuclear fuel cycle steps and approaches developed	X		
16.2. Need for site spent fuel storage recognized and away from reactor spent fuel storage considered			X
17. Radioactive Waste	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
17.1. The burdens of radioactive waste from nuclear power plants recognized and current capabilities for waste processing, storage and disposal reviewed	X		
17.2. Options for ultimate disposal of all radioactive waste categories recognized	X		
18. Industrial Involvement	Phase 1		
Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
18.1. National policy with respect to national and local industrial involvement considered	X		
18.2. Need for strict application of quality programmes for nuclear equipment and services recognized and consistent policies for nuclear procurement in place			X
19. Procurement	Phase 1		

Condition	Actions Needed		
	SIGNIFICANT	MINOR	NO
19.1. Unique criteria associated with purchasing nuclear equipment and services recognized		X	

ATTACHMENT 1: REVIEW OBSERVATIONS, RECOMMENDATIONS AND SUGGESTIONS FOR PHASE 1

1. National Position		Phase 1
Condition 1.1: Safety, security and non-proliferation needs recognized		
Summary of the condition to be demonstrated	Given its fundamental importance, there should be a clear statement that any development of nuclear power fully recognises the importance of safety, security and non-proliferation as well as evidence in the ongoing work programme. Even during Phase 1, when a decision may not have been made, the recognition of the importance of these aspects should be clear	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Evidence of a clearly stated government commitment. 2. Evidence of clear responsibilities for each issue with government co-ordination of activities. 	
Review observations		
<p>The SER identifies the international treaties and conventions that Kenya is already party to. It also refers to the fact that Kenya is in the process of ratifying several additional conventions related to the future nuclear power programme:</p> <ul style="list-style-type: none"> • Convention on Nuclear Safety; • Convention on Early Notification of a Nuclear Accident; • Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency; and • Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. <p>Similarly, the PFS explains that nuclear safety is a critical issue when starting a nuclear power project and identifies the next steps for ensuring nuclear safety, which include:</p> <ul style="list-style-type: none"> • Development of a National Policy and Strategy for Nuclear Safety; • Development of a National Nuclear Safety Knowledge Management Strategy; • Holistic Approach to Safety, Security and Safeguards; • Strategy for International Cooperation in Nuclear Safety; and • A Strategy for Increasing Public Knowledge on Nuclear Safety. <p>The final version of the National Policy and Strategy for Nuclear Safety, which was provided to the INIR team, proposes a roadmap to develop the nuclear safety infrastructure needed for the implementation of the programme. While it is still an internal KNEB document, it will be sent to stakeholders for comments and then to the Cabinet for endorsement.</p> <p>Nuclear security has also been recognized as demonstrated through the ratification of the relevant conventions and treaties, inter alia:</p>		

- The Convention on the Physical Protection of Nuclear Material and its Amendment; and
- International Convention for the Suppression of Acts of Nuclear Terrorism.

The INIR team was informed that a document defining policies and strategies for security, similar to the one developed for safety, is under development. This document will be sent to stakeholders for comments and then to the Cabinet for endorsement.

The INIR team considers that the policy and strategy documents, after endorsement by the Government, will provide guidance on some of the actions required for the establishment of adequate safety and security frameworks for the organizations involved in the nuclear power programme in Phase 2.

The PFS notes that Kenya is aware of its international safeguards obligations and that it has concluded a Comprehensive Safeguards Agreement (Modified Small Quantities Protocol) and Additional Protocol with the IAEA.

The draft Nuclear Regulatory Bill (2015) also acknowledges the importance of safety, security and non-proliferation (see also Issue 5 - Legislative Framework).

KNEB conducted several activities to familiarize stakeholders on the specific aspects of safety, security and safeguards of a nuclear power programme, including:

- A stakeholder involvement workshop in February 2014 with main stakeholders;
- Preparation of Frequently Asked Questions about nuclear, which was distributed to the public;
- Providing nuclear-familiarization training to individuals from other organizations; and
- Development of documents on safety, security, safeguards by Technical Working Groups that include participation of other organizations.

Areas for further action	Significant	No
	Minor	Endorsement of safety, security and non-proliferation policies

RECOMMENDATIONS

None

SUGGESTIONS

S-1.1.1 KNEB is encouraged to submit the policies and strategies for safety, security and non-proliferation to the Government for endorsement.

GOOD PRACTICES

None

Condition 1.2: The NEPIO established and staffed	Phase 1
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Summary of the condition to	It is essential that the Nuclear Energy Programme Implementing
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<p>be demonstrated</p>	<p>Organisation (NEPIO):</p> <ul style="list-style-type: none"> • has clear terms of reference which call for a comprehensive review of all the issues relevant to making a decision to proceed with a nuclear programme; • is recognised by all relevant ministries as having that role; • reports to a senior minister; • is staffed with appropriate resources(including budget for external support) and expertise; • Involves all relevant stakeholders, including the regulatory authority for radiation protection and future operators if already identified.
<p>Examples of how the condition may be demonstrated</p>	<ol style="list-style-type: none"> 1. The charter establishing the NEPIO and who it reports to. 2. Evidence that the roles and responsibilities of the NEPIO are known by all its members and by other government ministries. 3. The NEPIO is addressing an adequate scope of investigations and has clear definition of objectives and timescales. 4. A clear description of how the NEPIO operates in terms of funding, planning, reporting, scope of studies, use of consultants. 5. Evidence that the NEPIO has adequate skills to address all issues either directly or through commissioning specialist studies. 6. Evidence of relevant interactions between the Director of NEPIO and appropriate ministries such as those responsible for Energy, Environment, etc.
<p>Review observations</p> <p>The SER mentions that KNEB assumed the role of a Nuclear Energy Implementing Organization (NEPIO). KNEB is under the Ministry of Energy and Petroleum, reporting to the Cabinet Secretary and funded by the Government through the Ministry. KNEB works closely with other relevant stakeholders that include power utilities, national industry, academia, etc.</p> <p>The INIR team was informed that KNEB Board of Directors has membership drawn from various stakeholders. The Board includes the Ministries of Energy and Petroleum, Science and Technology, Education, Finance, and the Office of the Attorney General, as well as industry representatives. Furthermore, when KNEB considers crosscutting issues, the Ministry of Energy and Petroleum and Office of the Attorney General create a Technical Working Group (formal or ad hoc) to address the particular issue, which includes participation from the relevant agencies. However, in the area of legal and regulatory framework, the team noted that there are two laws being drafted. This fact indicates the need for stronger coordination among the different stakeholders.</p> <p>The Draft Energy and Petroleum Policy of January 2015, Section 23, notes that “the National Government shall (among other things) establish the Nuclear Energy Institute to promote and implement a nuclear electricity generation programme.” This policy will transform KNEB into the Nuclear Energy Institute, which will carry forward the mandate to manage the development of the nuclear power programme. The INIR team was informed that, in addition to retaining the role of the NEPIO, the Nuclear Energy Institute would also lead nuclear-related capacity building activities, as well as research and development on all forms of energy in Kenya.</p> <p>The INIR team noted that as the country determines whether to develop a nuclear power programme,</p>	

it will be important for Kenya to ensure effective coordination among all of the stakeholders, including the Radiation Protection Board, in order to take advantage of the existing competencies within the country. This coordination will also facilitate the decisions needed as the programme develops.		
Areas for further action	Significant	Coordination
	Minor	No
RECOMMENDATIONS		
R-1.2.1 Kenya should enhance coordination among the relevant stakeholders to support the development of the nuclear power programme.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		
Condition 1.3: National strategy defined. These also include 3 Management		Phase 1
Summary of the condition to be demonstrated	<p>The output for milestone 1 is a comprehensive report, defining and justifying the national strategy for nuclear power. This should include:</p> <ul style="list-style-type: none"> • analysis of energy demand, justification and compatibility of nuclear power (justification is Basic Safety Principle 4); • review of technologies to identify those that are consistent with the national requirements; • consideration of ownership options and operator responsibilities; • consideration of long term liabilities relating to spent fuel, radioactive waste and decommissioning; • consideration of the need for technical support organisations for the regulator and operator; • recognition that there remain a non-zero possibility of a severe accident and the need to deal with the consequences of such an accident will need to be addressed; • consideration of the demands of each of the infrastructure issues, including those for safety, security and non-proliferation, and a plan for how they will be met in the next phase of development. 	
Examples of how the condition may be	<ol style="list-style-type: none"> 1. List of the studies that are feeding into the report; current status and conclusions. 2. Contents list for the report. 	

demonstrated	3. Executive summary of the report.	
	4. Evidence of ministerial review of the report.	
Review observations		
<p>The SER mentions that the competitiveness of nuclear technology for power generation was analysed against other technologies in the Least Cost Power Development Plan using the Wien Automatic System Planning (WASP). The analysis demonstrated that nuclear power is a financially attractive option for Kenya's future power supply.</p> <p>The KNEB PFS, which was finalized in December 2013, is a well-structured document that presents the results of various studies related to the 19 Infrastructure Issues of the IAEA Milestones Approach.</p> <p>KNEB is currently conducting a preliminary assessment of the technologies available in the market, which is expected to be finalized by the end of this financial year (June 2016). This assessment will build on the initial review noted in the PFS, Chapter 3, and will provide additional information to Kenya related to the development of specific criteria for selecting a reactor type.</p> <p>In the evaluation of the possible ownership models, Kenya has analyzed different ownership options, but has not made a final decision. The issue of ownership is further considered under Issue 4 - Funding and Financing.</p> <p>The INIR team considers that an overall timeline for the development of the nuclear power programme would be useful going forward.</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
<p>GP-1.3.1 Kenya prepared a comprehensive prefeasibility study report, with strong national involvement, which considered all 19 infrastructure issues and provided clear recommendations for further action. This will assist the country in making a knowledgeable decision about the introduction of nuclear power.</p>		

2. Nuclear Safety		Phase 1
Condition 2.1: Key elements of nuclear safety understood		
Summary of the condition to be demonstrated	<p>The key requirements for nuclear safety, specified in international standards must be understood by the NEPIO and other relevant stakeholders, and their implications recognized.</p> <p>Note: Note that safety considerations need to include adequate consideration of nuclear security needs and vice versa.</p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Evidence that the NEPIO has an understanding of and commitment to the safety objective, including how they are taken into account in nuclear power of various design, and principles described in the IAEA Fundamental Safety Principles [3]. 2. Evidence that the prime responsibility for safety of the operator is recognized, for example in consideration of leadership, funding, expertise. 3. Recognition of the need to develop adequate capability and skills in nuclear safety. 4. Plans to ensure appointment of leaders with appropriate training and experience for the leadership and management of safety. 5. Recognition of the importance of safety culture in each of the organizations to be established. 6. Familiarity with IAEA safety standards and other States practices, and recognition of the need for and commitment to the development of national safety standards. 7. Recognition of the need to address the safety and security interface. 	
Review observations		
<p>KNEB has taken steps toward understanding and committing to the safety objectives for the construction and operation of nuclear facilities. The 15-year Strategic Plan performed a gap analysis and identified several areas that needed to be addressed. The KNEB has begun to address some of these gaps. For example, in May 2015 KNEB developed a draft “National Policy and Strategy for Safety for Kenya,” in which the government committed to develop provisions to ensure that facilities are operated and activities conducted to achieve the highest standards of safety. Kenya has also developed a draft document “Holistic Approach to Nuclear Safety, Security and Safeguards (3S),” March 2015, which addresses the safety, security and safeguards interfaces. The INIR team was informed that the next step will be for KNEB to share both documents with stakeholders that will be involved with the nuclear power programme.</p> <p>The “National Policy and Strategy for Safety for Kenya” also addressed the need for the government to develop provisions that ensure that the prime responsibility for safety must rest with the person or organizations responsible for the facilities and activities that give rise to radiation risks.</p> <p>While these documents stress the importance of safety culture, there will be a need to consider how safety culture will be fostered among the key organizations involved in the nuclear power</p>		

programme. In this regard, the INIR team was informed that Kenya has received some initial safety culture training through international workshops and expert meetings (e.g. with the United States and Republic of Korea). In addition, safety culture will be included in nuclear education programmes developed and implemented by the University of Nairobi.

While Kenya has initiated leadership training through a number of international courses (see Issue 3 - Management), it has yet to identify the potential senior leadership for the future key organizations. The INIR team noted that it will be important for the government to ensure that the leadership it selects has a strong understanding of the importance of safety and safety culture in accordance with IAEA Safety Standards.

Kenya has participated in some workshops and meetings to enhance the country's knowledge of the IAEA Safety Standards; however, no overall strategy exists for ensuring that the stakeholders involved in the nuclear power programme will have a thorough knowledge of the IAEA Safety Standards.

Areas for further action	Significant	No
	Minor	Nuclear safety

RECOMMENDATIONS

None

SUGGESTIONS

S-2.1.1 Kenya is encouraged to develop and implement a strategy to ensure the key stakeholders, including senior leaders, obtain a thorough knowledge of the IAEA Safety Standards and safety culture.

GOOD PRACTICES

None

Condition 2.2: Support through international cooperation intended	Phase 1
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Summary of the condition to be demonstrated	International co-operation and open exchange of information related to safety is an essential element of the Global Nuclear Safety Network. It needs to be demonstrated from the beginning.
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Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Evidence of review of options for bilateral or regional cooperation and specific actions for the selected co-operations started, especially with countries with an established nuclear programme. 2. Implementation of national technical cooperation programme with IAEA and evidence of Government financial support including safety aspects. 3. Specific plans for cooperation including safety aspects with other international organizations (World Association of Nuclear Operators
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	(WANO), nuclear regulators, universities, etc.).	
Review observations		
<p>Kenya is not yet a party to key nuclear conventions, in particular, the Convention on Nuclear Safety (see Issue 5 - Legislative Framework).</p> <p>The government is in the process of signing bilateral agreements with the United States, the Republic of Korea, Sweden and Slovakia to support the country's understanding of safety, security and safeguards related to nuclear power. Also, Kenya cooperates, through membership and/or endorsement, with various regional and international nuclear organizations to build capacity in its nuclear power program.</p> <p>Kenya has an established Technical Cooperation Programme with the IAEA to build capacity for its nuclear power program, and has received additional support through the IAEA Peaceful Uses Initiative. This cooperation includes programmes on building capacity and developing human resources, as well as the development of the legal and regulatory frameworks. Under these projects, Kenya has participated in a specialized training programme designed by the Nuclear Power Institute of Texas A&M University that included nuclear safety components.</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

3. Management		Phase 1
Condition 3.1: Commitment evident to management systems that promote and support a strong safety culture		
Summary of the condition to be demonstrated	Recognition of and commitment to leadership and management systems that will promote a strong safety culture.	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> Evidence that safety and security related activities conducted are included within the framework of an effective management system (e.g. site evaluation and environmental impact studies). Identification of appropriate leaders, demonstrating an attitude emphasizing safety and security culture. 	

	<ol style="list-style-type: none"> 3. Training and development of leaders. 4. A clear understanding of management system requirements. 5. A plan to implement management systems in future key organizations and understanding of the appropriate IAEA standards. 		
<p>Review observations</p> <p><i>Leadership</i></p> <p>Kenya has identified that training of senior managers, especially on nuclear safety culture and project management, is a key part of developing leaders and an integrated management system. Kenya has provided leadership training to two executives through the International Nuclear Leadership Education Program (INLEP), a program of the Massachusetts Institute of Technology and IAEA. While Kenya would like to send more executives to INLEP, this programme is currently on hold. Some management staff have also received training through the joint IAEA/Argonne National Laboratory on Leadership and Management for Introducing and Expanding Nuclear Power Programmes and will participate in the related Interregional Course on the Development of Integrated Management Systems.</p> <p>Kenya has also been a beneficiary of the IAEA/ International Centre for Theoretical Physics Nuclear Energy Management Schools. Four individuals have been trained in the Trieste based institute, while others have attended the Nuclear Energy Management Schools held in Tokaimura, Japan, and Abu Dhabi, UAE.</p> <p>While there are no specific plans for which posts these staff will hold in the programme going forward, it is expected that they will participate in the key organisations of the programme.</p> <p>The INIR team was informed that KNEB recognises the possibility and benefit of developing a national programme for nuclear power leadership, using a mix of national and international expertise.</p> <p><i>Management systems</i></p> <p>KNEB recognises that future key organisations in the nuclear power programme will require comprehensive management systems. Staff within KNEB’s Technical Department are looking at the requirements of management systems, but further consideration is required. The INIR team was also informed that KNEB is in the process of establishing an ISO based quality management system.</p> <p>KNEB recognises the need to identify and establish an owner/operator organization for the management of the nuclear power plant, and an independent regulator with technical competencies to safely regulate the nuclear sector. Both of these organisations will require management systems but there are currently no specific plans in place for how these organisations will be established. As KNEB or other designated entity develops Phase 2 studies (e.g. relating to siting and environment), it will need to ensure that such studies are undertaken under an appropriate management system.</p>			
Areas for further action	<table border="1"> <tr> <td>Significant</td> <td>No</td> </tr> </table>	Significant	No
Significant	No		

	Minor	Leadership training Management systems
RECOMMENDATIONS		
None		
SUGGESTIONS		
<p>S-3.1.1 KNEB is encouraged to develop a national nuclear power leadership programme.</p> <p>S-3.1.2 KNEB is encouraged to broaden its knowledge of management system requirements, including relevant IAEA requirements and guidance, for key organisations.</p>		
GOOD PRACTICES		
None		

4. Funding and Financing		Phase 1
Condition 4.1: Strategies for funding and financing established		
Summary of the condition to be demonstrated	<p>Establish how a range of key activities that are specific to a NPP (including items that may not be the fiscal responsibility of the owner/operator) will be funded, taking into consideration the various possible sources of funding. They include:</p> <ul style="list-style-type: none"> a) the regulatory body for safety and security; b) safeguards arrangements; c) education, training and research; d) storage and disposal of radioactive waste; e) management of spent fuel including spent fuel/high level waste disposal; f) decommissioning. <p>Identify financial and strategic planning measures and risk management strategies, which together create sufficient confidence for investors to support an NPP project and ensure the long term viability of the operating organisation to effectively fulfil all its responsibilities. A large part of government's role in nuclear power financing, if the government is not directly a sponsor of the project, revolves around risk reduction.</p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Clear statements of how the above conditions will be met, based on consideration of options. 2. Evidence that the scale of the costs of each of these activities has been recognised. 3. A review of financing options and risk management strategies, considering the long term economics and risks associated with the NPP. This should include the extent of government funding, equity 	

Review observations

Funding

The PFS recognises that the Government, through its ministries, is required to make provisions to fund the following activities:

- Establishment of a nuclear regulatory body, a regulatory system and a nuclear safety training institute;
- EPR arrangements including a national radiological emergencies coordinating authority;
- Development of a Nuclear Energy Bill and nuclear energy policies;
- Grid assessment and improvement;
- Training of staff;
- Information centres and stakeholder engagement;
- Site characterization;
- Environmental assessment;
- Development of DBT and cyber security;
- Safeguards;
- Development of a TSO; and
- Supporting industrial involvement.

The PFS also recommends that further studies should be conducted to estimate the costs for activities during the decision-making stage of nuclear power programme development. KNEB plans to carry out such studies during the current financial year, ending 31 May 2016. At this stage, no further information is available. In general these activities will be funded as part of the current budgeting process for government departments. Kenya is committed to funding projects that are consistent with its Vision 2030 and Least Cost Power Development Plan.

With respect to the budget of the regulatory body, KNEB stated that estimates of this are awaiting decisions on how the regulatory body will be established, particularly with respect to the role of the existing Radiation Protection Board. Initial funding is expected to be obtained directly from the government, but further work will be done to consider how licensee fees will be defined and used. Currently, the Radiation Protection Board receives 80% of its budget directly from the government with the remainder coming from levies.

The PFS notes that the costs of the treatment, storage and disposal of radioactive waste, as well the management of spent fuel, still need to be estimated and funding arrangements for these activities need to be established. The draft Nuclear Regulatory Bill (2015) contains provisions related to the establishment of a fund for decommissioning and waste management, but detailed options for how this will be accomplished are not yet finalised.

Financing

The PFS contains some discussion of NPP costs but concludes that further studies should be conducted to provide revised cost estimates that reflect the impacts of factors such as siting, localization rate and fluctuations in foreign exchange rates. KNEB plans to conduct further studies on the cost estimates of the nuclear power plant in the 2016-2017 financial year.

The PFS also discusses the range of financing options available in general but does not provide any financing models specific to Kenya. It notes that Kenya is unlikely to provide significant equity to the project.

KNEB has not currently developed any financing models that look at the feasibility of different options but has plans to conduct this work in the 2015-2016 financial year.

While the detailed cost of financing will depend on the potential role and expectations of a strategic partner, the INIR team considers that further work needs to be done to identify feasible options for Kenya in order to inform future negotiations.

There are a number of financial risks that Kenya needs to consider and current work has identified the main risks but no mitigations to control these risks. The INIR team noted that financial risks should be considered as part of the financing model process.

Areas for further action	Significant	Estimation of funding requirements Consideration of feasible financing models
	Minor	No

RECOMMENDATIONS

R-4.1.1 KNEB should complete its work to estimate the order of magnitude cost of developing the major elements of nuclear infrastructure in order to inform the Government of future budgetary requirements.

R-4.1.2 KNEB should conduct financial modelling to inform the Government on potential financing and ownership options.

SUGGESTIONS

None

GOOD PRACTICES

GP-4.1.1 Kenya has identified the activities that need to be funded for the development of its nuclear power infrastructure, which will allow the country to make an early evaluation of the cost of the required infrastructure.

5. Legislative Framework	Phase 1
Condition 5.1: Adherence to all relevant international legal instruments planned	

<p>Summary of the condition to be demonstrated</p>	<p>An understanding of the requirements of international legal instruments, the implications for the country and a commitment to adhere. As a minimum, the following instruments should be covered:</p> <ul style="list-style-type: none"> 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 Material and its Amendment; f) Vienna Convention on Civil Liability for Nuclear Damage, 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; h) Revised Supplementary Agreement concerning the provision of Technical Assistance by the IAEA. <p>Note: The IAEA encourages Member States to consider concluding the Additional Protocol</p>
<p>Examples of how the condition may be demonstrated</p>	<ul style="list-style-type: none"> 1. Plans for when each of the instruments will be adhered to. 2. Identification of the actions that will need to be undertaken. 3. Understanding and identifying the resources required.
<p>Review observations</p> <p>Kenya has already ratified the relevant international legal instruments dealing with nuclear security, and has a Comprehensive Safeguards Agreement and Additional Protocol in place. A Technical Working Group under the Ad Hoc Inter-Ministerial Committee for the Development of a Legal and Regulatory Framework for Nuclear Energy is leading the process for studying and moving forward with adherence to the other relevant international legal instruments. namely the:</p> <ul style="list-style-type: none"> 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) Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage; and f) Convention on Supplementary Compensation for Nuclear Damage. <p>The TWG has prepared a position paper on the implications and requirements for Kenya for joining these instruments.</p> <p>Kenya stated that it has prioritized ratification of the four international legal instruments on nuclear safety ([a] to [d] above). Pursuant to the requirements of Kenya’s Treaty Making and Ratification Act</p>	

of 2012, the lead Ministries have prepared draft Cabinet memoranda for each of the four legal instruments for presentation to the Cabinet for approval, and eventual submission to Parliament.

In the area of civil liability for nuclear damage, Kenya is considering ratifying the Vienna Convention on Civil Liability for Nuclear Damage and the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, as well as the Convention on Supplementary Compensation for Nuclear Damage. It is also considering to join the Optional Protocol concerning the Compulsory Settlement of Disputes to the Vienna Convention on Civil Liability for Nuclear Damage, the Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention (1988 Joint Protocol), and the Convention relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material.

Kenya has also identified the challenges for completing the ratification process including inter alia, logistical challenges (i.e. timing), financial implications and public consultations. The ratification process has been ongoing for some time. The INIR team was informed that Kenya aims to complete it by 2017.

Areas for further action	Significant	No
	Minor	Ratification of conventions

RECOMMENDATIONS

None

SUGGESTIONS

S-5.1.1 Kenya is encouraged to complete the early ratification of the conventions in the area of nuclear safety which it has identified as a priority.

GOOD PRACTICES

None

Condition 5.2: Plans for development of national nuclear legislation in place

Phase 1

Summary of the condition to be demonstrated

An understanding of what legislation needs to be established, the timescales for its development and approval, together with a commitment from government to achieve the stated plan which should cover:

- a) establishing an effectively independent regulatory body and a regulatory control system (licensing, inspection and enforcement) for safety and security (see also Issues 7 and 15);
- b) formulating nuclear safety, radiation safety and nuclear security principles, policies and rules (nuclear installations, radioactive waste management and spent fuel, decommissioning, mining and milling, emergency preparedness, transport of radioactive material) (see also Issues 2, 8 and 15);
- c) Designation of a competent authority for threat assessment;

	<ul style="list-style-type: none"> d) implementing IAEA safeguards including a State System on Accounting for and Control of Nuclear Materials (SSAC) - see also Issue 6; e) implementing import and export controls of nuclear material and items; f) establishing compensation mechanisms for nuclear damage. <p>Further detail is available in the IAEA Handbook on Nuclear Law (2003 and 2010)</p> <p>The other legislation to be considered includes:</p> <ul style="list-style-type: none"> a) environmental protection (air and water quality and wildlife protection); b) emergency preparedness and management for natural disasters; c) occupational health and safety of workers; d) protection of intellectual property; e) local land use controls; f) international trade and customs; g) foreign investment ; h) taxation: tax of electricity tariff (e.g. for decommissioning funds),and incentives; i) roles of national government, local government; j) stakeholders and public involvement; k) international trade and customs; l) financial guarantees and other required financial legislation; m) research and development.
<p>Examples of how the condition may be demonstrated</p>	<ol style="list-style-type: none"> 1. A plan of how the legislation will be developed and approved. 2. A summary of how each of the areas listed above will be addressed within proposed legislation. 3. Interactions with IAEA and the other relevant organisations.
<p>Review observations</p> <p>Kenya has established the Ad Hoc Inter-Ministerial Committee on the Development of a Legal and Regulatory Framework for Nuclear Energy in Kenya.</p> <p>Kenya is in the process of drafting the Nuclear Regulatory Bill, which is intended to be a comprehensive nuclear law covering nuclear safety, security, safeguards, and civil liability for nuclear damage, and provides, inter alia, for the establishment of the Kenya Nuclear Regulatory Commission which shall exercise regulatory control over “siting, design, construction, operation, manufacture of component parts, waste management and decommissioning of nuclear and other facilities; nuclear materials and facilities; and any other activities which the Commission may seek to exercise regulatory control over through granting authorizations (licensing), renewal, modification, suspension, revocation and a system of notifications.” The draft Bill includes provisions on radiation protection. Under its terms of reference, the Technical Working Group that was established under the Inter-Ministerial Committee is tasked with developing the draft Nuclear Regulatory Bill.</p> <p>However, at the same time, Kenya is also in the process of reviewing the Radiation Protection Act (Chapter 243), which sets forth the current legal framework for radiation protection and radiation safety and established the Radiation Protection Board (RPB) upon its entry into force in 1984. The</p>	

RPB has prepared the draft Nuclear and Radiation Safety Bill which will repeal the existing Act and establish a Nuclear and Radiation Safety Authority which shall be the successor of RPB and have regulatory authority over nuclear material and facilities apart from radioactive materials and radiation sources. RPB stated that as the incumbent regulator in Kenya, it commenced work to address the challenges that will be posed by a nuclear power program in revising the current Radiation Protection Act.

Both tracks are moving forward, and there are clear areas of overlap between the provisions of the two draft Bills. Kenya informed the INIR team that this overlap would be resolved and the necessary legislation would be presented to Parliament for enactment.

Kenya informed the INIR team that it was still in the process of considering whether it will establish one or two regulatory bodies.

The INIR team noted that it is important for Kenya to decide whether it will enact a single comprehensive law, or have two separate laws establishing two regulatory bodies with separate authority over nuclear material and facilities and radiation sources, respectively. A number of key infrastructure issues will be impacted by this decision.

The INIR team noted that should Kenya decide to have two regulatory bodies it will be essential to clearly define their respective regulatory functions to avoid any overlap between the scope of authority of the future regulatory entities.

In 2015, Kenya also started a legal audit that aims to look at other existing national laws relevant to the nuclear power program. The Technical Working Group is working together with the State Law Office to ensure that all relevant laws are reviewed and considered. Kenya has yet to complete this review to determine any inconsistency with the draft Nuclear Regulatory Bill. It is important that Kenya undertake this process alongside the development of a comprehensive nuclear law to ascertain any inconsistency with existing legislation.

Areas for further action	Significant	Clarification of the legislative framework Comprehensive review of existing national laws
	Minor	No

RECOMMENDATIONS

R-5.2.1 Kenya should finalize a single Bill to cover all nuclear regulatory matters, and determine its approach for regulatory oversight of the nuclear power programme.

R-5.2.2 Kenya should complete the process for reviewing all relevant laws that need to be considered in relation to its nuclear power program.

SUGGESTIONS

None

GOOD PRACTICES

None

Condition 5.3: Consultation with national stakeholders about the legislative framework taken place		Phase 1
Summary of the condition to be demonstrated	Effective stakeholder engagement and an on-going plan.	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. An explanation of the stakeholders that have been identified. 2. Evidence that stakeholder consultation is included in the plans for developing and approving legislation. 	
Review observations		
<p>The draft Nuclear Regulatory Bill 2015 is being developed in consultation with key local stakeholders through the Technical Working Group, established under the Ad Hoc Inter-Ministerial Committee on the Development of a Legal and Regulatory Framework for Nuclear Energy in Kenya. The Ad Hoc Inter-Ministerial Committee draws from key stakeholders from various Government Ministries, including the Office of the Attorney General. The terms of reference of the Technical Working Group includes the mandate to develop draft nuclear legislation as well as to conduct a legal audit of all legislation relevant to a nuclear power program. The Technical Working Group on Legislative Framework includes participation from the following organizations:</p> <ul style="list-style-type: none"> • Ministry of Energy & Petroleum; • Ministry of Education; • National Commission for Science & Technology; • Office of the Attorney General; • Ministry of Health; • Ministry of Agriculture; • Ministry of Environment & Natural Resources; • Ministry of Foreign Affairs; • Radiation Protection Board; and • Kenya Nuclear Electricity Board. <p>The National Treasury Office is also consulted on the financial implications of the draft Bill and adherence to the relevant international legal instruments on nuclear safety and civil liability for nuclear damage. Public consultations on all draft legislation are also conducted six months before final adoption.</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		

None
GOOD PRACTICES
None

6. Safeguards		Phase 1
Condition 6.1: Terms of international safeguards agreement in place		
Summary of the condition to be demonstrated	<p>The Comprehensive Safeguards Agreement with associated Subsidiary Arrangements is in force with the IAEA.</p> <p>If the State currently has a Small Quantity Protocol (SQP) in force, a plan for rescinding the protocol in a timely manner is in place.</p> <p>The State is aware of the obligations of the Additional Protocol (AP) and, if it intends to ratify and has not already done so, a plan is in place for timely ratification.</p>	
Examples of how the condition may be demonstrated	<p>A plan covering the SQP and AP has been prepared.</p>	
Review observations		
<p>Kenya has made significant steps in acceding to international legal instruments on nuclear non-proliferation. In particular, Kenya is party to:</p> <ul style="list-style-type: none"> • Treaty on Non-Proliferation of Nuclear Weapons (NPT), since 2009; • African Nuclear-Weapon-Free Zone Treaty (Pelindaba Treaty), since 2000; • Comprehensive Nuclear-Test-Ban Treaty (CTBT), since 2000; and • Partial Test Ban Treaty 1963 (PTBT), since 1965. <p>Since 2009, Kenya also has the following in force with the IAEA:</p> <ul style="list-style-type: none"> • Comprehensive Safeguards Agreement (CSA) with Small Quantity Protocol Modified (SQP); • Protocol Additional to the CSA (AP). <p>Since Kenya is a State with SQP (still in force), the obligation of concluding the associated Subsidiary Arrangements (SA) is kept in abeyance.</p> <p>Kenya is aware that the SQP will be rescinded upon the decision of the country to construct or authorize the construction of a nuclear facility. However, Kenya has no plan for rescinding the SQP in a timely manner, nor a clear understanding of the necessary steps and associated consequences of this process. Kenya stated that it needs to be guided on these issues, and will seek advice from the Agency.</p>		

Areas for further action	Significant	Plan for rescinding Small Quantities Protocol
	Minor	No
RECOMMENDATIONS		
R-6.1.1 Kenya should plan for rescinding its Small Quantities Protocol in a timely manner.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		
Condition 6.2: Development, implementation and enforcement of safeguards framework, including SSAC establishment, planned		Phase 1
Summary of the condition to be demonstrated	The State System on Accounting for and Control of Nuclear Materials (SSAC) has been established as required under the Comprehensive Safeguards Agreement.	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. The NEPIO includes a representative from the SSAC. 2. A plan produced by the NEPIO covering the enforcement of national legislation, policies and procedures relevant to safeguards. (NB The development of the legislation itself is covered under Issue 5). 	
Review observations		
<p>Currently, all safeguards related functions in Kenya, including the establishment and maintenance of the State System on Accounting for and Control of Nuclear Materials (SSAC), are assigned to the Radiation Protection Board (RPB).</p> <p>Kenya submits reports on nuclear material and accounts, and reports on the nuclear material international transfers and installations in the country to the IAEA on an annual or quarterly basis, as applicable. Three visits of IAEA safeguards inspectors have been conducted in Kenya.</p> <p>The INIR team was informed that RPB participated in the following training courses:</p> <ul style="list-style-type: none"> • Two individuals attended the joint IAEA-United States International Training Course on SSAC; • Two other individuals attended the IAEA Regional African Training Course on SSAC; • One individual participated in the 10 month IAEA Traineeship Programme and served as an IAEA safeguards inspector for 7 years, before returning to Kenya. <p>If Kenya decides to construct a nuclear power plant, significant steps need to be undertaken to expand and enhance its SSAC in order to fulfil all of the obligations and requirements contained in its</p>		

Comprehensive Safeguards Agreement.

Kenya has three points of contact for safeguards in two entities; two points of contact are from the RPB and one point of contact is from the Ministry of Foreign Affairs.

The INIR team was informed that the decision on the number of required personnel as well as their training programme is contingent on the country's decision about the establishment of its future regulatory body/bodies.

Areas for further action	Significant	No
	Minor	Plan for enhancing the SSAC

RECOMMENDATIONS

None

SUGGESTIONS

S-6.2.1 Kenya is encouraged to develop a plan for enhancing the SSAC.

GOOD PRACTICES

None

Condition 6.3: International requirements for any existing nuclear facilities or locations outside facilities met	Phase 1
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Summary of the condition to be demonstrated	It is clearly a requirement to meet existing safeguards obligations, independent of any decision to begin a nuclear power programme. However, if any reviews or audits have been undertaken of the existing safeguards provisions, there should be evidence that the actions resulting from it are being progressed. (It is probably more appropriate to review this in detail during Phase 2).
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Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Presentation of any action plans resulting from a review/audit with progress identified. 2. 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.
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Review observations

RPB requires that all the operators and owners of nuclear material and/or radiation sources report on their installations and materials. The operators must obtain an import/export license from RPB and should file quarterly and annual reports on all their installation and activities, as applicable.

RPB also conducts inspections to verify the correctness and completeness of the materials accounted for by the operators in Kenya.

<p>A review of safeguards approaches of other countries, including South Africa, France, Sweden, United States and Republic of Korea was undertaken and recommendations were made to identify and incorporate good practices of these countries in Kenya's planned nuclear power programme in the area of safeguards.</p> <p>No reviews or audits have been undertaken with regard to the existing safeguards provisions.</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

7. Regulatory Framework		Phase 1
Condition 7.1: Development of an adequate regulatory framework planned		
Summary of the condition to be demonstrated	<p>As work to establish the regulatory body will need to take place early in Phase 2; the prospective senior managers of the regulatory body should be identified in Phase 1. There should also be plans to develop a regulatory framework that matches the overall plan for the NPP, including:</p> <ul style="list-style-type: none"> • establishment of an authorization process; • development of regulations and guides covering nuclear and radiation safety and security; • process and capability for technical review; • regulation of safeguards requirements; • regulation of spent fuel, radioactive waste management and decommissioning; • inspection and enforcement capability; • coordination with other national and international bodies; • plans to identify and ensure the required technical support. <p>There should be clarity of the terms of reference of the regulator and the roles of and interfaces with existing regulators.</p> <p>Recognition of the need for integrating radiation protection regulations and new safety regulations for nuclear power plants.</p>	
Examples of how the	1. Identification of senior regulators and what has been done to	

condition may be demonstrated	<p>develop their experience.</p> <ol style="list-style-type: none"> 2. Any proposals on the approach to licensing, safety assessment etc. 3. Plans to develop the regulatory body(-ies) for safety and security. 4. Definition of the terms of reference of each proposed regulatory organisation addressing possible interfaces and roles in licensing (particularly environmental issues). 5. Evidence of interaction and co-operation with established regulatory organisations. 6. Plans to enhance or develop appropriate technical support organisations (see also issue 10) to regulatory body. 7. Plans to secure support from other organisations.
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Review observations

Kenya currently has an experienced regulatory body, the Radiation Protection Board, which is responsible for overseeing the use of radiation sources, addressing radiation safety, nuclear security, and safeguards.

As discussed under Issue 5 - Legislative Framework, Kenya has draft a Nuclear Regulatory Bill (2015) that will establish a new independent nuclear regulator, once enacted. This law will empower the regulator to issue regulations. KNEB is responsible for the initial planning to establish a regulatory framework. However, KNEB indicated that it is waiting for the draft bill to be enacted before initiating any significant plans to address important regulatory functions (e.g. the establishment of an authorization process and the development of regulations and guides).

KNEB has performed some benchmarking of established regulatory bodies to identify regulatory approaches that could be implemented by Kenya, including the United States, Republic of Korea, and Brazil. In addition, Kenya has entered into Memoranda of Understanding with some of these and other governments to provide future assistance in the development of its regulatory body once established.

Kenya has initiated senior leadership training through a variety of international opportunities (See also Issue 3 - Management), but has not identified prospective senior managers for the future regulatory body (see also Issue 2 - Nuclear Safety).

The INIR team was informed that Kenya has initiated some preliminary efforts to identify the resources and competencies for the regulatory body, particularly those needed for Phase 2. In addition, Kenya has initiated actions to seek the services of a technical support organization to provide assistance with the regulatory oversight process.

Areas for further action	Significant	Development of the regulatory framework and required resources Senior leadership for the regulatory body
	Minor	No

RECOMMENDATIONS

R-7.1.1 Kenya should plan the activities to be undertaken by the future regulatory body for early

Phase 2 and identify the resources and external technical support necessary.
R-7.1.2 Kenya should identify the potential senior leaders for the future regulatory body.
SUGGESTIONS
None
GOOD PRACTICES
None

8. Radiation Protection		Phase 1
Condition 8.1: Hazards presented by NPP operation recognised, and enhancements to national regulations and infrastructures planned		
Summary of the condition to be demonstrated	<p>There is probably an existing radiation protection programme associated with radiation sources. The condition is to identify how the existing programme will need to be enhanced (both in scale and to cover new technical issues) to address hazards arising from NPP operation (including transport of radioactive materials and waste management) and to begin to consider how the required enhancements will be delivered. (This latter point is more of an issue for Phase 2).</p> <p><i>This issue is closely linked to Issue 7. In particular, the development of regulations and issue of whether the existing regulatory body will expand its role or whether the issues will be addressed by a separate organisation is covered in Issue 7.</i></p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Evidence of interactions with specialists from other countries. 2. Plans for who will be responsible for the main elements of a radiation protection programme. 	
Review observations		
<p>The current radiation protection legal framework in Kenya is contained in the Radiation Protection Act (1984) and Radiation Protection (Safety) Regulations (2010).</p> <p>The Radiation Protection Act established the Radiation Protection Board (RPB) which was institutionalized as a Semi-Autonomous Government Authority in 1986 under the Ministry of Health.</p> <p>While there is no formal plan for enhancing the current radiation protection programme and infrastructure to support a nuclear power plant, Kenya has taken some initial actions, especially related to the development of additional human resources.</p> <p>The country has some existing infrastructure that can be used for the nuclear programme (e.g. dosimetry system and a secondary lab) and Kenya expects to soon have a standards lab operational. The next step will be the identification of equipment (i.e. neutron dosimeters) and the rest of radiation</p>		

protection infrastructure needed.		
The RPB has interactions with organizations and specialists from other countries through IAEA meetings and workshops. The RPB also participates in the Forum for Nuclear Regulatory Bodies in Africa and has interactions with U.S. Nuclear Regulatory Commission experts and with experts from the countries where Kenyan professionals are trained, such as the Republic of Korea, China, etc.		
Areas for further action	Significant	Radiation protection programme enhancement
	Minor	No
RECOMMENDATIONS		
R-8.1.1 Kenya should identify how the existing radiation protection programme will be enhanced to address the requirements related to nuclear power.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

9. Electrical Grid		Phase 1
Condition 9.1: Electrical grid requirements considered		
Summary of the condition to be demonstrated	<p>There are a number of criteria related to the grid:</p> <ul style="list-style-type: none"> • The grid needs to be able to withstand loss of the output; • The grid needs to be reliable to take the output from the NPP as a base load; • The grid needs to be reliable to minimise demand on on-site supplies. <p>The potential impacts of the reliability of the national power grid on the design requirements for the safety of the plant should be considered.</p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. An analysis of the grid covering: <ol style="list-style-type: none"> a. the expected grid capacity b. the historical stability and reliability of the electrical grid c. the historical and projected variation in energy demand. 2. Consideration of available NPP designs to identify those with output consistent with required grid performance and reliability, with due consideration taken for safety aspects. 3. Potential location of the NPP and its behaviour with respect to grid operation. 4. The potential for local or regional interconnectors to improve the grid characteristics. 	

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| | <p>5. Identified actions to enhance the grid to meet the NPP requirements.</p> <p>6. Identification of independent grids for input and output of power</p> |
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Review observations

Kenya has contracted an electric grid consultant to undertake a complete technical analysis of the current Kenyan electric grid to support the inclusion of a nuclear power plant. This consultancy service will take into consideration the key requirements for the inclusion of the nuclear power plant into the country's grid. The tasks include:

- Analysis of the reliability and improvement of grid stability;
- Developing plans to ensure sufficient reserve capacity;
- Develop plans for off-site NPP supplies; and
- Modelling of nuclear power plant integration into the grid.

KNEB explained that the work was progressing well and that a 1st interim report was provided in July 2015. The work is on track to deliver a final report in January 2016. The work is being reviewed by a multi-organisational team with representatives from the transmission, distribution and generation companies.

The government has created an initiative to increase the existing national installed capacity to more than 6700 MW by December 2016. The main objectives of this initiative are to:

- Address the current suppressed power demand;
- Provide a 30% reserve margin;
- Support power energy intensive activities in the country;
- Power electrification of rail lines and new economic zones.

Based on the Government's plan to have nationwide access to electricity by the year 2020, the flagship projects, the projected GDP growth driven mainly by county investments, industrial parks and other key strategic investments, the load forecast shows capacity requirements growing from a peak of 1463 MW in 2013 to 9642 MW in 2024 under the fast-tracked Vision 2030 growth scenario.

KenGen explained that the work to increase electricity generation was progressing as planned. Several new generation plants have come on line in the last two years. Most of the planned projects have already progressed beyond financial closure and the work is now committed. The basis of the original plan to bring nuclear on line in 2022 was that the generation capacity would be sufficient to support the installation of a NPP.

The Government, through KETRACO, will construct over 4000 km of high voltage transmission infrastructure comprising of lines, switch gears and sub-stations across the country over the next 3-4 years, at an estimated cost of US \$ 1.3 billion.

Using the Least Cost Power Development Plan, a transmission system plan was developed for the period beginning 2014 to 2024. The transmission development plan indicates the need to develop approximately 8000 km of new lines at an approximated present value cost of US \$ 3.09 billion. A

further US \$ 80 Million will be required to address sub-station requirements.

The Kenyan and Ugandan power grids have been interconnected for over 50 years through a 132 kV double circuit power line. A second double circuit interconnector at 400 kV is being implemented under the Nile Equatorial Lakes Subsidiary Action Program.

A Kenyan and Tanzanian interconnection is also expected in the next three years through a proposed 400 kV from Isinya substation south of Nairobi to Arusha before terminating at Singinda in Tanzania. The line would have a power transfer capacity of at least 1000 MW.

Ethiopia and Kenya are also implementing a 1100 km long interconnection, 500 kV DC transmission line, with a power transfer capacity of 2000 MW.

KETRACO explained that the transmission enhancements were also progressing well, and that updates of the planned projects are provided annually.

Areas for further action	Significant	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

10. Human Resources	Phase 1
Condition 10.1: Necessary knowledge and skills identified, and development and maintenance of human resource base planned	

Summary of the condition to be demonstrated	<p>There needs to be an integrated approach to human resource (HR) development across all organisations. A national strategy needs to consider:</p> <ul style="list-style-type: none"> • assessment of current national institutional and human resource capacity and education programmes including the additional education, competences and skills that will be required (gap analysis); • how appropriate staff will be attracted, trained and retained; • what centres and programmes need to be established for education and training; • what research capability needs to be developed;
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	<ul style="list-style-type: none"> • a senior leaders development programme. <p>At this stage, this should be an integrated plan that can be developed, in a co-ordinated way, into plans for each organisation.</p>
<p>Examples of how the condition may be demonstrated</p>	<ol style="list-style-type: none"> 1. An analysis identifying the competences and numbers needed, covering all the future organizations. The analysis should include: <ol style="list-style-type: none"> 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 NPPs); d) the HR that are available in key stakeholder organizations; e) the HR that are expected to be recruited/developed nationally. 2. Plans to develop the HR required including: <ol style="list-style-type: none"> a) Identification of national organizations which could support HR development; b) any required enhancement of education and training infrastructure; c) the external HR that are needed to augment national resources and how they will be secured; d) the development and training of national competence (through schools, universities, institutes, industry); 3. The need for support from a vendor country and any specific training programmes with vendors. 4. How national training capability will be developed (training the Trainers), using vendor support as appropriate, to ensure sustainability of national ‘pipeline’. 5. How trained staff will be retained, addressing both the competition from other markets/organizations and the impact of project delays. 6. Strategies for developing an appropriate safety and security culture and management in each of the future organizations. 7. Proposals for qualification and certification of key staff. 8. Evidence that key stakeholder organisations have participated in the development and review of the plans.
<p>Review observations</p> <p>The Ministry of Education, Science and Technology (MEST) has the responsibility for setting policy in all areas of science, technology and innovation, consistent with the goals of Kenya’s Vision 2030. It creates and implements Medium Term Development plans to support the policy (currently in the second plan: 2013-2017). As part of this plan it has surveyed the education and training system with respect to its capability to support the various elements of Vision 2030, including the nuclear power programme. In order to bridge the gaps identified, three actions were highlighted: 1) the government will create and fund an independent Nuclear Research Centre; 2) the University of Nairobi is developing Masters and PhD programmes in Nuclear Science, and will develop a BSc in Nuclear Engineering with the assistance of Texas A&M University (TAMU); and 3) other universities and training institutions are being encouraged to develop programmes, such as environmental management and engineering, tailored to nuclear power.</p> <p>The INIR team was also informed that agreements exist or are being developed, with Republic of</p>	

Korea, Russian Federation, Slovak Republic, Sweden, TAMU and the U.S. Nuclear Regulatory Commission, which include support for capacity building.

Through the support of MEST, the Kenya Power and Light Company training school was further enhanced to train technicians for positions across the energy sector.

As part of the PFS, Kenya has conducted studies to identify the knowledge and skills necessary to purchase, operate, maintain and regulate a nuclear power plant. These demonstrate a clear understanding of the many requirements both in terms of technical specialisations and levels of qualification.

A draft Capacity Building (CB) Strategy document has been developed, which estimates the human resource (HR) needs, associated competencies and training requirements. However there are some inconsistencies between the numbers in different parts of this document, as well as with the numbers quoted in the SER. In addition, the draft only addresses the needs of the operating organisation and the regulatory body and lacks details on how, when and from where the necessary HR will be recruited, trained and retained.

Based on feedback on the draft CB document from the IAEA, Kenya has recognised the need to engage a broader range of stakeholders to ensure all the involved organisations and skills needs are addressed. It has decided to form a new team to further develop the document and is in the process of developing the terms of reference.

It is planned that the new document, which is targeted to be available within a year, will also address how Kenya will achieve the human resource needs and associated funding and qualification requirements. KNEB is also introducing the IAEA workforce planning tool to a wide range of stakeholders to gain a broader understanding of the workforce needs.

Kenya has been proactive in capacity building for nuclear power, having sent more than 50 individuals from KNEB and various ministries to TAMU for tailored nuclear education programmes, as well as utilizing other international opportunities. A number of fellowships and other training opportunities have focused on the regulatory and legal areas.

Kenya also recognises the importance of gaining real experience after the educational component and the INIR team shared their experience in getting opportunities with countries operating nuclear power plants.

Areas for further action	Significant	National strategy for human resource development
	Minor	No

RECOMMENDATIONS

R-10.1.1 Kenya should further develop its national human resource development strategy for the nuclear power programme, including planning for Phase 2.

SUGGESTIONS

None

GOOD PRACTICES

GP-10.1.1 Kenya has recognized the importance of capacity building in making a notable investment in the development of its human resources across a number of competence areas relevant for nuclear power. This has contributed to the quality of the activities undertaken in Phase 1 and will facilitate the implementation of Phase 2.

11. Stakeholder Involvement		Phase 1
Condition 11.1: Open and transparent stakeholder involvement programme initiated		
Summary of the condition to be demonstrated	Stakeholder involvement plans should be developed by the NEPIO. The public and other relevant interested parties should be informed about nuclear technology and, in particular, nuclear power, its benefits and risks, including the ‘non-zero’ potential for severe accidents, to facilitate stakeholder involvement based on transparency and openness.	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Actions to disseminate information in the context of the national energy outlook, policy and needs, pros and cons of all sources of energy. 2. Identified effective tools to explain the reasons for the government interest in, and the societal benefits and risks resulting from the use of nuclear power. 3. Approaches to address public concerns about severe accidents covering, low likelihood, response plans and consequences. 4. Initiated activities at local, regional and national level. 5. Initiated public communication programmes by the regulatory body (if in place), to clarify its role and demonstrate expertise and independence. 6. A plan for interaction with the public, in particular opinion leaders, media, local and national governmental officials, neighboring countries. 7. Established plans for regular opinion polls managed by professional companies. 8. Training programme to enable identified spokespersons to interact with stakeholders. 9. Evidence of meetings held with key stakeholder groups and a plan of follow up actions and meetings. 10. Authorities’ decisions are transparent and made accessible to the public, including information about the public participation process itself. 11. Included in the establishment of educational programmes activities of engagement with teachers, local officials, students and their families. 	
Review observations		
KNEB has developed a comprehensive Communications Strategy, which identifies different stakeholder categories, their different information needs and strategic communication approaches.		

Some initial public opinion polling was conducted to determine stakeholders concerns and to help inform their strategy and develop the key messages.

KNEB has subsequently rolled out a strong public education programme, for example an outreach programme for schools, colleges and universities; participation in trade fairs, engineering fairs, county fora; and hosting meetings, conferences and workshops for different stakeholders. The SER includes a list of the different Stakeholder Involvement activities conducted over the last two years, including a National Stakeholder Conference and a visit by parliamentarians to operating countries and the IAEA. These activities have identified a number of common themes which have been converted in to a ‘frequently asked questions’ that is widely circulated at all events. KNEB also noted that they have specific events for the media, including a journalists’ competition.

KNEB has also developed a variety of informational, educational and communication materials that address the risks and benefits for introducing nuclear power in Kenya.

In July 2015, a broader public opinion poll survey, covering all 47 counties, was conducted to measure knowledge, support and receptiveness to the use of nuclear power in Kenya. The results of this survey are still being analysed, but have already provided useful feedback on preferred communication media and confirmed the appropriateness of the main messages developed as a result of the initial polling.

The INIR team was informed that the Regulatory Protection Board currently has no independent stakeholder involvement activities but they do participate, with other relevant stakeholders, in the events organised by KNEB.

Areas for further action	Significant	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

GP-11.1.1 Kenya undertook early public opinion polling to identify the main interests and concerns of stakeholders regarding nuclear power. This was used to guide the development of a comprehensive communications strategy, including activities, messages and preferred media.

12. Site and supporting facilities	Phase 1
Condition 12.1: General survey of potential sites conducted, and candidate sites identified	

<p>Summary of the condition to be demonstrated</p>	<p>In Phase 1, it is necessary to identify the main exclusion and avoidance criteria (covering safety, security, cost, socio-economic, engineering and environment) and conduct regional analysis to identify candidate sites. These should include the impact of external hazards on security and emergency response capability.</p> <p>Depending on the specific authorisation process of the Member State, site selection, justification, and authorization by the regulatory body will probably be required early in Phase 2, so plans should exist for the next Phase.</p>
<p>Examples of how the condition may be demonstrated</p>	<ol style="list-style-type: none"> 1. Report containing requirements covering: <ol style="list-style-type: none"> a. safety and security requirements for initial NPP site selection, consistent with NS-R-3; b. national requirements (e.g. socio-economic, environmental); c. engineering and cost requirements. 2. Report issued and approved identifying: <ol style="list-style-type: none"> a. regional analysis and identification of potential sites; b. screening of potential sites and—selection of candidate sites. 3. Evidence that the resources used for NPP site selection are competent and have experience in NPP site selection. 4. Plans for the work that will be required in Phase 2 to select and justify the site.
<p>Review observations</p> <p>The PFS and the 15 Year Strategic Plan detail several requirements related to socioeconomic, environmental, engineering and cost factors, as well as requirements derived from the IAEA documents. High level requirements in terms of the number of units and expected power level have been identified for the current programme. These requirements may be extended to include sites for spent fuel and radioactive waste management facilities.</p> <p>A regional survey process was conducted that identified a number of candidate areas for the nuclear power plant site. Continuation of the process is pending the establishment of the “Site Selection Panel” and the nuclear regulator.</p> <p>While KNEB is currently responsible for site selection activities, this responsibility is expected to be handed over, along with preliminary site selection work, to the future owner/operator once it has been identified.</p> <p>A requirements document, entitled “Site Selection for NPP’s in Kenya”, is under development by KNEB. The establishment of a “Site Selection Panel” is planned and is to be comprised of members from relevant government agencies. This panel will be responsible for the review of the site selection requirements document, review selected sites and assist the regulator in the establishment of siting regulations. The site selection document is expected to give guidance on site selection as well as to advise the nuclear regulator, once established, on the drafting of regulations.</p> <p>Section 46 of the draft Nuclear Regulatory Bill (2015) specifies provisions for the approval of sites via the preparation of a Site Evaluation Report. Regulations governing site evaluation are also</p>	

expected to be developed once the nuclear regulator is established. The INIR team considers that it is important that these regulations are finalised before commencing site evaluation studies.

The owner/operator will be responsible for site evaluation activities and will need to develop the necessary expertise, management systems, etc. to manage this process.

Areas for further action	Significant	No
	Minor	Site selection process

RECOMMENDATIONS

None

SUGGESTIONS

S-12.1.1 Kenya is encouraged to prepare for the completion of site selection activities, in accordance with a process endorsed by relevant stakeholders.

GOOD PRACTICES

None

13. Environmental Protection		Phase 1
Condition 13.1: Environmental framework and key issues for nuclear power outlined, and environmental studies production and communication recognized		
Summary of the condition to be demonstrated	<p>The NEPIO needs to be aware of international as well as national environmental requirements and to ensure that they are fully considered. Initial environmental studies should be conducted as appropriate for use in feasibility studies or siting studies (see Issue 12). The basis will be a set of criteria derived from the environmental requirements at a regional scale and with the use of available data.</p> <p><i>N.B Whilst control of radiological impact to people is considered under Issue 2, 7 and 8, there is a need to consider control of discharges to the environment and non-radiological impact.</i></p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Identification of key requirements for siting and during construction. 2. Procedures for the elaboration, reporting and assessment of environmental studies for nuclear and other related facilities. 2. Evidence of interactions by specialists with countries operating nuclear power. 3. Evidence that the non-radiological environmental issues: water use, transporting materials, disposal of hazardous waste, additional environmental monitoring requirements, construction impact, etc. 	

have been considered and taken into account by the NEPIO.
NB This is a key topic to be included in the stakeholder involvement programme described in Issue 11

Review observations

The SER and PFS notes that Kenya recognizes the unique characteristics of nuclear power and its potential impact on the environment. The Environmental Management and Coordination Act (EMCA) established the National Environment Management Authority (NEMA) to supervise and coordinate all matters related to the environment. Under the EMCA, all nuclear facilities will require a Strategic Environmental Assessment (SEA) and an environmental impact assessment (EIA). The Second Schedule of the Environmental Management and Coordination (Amendment) Act 2015 also designates nuclear reactors and nuclear plants as one of the projects to undergo EIA.

The INIR team was informed that the current EIA process is such that NEMA works together with relevant lead agencies, including RPB for radiological aspects, to review the EIA.

The INIR team was further informed that NEMA would issue the environmental authorization for the planned nuclear power plant, with support from the future regulatory body for the radiological aspects. NEMA will collaborate with KNEB to ensure that the EIA process for nuclear power plants is formalized.

The SER notes that baseline environmental studies were conducted as part of the initial site screening during site selection activities. A SEA was initiated by KNEB during the current financial year and is listed as one of the performance indicators in the current Performance Contract between KNEB and the Government. This assessment will assist in analysis of the environmental issues of the nuclear power programme and contribute to the decision making process.

While KNEB has studied various international approaches to the EIA process, there are currently no formal arrangements between Kenya and other countries with experience in the nuclear EIA process. The INIR team encouraged the establishment of such exchanges.

Areas for further action	Significant	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

14. Emergency Planning		Phase 1
Condition 14.1: Appreciation of the need for emergency planning, developed, and communication with and involvement of local and national government taken into account		
Summary of the condition to be demonstrated	<p>In Phase 1 the Government needs to be aware:</p> <ul style="list-style-type: none"> • of the nature of what is required for Emergency Response; • that significant resources will need to be expended to develop, maintain and demonstrate an Emergency Response capability; • that it is responsible for the national emergency response plan and will need to define clear responsibilities for all organisations involved. <p>The process of developing emergency response capability will be largely carried out in Phase 3.</p> <p><i>NB The requirements of the Early Notification and Assistance Conventions are covered under Issue 5.</i></p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Document summarising what will be required to address this issue and resources needed. 2. Recognition of the facilities and equipment that will be required for emergency response. 3. Consideration of the adequacy of current facilities used for local and national emergency response. 	
Review observations		
<p>Kenya has a National Emergency Response Plan & Standard Operating Procedures (NERP) which was approved in June 2014. Currently, the plan does not address nuclear or radiological emergencies. Kenya has developed two draft plans: 1) the National Radiation Emergency Plan (NREP) and, 2) the Kenya National Chemical, Biological, Radiological, and Nuclear (CBRN) Response Plan.</p> <p>The National Disaster Operations Centre (NDOC) has historically led the national coordinating mechanism for radiation emergency preparedness and response. In 2013, as a result of the increase in security related emergencies and disasters in the country, a new National Disaster Management Unit (NDMU) was created to lead emergency and disaster management units in Kenya.</p> <p>Emergency preparedness and response arrangements in the country are implemented jointly by NDOC, NDMU, RPB and all the stakeholders and response organizations. Kenya is currently enhancing its emergency preparedness and response system to manage the radiological sources in the country, but has not yet assessed the emergency preparedness and response requirements for nuclear power.</p>		
Areas for further action	Significant	Emergency preparedness and response
	Minor	No
RECOMMENDATIONS		
R-14.1.1 Kenya should assess the emergency preparedness and response requirements and resources		

necessary for nuclear power.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		
Condition 14.2: Emergency planning for existing radiation facilities and practices in place		Phase 1
Summary of the condition to be demonstrated	If any reviews or audits have been undertaken of the existing framework, there should be evidence that the actions resulting from it are being progressed. (It is probably more appropriate to review this in detail during Phase 2).	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Presentation of any action plans resulting from a review/audit with progress identified. 2. Presentation of current National radiation emergency plan taking into consideration facilities of threat category III and practices of threat category IV and V. 	
Review observations		
<p>An Emergency Preparedness Review (EPREV) mission was conducted in March 2015. The final report, “Peer Appraisal of the Arrangements in the Republic of Kenya Regarding the Preparedness for Responding to a Radiation Emergency”, includes several findings (recommendations and suggestions) that are applicable for all nuclear or radiological emergencies. The INIR team was informed that Kenya had developed and was implementing an Action Plan to address these findings.</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

15. Nuclear Security		Phase 1
Condition 15.1: Conditions for nuclear security acknowledged, and Necessary regulation identified		
Summary of the condition to be demonstrated	<p>The need to establish legislation and a regulatory framework are addressed under Issue 5 and 7.</p> <p>The NEPIO should recognise the importance of nuclear security and that it should be based on national threat assessments. It should ensure that a competent authority is designated for the preparation of the national threat assessment. The State should recognize that the design basis threat (DBT) should be used to define security at all nuclear facilities.</p> <p>Note: Nuclear security considerations including physical protection also need to include adequate consideration of safety and safeguards needs and vice versa.</p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. Clear identification of a competent authority that will develop the national threat assessment and a DBT for the NPP. 2. Recognition of the importance of nuclear security culture in each of the organisations involved. 3. Familiarity with IAEA nuclear security Recommendations and other States practices. 4. Evidence that nuclear security considerations for siting have been defined and fed into the siting assessment (see Issue 12). 5. Recognition of the availability of bilateral, multi-lateral and international cooperation and assistance. 6. Recognition of the need to address the safety, safeguards and security interface. 7. Recognition of the need for bilateral, multi-lateral and international cooperation 	
Review observations		
<p>The importance of security and physical protection for nuclear facilities/radioactive sources in storage or during transport has been acknowledged and addressed in the draft Nuclear Regulatory Bill (2015). Kenya has adopted the following international legal instruments in the area of nuclear security:</p> <ul style="list-style-type: none"> • The Convention on the Physical Protection of Nuclear Material (CPPNM) (2002); • The 2005 Amendment to the Convention on the Physical Protection of Nuclear Material (2007); • The International Convention for the Suppression of Terrorist Bombings (2006); • The International Convention for the Suppression of Acts of Nuclear Terrorism (2006); • The International Convention for the Suppression of the Financing of Terrorism (2003); • As a member of the UN, Kenya is bound to UN Security Council Resolutions 1373 and 1540. <p>The lead agency in the country is the National Security Council (NSC). The National Security Advisory Council advises the NSC on security issues. Other relevant entities include the police, military, intelligence service, and the Defense Ministry. The National Intelligence Act addresses the</p>		

issue of protection of sensitive information.

In 2012, Kenya established the Nuclear Security Coordination Center (NSCC) within the Radiation Protection Board (RPB) to handle nuclear security matters. The NSCC performs several roles and responsibilities, including: 1) identification, coordination and strengthening of national radiological/nuclear threat and risk mitigation capacities, and post-accident recovery strategies; 2) development and regular review of operational and action plans for the NSCC; 3) hosting and undertaking radiological and nuclear activities within the initiative of European Union CBRN Center of Excellence; 4) performing needs assessments in nuclear security; 5) maintaining the inventories for radiation sources and nuclear material; and 6) searching and securing orphaned radiation sources in the country. As a consequence of its expanded mandate on nuclear security, membership in the RPB board was expanded to include the Ministry of Foreign Affairs, the Armed Forces, Police, Customs and the intelligence service.

The INIR Team was informed that the NSCC is acting as the competent authority that will develop the national threat assessment and a design basis threat for the NPP, but this is not officially documented.

The Government will make arrangements for the establishment of an effective nuclear security regime including consideration of nuclear security in site assessment, improvement of the nuclear security culture in key organizations, and strengthening bilateral, multilateral and international cooperation for assistance in the nuclear security field.

A draft Security Strategy is being developed by KNEB, which will be discussed by NSCC and other relevant stakeholders.

KNEB has also developed a draft document “Holistic Approach to Nuclear Safety, Security and Safeguards (3S)” in March 2015, which addresses the safety, security and safeguards interfaces. The INIR team was informed that the next step will be for KNEB to share both documents with stakeholders that will be involved in the development of the nuclear power programme.

Areas for further action	Significant	Identify the competent authority
	Minor	No

RECOMMENDATIONS

R-15.1.1 Kenya should designate the competent authority that will develop the national threat assessment and a design basis threat for the nuclear power programme.

SUGGESTIONS

None

GOOD PRACTICES

None

Condition 15.2: Nuclear Security arrangements for existing radiation facilities and practices in place		Phase 1
Summary of the condition to be demonstrated	If any reviews or audits have been undertaken of the existing framework, there should be evidence that the actions resulting from it are being progressed. (It is probably more appropriate to review this in detail during Phase 2).	
Examples of how the condition may be demonstrated	Presentation of any action plans resulting from a review/audit with progress identified.	
Review observations		
<p>At present, the Radiation Protection Board (RPB) has the authority for implementing security and physical protection measures for radioactive sources in Kenya.</p> <p>Specific security measures have been installed by Kenya Ports Authority for the detection of any radioactive materials being transported illegally. The International Livestock Research Institute, which uses radioactive isotopes to carry out radioisotope labeling and irradiation, also utilizes specific security measures.</p> <p>Kenya cooperates with the United States' Global Threat Reduction Initiative, which has performed assessments of Kenya's security and physical protection infrastructure, most recently in January 2015. As a result of these assessments, Kenya has undertaken some improvements in its existing security infrastructure (i.e. installing monitoring portals, training RPB staff, police, custom officers, etc.).</p>		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

16. Nuclear Fuel Cycle		Phase 1
Condition 16.1: Knowledge of nuclear fuel cycle steps (front end and back end) and approaches developed		

<p>Summary of the condition to be demonstrated</p>	<p>At a strategic level it is necessary to consider how the fuel cycle will be established. Options need to be considered for the front end of the fuel cycle addressing, sourcing uranium and fuel manufacture, and for the back end of the fuel cycle, covering all the spent fuel inventory in the country and addressing spent fuel storage (at-reactor and away-from-reactor) and eventual disposal/reprocessing.</p>
<p><i>Examples of how the condition may be demonstrated</i></p>	<ol style="list-style-type: none"> 1. 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 (front-end and back-end) during phase 2. 2. A document identifying available national natural resources and capacities for the front-end fuel cycle and assessing available policy options for a national fuel cycle strategy taking account of non-proliferation issues. 3. A document clearly demonstrating that the NEPIO understands the regulatory requirements of fuel cycle facilities appropriate to their intended policy. 4. Clear allocation of responsibilities for development of the fuel cycle policy and strategy (front-end and back-end).
<p>Review observations</p> <p>The PFS identifies the various nuclear fuel cycle (NFC) options and activities, however Kenya has not yet assessed the feasibility and suitability of these options. The INIR team was informed that this is planned to be completed in parallel with the reactor technology assessment. A NFC policy will be developed once these assessments are complete. The INIR team was informed that the national NFC goals and requirements, which are necessary for the development of the national NFC policy, have not yet been developed. The INIR team was further informed that Kenya’s current preference is for an open nuclear fuel cycle, but it is also considering the possibility of returning spent fuel to the vendor.</p> <p>The INIR team was informed that the responsibility for the development of the national NFC policy falls within KNEB’s mandate. KNEB has already developed the scope of this document covering: a NFC description; NFC options; sources of supply; on-site storage; interim storage; and procurement of nuclear fuel.</p> <p>Options for uranium enrichment as well as reprocessing of spent fuel were evaluated in the PFS. The INIR team was informed that, given current concerns about proliferation and economic viability, enrichment and reprocessing are not expected to be implemented in Kenya at this stage but may be given possible future consideration. Kenya intends to rely on fuel from global supplies for the initial programme.</p> <p>Possible uranium and thorium deposits have been detected in various regions of the country. Exploratory drillings will be required to evaluate the potential of these deposits. The government, through the Ministry of Mining, intends to map out all mineral resources with the inclusion of</p>	

uranium and thorium deposits.		
Areas for further action	Significant	High level goals and requirements for nuclear fuel cycle
	Minor	No
RECOMMENDATIONS		
R-16.1.1 Kenya should assess the suitability of fuel cycle options, and define and document the national high level goals and requirements for establishing the nuclear fuel cycle.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		
Condition 16.2: Need for at-reactor spent fuel storage recognized, and Away-from-reactor spent fuel storage considered		Phase 1
Summary of the condition to be demonstrated	The NEPIO needs to be aware of options for spent fuel storage or reprocessing and that it will need to decide a strategy during Phase 2 and include the need for interim storage requirements consistent with that strategy.	
Examples of how the condition may be demonstrated	A document clearly showing that the NEPIO is aware of the need to consider available options for storage of spent fuel and for adequate capacity for spent fuel storage at-reactor consistent with the fuel cycle policy.	
Review observations		
The PFS describes several spent fuel storage technologies covering both at-reactor and interim storage options. The INIR team was informed that the aspects of spent fuel storage for the nuclear power programme would be studied in more detail in the future. Kenya understands the basic requirements for both at-reactor and interim storage.		
Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		

None
GOOD PRACTICES
None

17. Radioactive Waste		Phase 1
Condition 17.1: The burdens of radioactive waste from nuclear power plants recognized, and current capabilities for waste processing, storage and disposal reviewed		
Summary of the condition to be demonstrated	The decision to embark on a nuclear power programme must take account of the need for the handling, storage and disposal of radioactive waste and develop a national strategy.	
Examples of how the condition may be demonstrated	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, radioactive waste management infrastructure, radioactive waste arising and options for relevant processing, handling, storage, and disposal technologies and facilities. It should also address decommissioning waste. (Regulatory framework and financing schemes are addressed under Issue 7 and 4 respectively).	
Review observations		
<p>Current experience with radioactive waste management in Kenya is limited to disused sealed and unsealed radioactive sources arising from medical, industrial and research applications. The inventory is small, mainly low level waste and small amount of intermediate level waste. In addition there is also some naturally occurring radioactive material waste from mining activities.</p> <p>Radioactive waste is currently conditioned and stored at a central location operated by the Ministry of Roads and Infrastructure, or remains with the licensees. Radiation Protection Board (RPB) has the statutory responsibility for regulating activities related to the management of radioactive materials/waste.</p> <p>A new Central Radioactive Waste Processing Facility (CRWPF) has been constructed by RPB for waste from medical, research and industrial applications. The construction of the facility is complete and RPB is now in the process of purchasing the equipment for the labs and offices. The operator will be the Ministry of Roads and Infrastructure. CRWPF will store all radioactive waste from nuclear applications but is not expected to store waste from NPP.</p> <p>Technical expertise and experience for handling and managing radioactive waste exist but are limited to the existing waste inventory. RPB has trained several officers in radioactive waste management and some technical expertise is also inside the Ministry of Roads and Infrastructure (for handling</p>		

sealed radioactive sources). Kenya recognizes that the infrastructure for managing radioactive waste, including appropriate competencies and financial resources, will need to be expanded to manage waste generated from the nuclear power plant, but no plan has been developed.

The PFS describes the nature and volume of radioactive waste generated by NPPs and provides information on the disposal of different types of radioactive waste. In addition, an overview of international experience in radioactive waste management is given. While more specific consideration of waste arising from planned nuclear power programme has not been made, Kenya expects to develop more knowledge on this issue through the cooperation with other countries (e.g. agreement with Swedish SKB).

Kenya's main goals and high level requirements for radioactive waste management have not been identified, which will be necessary for the development of the policy and subsequent regulations for managing radioactive waste in Phase 2. The INIR Team was informed that KNEB was assigned the mandate to draft such policy.

Areas for further action	Significant	Radioactive waste management goals and requirements
	Minor	No

RECOMMENDATIONS

R-17.1.1 Kenya should assess the suitability of radioactive waste management options for processing, handling, storing and disposal of different radioactive waste types, and define and document the national high level goals and requirements.

SUGGESTIONS

None

GOOD PRACTICES

None

Condition 17.2: Options for ultimate disposal of all radioactive waste categories recognized	Phase 1
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Summary of the condition to be demonstrated	Although the ultimate route for disposal of high level waste can be decided later, it is important to understand the options for the different waste categories and to recognise that adequate options ultimately have to be selected.
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Examples of how the condition may be demonstrated	A document clearly indicating that the NEPIO understands options for disposal of different radioactive waste categories.
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Review observations

Currently, no disposal facility for radioactive waste exists in Kenya and no activities or surveys

related to the disposal of radioactive waste have been performed		
Brief consideration of the disposal options for different waste categories is given in the PFS but without considering the specific national situation and requirements if the nuclear power programme will be implemented (see Recommendation R-17.1.1.).		
Areas for further action	Significant	Disposal options
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

18. Industrial Involvement		Phase 1
Condition 18.1: National policy with respect to national and local industrial involvement considered		
Summary of the condition to be demonstrated	<p>A recommended policy for national involvement, covering availability of expertise, industrial capability and technical services for the overall programme (assuming more than one NPP is planned); the balance between capability, quality standards and intended industrial development should be recognized.</p> <p>Note: Typically the first NPP is constructed with very limited local industrial involvement. This can be introduced gradually as national experience increases and the programme develops.</p>	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. 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, with a review of their ability to satisfy the requirements of a nuclear power programme. 2. A survey of local suppliers with the potential to supply equipment or services supporting nuclear power plant construction, maintenance and/or operation including: <ol style="list-style-type: none"> a) equipment for workshops and labs; b) local and national origin consumables; c) spare parts. 3. Meetings with or training of potential suppliers to explain standards and qualifications required and review feasibility of involvement. 	

	4. A summary of industries capable of participating in non-nuclear safety related construction or support services activities with any required actions and funding requirements.	
<p>Review observations</p> <p>Kenya has various mechanisms to support industrial involvement and understands the importance of establishing a national policy to direct industrial involvement for the NPP project. KNEB is currently working on what this policy should contain and, together with the Ministry of Industrialisation, plans to develop this policy within the 2015-2016 financial year.</p> <p>A general industrial capability survey entitled “Census of Industrial Production” was conducted from November 2010 to April 2011 by the Ministry of Industrialization in collaboration with Kenya National Bureau of Statistics (KNBS). This survey was not specific to nuclear power. KNEB plans to work with KNBS to conduct a nuclear specific survey.</p> <p>KNEB has conducted site visits to several companies to assess their possible level of participation on non-nuclear grade components.</p>		
Areas for further action	Significant	Industrial involvement capability survey and policy
	Minor	No
RECOMMENDATIONS		
R-18.1.1 Kenya should complete its plans to perform a nuclear power specific industrial capability survey and develop a national policy to guide industrial involvement planning and capacity building.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		
Condition 18.2: Need for strict application of quality programmes for nuclear equipment and services recognized, and consistent policies for nuclear procurement in place		Phase 1
Summary of the condition to be demonstrated	If the national policy in 18.1 supports national or local industrial involvement in construction or support services, there needs to be a clear intent to develop the required management systems and to meet the required standards.	
Examples of how the condition may be demonstrated	<ol style="list-style-type: none"> 1. A policy or plan for development of an appropriate management system (including quality control and assurance). 2. Evidence of the availability of required investment. 	
<p>Review observations</p> <p>The existing Kenya Bureau of Standards develops and adopts standards for local application, and also</p>		

manages various certification programmes. This statutory body is also responsible for the following activities:

- Promotion of standardization in commerce and industry;
- Provision of testing and calibration facilities;
- Product and system certification programmes;
- Undertaking educational work in standardization and practical application of standards; and
- Maintenance and dissemination of International System of Units (SI) of measurements.

The INIR team was informed that Kenya intends to host workshops for key national industrial stakeholders that will assist them in developing their knowledge base on the various requirements and codes and standards for the Kenyan nuclear power programme.

Areas for further action	Significant	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

19. Procurement		Phase 1
Condition 19.1: Unique criteria associated with purchasing nuclear equipment and services recognized		
Summary of the condition to be demonstrated	<p>Procurement policies taken with full knowledge of the special requirements for nuclear procurement; recognition of the need for a procurement policy consistent with the industrial participation policy.</p> <p>A qualified team to write the request for proposal and BIS for the selection of the potential NPP supplier and contractor. The specification should match all the national legal and regulatory requirements.</p> <p>A strategy for procuring the equipment and services needs to be developed. Recognize the requirements of any procurement by the owner/operator outside of the main supply contract.</p>	
Examples of how the condition may be	<p>1. Clear recognition of the issues related to procurement covering local, national and foreign supplies, and a plan to develop a specialized</p>	

demonstrated	<p>procurement team during phase 2.</p> <ol style="list-style-type: none"> 2. Recognition of the global import/export controls arrangements. 3. A recruitment and training programme to build-up the procurement team during Phase 2.
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Review observations

Kenya has assessed the various options for appointing the future owner/operator and expects to finalise this implementation approach in Phase 2.

The Public Procurement and Disposal Act (PPDA) of 2005 prescribes the procedures and contract management requirements for efficient public procurement by public entities. The PPDA also establishes the Public Procurement Oversight Authority, which plays an oversight role of procurement within the public sector. Provisions managing international procurement and possible conflict with international agreements are also prescribed in the PPDA. Some mechanisms for exemption from the PPDA are included in the Act.

The Public Private Partnership Act of 2013 may also be applicable depending on the nature of the adopted implementation approach.

The PFS discusses the various contracting strategies available to the owner/operator and identifies the need for a procurement policy. A suitable strategy and policy is expected to be established by the owner/operator once appointed.

Kenya has developed some good expertise in managing the procurement of national infrastructure projects. Personnel have already been trained on aspects of procurement within the nuclear power sector, but there is recognition that additional capacity will be necessary.

Procurement of the various key studies and activities for Phase 2 may be managed either by KNEB or by the owner/operator. Kenya is aware of the various nuclear power specific requirements for the establishment and management of these contracts as well as considerations for their possible transfer from the KNEB to the owner/operator, if appropriate.

Areas for further action	Significant	No
	Minor	Strategy for managing procurement activities for Phase 2

RECOMMENDATIONS

None

SUGGESTIONS

S-19.1.1 Kenya is encouraged to clarify the responsibilities and associated plans to establish the necessary capability to manage Phase 2 procurement activities.

GOOD PRACTICES

None

ATTACHMENT 2: LISTS OF THE INIR MISSION TEAM AND COUNTERPARTS

INIR MISSION REVIEW TEAM	
Jose BASTOS	Team Leader, IAEA
Matthew VAN SICKLE	Coordinator, IAEA
Sharon RIVERA	IAEA
Irena MELE	IAEA
Tim KOBETZ	IAEA
Abdellah CHAHID	IAEA
Brian MOLLOY	IAEA
Rod SPEEDY	International Expert
Julio BARCELO	International Expert
Stephen MORTIN	International Expert

PARTICIPANTS FROM KENYA				
	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)	LEAD PERSON
1	National position	Executive Chairman; Basett Buyukah, Wandera Emmanuel; Harrison Ngugi; Eddie Omondi	KNEB	Hon. Ochilo Ayacko
		Jonathan Lodompui	Vision 2030	
		Johnson Okello	The Senate	
		John Omenge	Ministry of Energy and Petroleum	
2	Nuclear safety	Joseph Maina	RPB	Eng. Collins Juma/Joseph Maina
		Eng. Collins Juma; Victor Musembi; Chesire Edwin; Diana Musyoka	KNEB	

3	Management	Winnie Ndubai; Nancy Mberia; Harrison Ngugi;	KNEB	Winnie Ndubai
		Arthur Koteng	Radiation Protection Board	
		John Omenge	Ministry of Energy and Petroleum	
		David Kariuki	ERC	
		Willis Ochieng	Kenya Electricity Generating Company	
4	Funding and financing	Lenard Menya; Nancy Mberia; Winnie Ndubai	KNEB	Lenard Menya
		Jonathan Lodompui	Vision 2030	
		Johnson Okello	The Senate	
		John Omenge	Ministry of Energy and petroleum	
		Willis Ochieng	Kenya Electricity Generating Company	
5	Legislative framework	Phillip Mutai; Njeri Kaniaru; Catherine Kianji; Katua Muinde; Eddie Omondi	KNEB	Phillip Mutai
		Johnson Okello	The Senate	
6	Safeguards	Arthur Koteng	RPB	Arthur Koteng
		Chesire Edwin; Victor Musembi; Diana Musyoka; Njeri Kaniaru; Catherine Kianji; Eddie Omondi	KNEB	
		Mokua Onyiego	National Intelligence Service	
		Johnson Okello	The Senate	
7	Regulatory framework	Phillip Mutai; Njeri kaniaru; Catherine Kianji; Eddie Omondi; Chesire Edwin; Nduma Joseph; Joe Mwangi; Victor Musembi	KNEB	Phillip Mutai
		Joseph Maina; Arthur Koteng	RPB	

		Douglas Macharia	Ministry of Interior & Coordination of National Government	
8	Radiation protection	Joseph Maina	RPB	Joseph Maina
		Ali Mwenzei	NEMA	
		Victor Musembi; Chesire Edwin; Diana Musyoka	KNEB	
9	Electrical grid	John Kennedy/Eric Ohaga/Harrison Sungu	KPLC/KETRACO	Samson Akuto
		Joseph Nduma; Eng. Collins Juma; Chesire Edwin	KNEB	
		David Kariuki	ERC	
		Willis Ochieng	Kenya Electricity Generating Company	
10	Human resources development	Sophia Githuku; Harrison Ngugi; Winnie Ndubai; Lillian Matu	KNEB	Joseph Odhiambo/Sophia Githuku
		Bro. Charles Omanga	Central Organization of Trade Unions (Kenya)	
		Bartilol Simion	Institute of Nuclear Science & Technology	
		Joseph Odhiambo	Ministry of Education	
		Felix Wanjala	National Commission for Science Technology and Innovation	
11	Stakeholder involvement	Basett Buyukah; Emmanuel Wandera; Esther Musyoka; Dennis Nkonge; Carl Madara	KNEB	Basett Buyukah
		Bro. Charles Omanga	Central Organization of Trade Unions (Kenya)	
		Njiraini Mwende	Communications Authority of Kenya	
		Johnson Okello	The Senate	
		John Omenge/ Koriu K. Raymond/ Joseph Ndogo	Ministry of Energy and petroleum	

		Joseph Odhiambo	State Department of Science & Technology	
12	Site and supporting facilities	Eng. Collins Juma; Kenneth Anakoli; Diana Musyoka; Pauline Mulongo	KNEB	Eng. Collins Juma
		John Omenge/ Koriu K. Raymond/ Joseph Ndogo	Ministry of Energy and petroleum	
		Eng. Joseph M. Kinyua	Water Resources Management Authority	
		Dr. E. Dindi	Department of Geology - UoN	
		Eng. Michael Muchiri	Ministry of Transport & Infrastructure	
		Silas Omondi	Ministry of Lands, Urban Housing & Development	
		Ali Mwanzei	NEMA	
13	Environmental protection	Ali Mwanzei/ Boniface Mamboleo	NEMA/Ministry of Environment	Ali Mwanzei
		Eng. Joseph M. Kinyua	Water Resources Management Authority	
		Victor Musembi; Chesire Edwin; Diana Musyoka; Catherine Kianji; Kenneth Anakoli; Njeri Kaniaru	KNEB	
14	Emergency planning	Pius Masai/Dr. Edward Kiema/ Amos Onchiri	NDMU/NDOC	Pius Masai/Dr. Edward Kiema
		Njiraini Mwendu	Communications Authority of Kenya	
		Moses Luvasi	Regional Disaster Management Centre of Excellence	
		Pauline Mulongo; Winnie Ndubai; Emmanuel Wandera	KNEB	

15	Nuclear security	Prof. Erastus Gatebe	National Security Coordination Center (NSSC)	Prof. Erastus Gatebe
		Mokua Onyiego	National Intelligence Service	
		Joseph Maina; Arthur Koteng	RPB	
		Pauline Mulongo; Victor Musembi; Chesire Edwin; Diana Musyoka	KNEB	
		Douglas Macharia	Ministry of Interior & Coordination of National Government	
16	Nuclear fuel cycle	Eng. Collins Juma; Joe Mwangi; Kenneth Anakoli; Victor Musembi; Nduma Joseph	KNEB	Eng. Collins Juma
		Dr. E. Dindi	Department of Geology	
17	Radioactive waste	Joseph Maina	RPB	Joseph Maina
		Victor Musembi; Chesire Edwin; Diana Musyoka; Joe Mwangi	KNEB	
		Eng. Michael Muchiri	Ministry of Transport & Infrastructure	
		Ali Mwanzei	National Environment Management Authority	
		Silas Omondi	Ministry of Lands, Urban Housing & Development	
18	Industrial involvement	Mathew Nyamu	Ministry of Industrialization & Enterprise Development	Mathew Nyamu
		Emmanuel Wandera; Nancy Mberia	KNEB	
		Willis Makokha/ Kelvin Khisa	Kenya Industrial Research & Development Institute	
		Nicholas Gachie/Victor Gathogo	Kenya Association of Manufacturers	
		Bro. Charles Omanga	Central Organization of Trade Unions (Kenya)	

		Ahmed Ibrahim; Samuel Gacheru/Grace Ateka	Kenya Bureau of Standards	
19	Procurement	Richard Bii; Naftaly Gitonga; Nancy Mberia; Winnie Ndubai; Pauline Mulongo; Emmanuel Wandera; Njeri Kaniaru	KNEB	Nancy Mberia
		Willis Ochieng	Kenya Electricity Generating Company	

ATTACHMENT 3: REFERENCES

Documents provided by Kenya

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5. INIR, Integrated Nuclear Infrastructure Review Missions – Guidance on Preparing and Conducting INIR Missions (Rev.1), Vienna (2011)
6. Establishing the Safety Infrastructure for a Nuclear Power Programme, Safety Standards Series No. SSG-16, Vienna (2012)
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8. Other publications as appropriate from the bibliography included in Reference 2
9. IAEA expert mission reports, as appropriate

ATTACHMENT 4: ACRONYMS

A

AP Additional Protocol

B

C

CB Capacity Building

CBRN Chemical, Biological, Radiological, and Nuclear Response Plan

CPPNM Convention on the Physical Protection of Nuclear Material

CRWPF Central Radioactive Waste Processing Facility

CSA Comprehensive Safeguards Agreement

CTBT Comprehensive Nuclear-Test-Ban Treaty

D

E

EIA Environmental Impact Assessment

EMCA Environmental Management and Coordination Act

EPREV Emergency Preparedness Review

F

H

HR Human Resource

I

IAEA International Atomic Energy Agency

INIR Integrated Nuclear Infrastructure Review

INLEP International Nuclear Leadership Education Program

J

K

KNBS	Kenya National Bureau of Statistics
KNEB	Kenya Nuclear Electricity Board

L

LCPDP	Least Cost Power Development Plan
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M

MEST	Ministry of Education, Science and Technology
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N

NEMA	National Environment Management Authority
NEPC	Nuclear Electricity Project Committee
NEPIO	Nuclear Energy Implementing Organization
NERP	National Emergency Response Plan & Standard Operating Procedures
NDMU	National Disaster Management Unit
NDOC	National Disaster Operations Centre
NPP	Nuclear Power Plant
NPT	Treaty on Non-Proliferation of Nuclear Weapons
NSC	National Security Council
NSCC	Nuclear Security Coordination Center

O**P**

PPDA	Public Procurement and Disposal Act
PTBT	Partial Test Ban Treaty

Q**R**

RPB	Radiation Protection Board
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S

SA	Subsidiary Arrangements
SEA	Strategic Environmental Assessment
SSAC	State System on Accounting for and Control of Nuclear Materials
SQP	Small Quantity Protocol

T

TAMU	Texas A&M University
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V**W**

WANO	World Association of Nuclear Operators
WASP	Wien Automatic System Planning