MISSION REPORT

ON

THE INTEGRATED NUCLEAR INFRASTRUCTURE REVIEW (INIR) - PHASE 2

Counterpart:

Agency for the Development of Nuclear Energy (Uzatom),

Ministry of Energy of the Republic of Uzbekistan

24 May – 3 June 2021

Tashkent, Republic of Uzbekistan

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EXECUTIVE SUMMARY

The demand for electricity in the Republic of Uzbekistan is expected to double by 2030 due to the country's growing population and rapid economic and industrial development. Uzbekistan is planning to build its first nuclear power plant to keep pace with rising electricity demand and to cut CO_2 emissions. The Agency for the Development of Nuclear Energy (Uzatom Agency) was established under the Ministry of Energy of the Republic of Uzbekistan to lead the coordination of the national nuclear development as the nuclear energy program implementing organization (NEPIO).

Uzbekistan signed an inter-governmental agreement with the Russian Federation in September 2018 for the development of Uzbekistan's first nuclear power plant (NPP). The facility will have two units with a combined capacity of 2400 MW(e). The first unit is planned to be connected to the grid in 2028 and the second in 2030.

The Directorate for NPP Construction was established as the customer and operating organization of the NPP. The State Committee on Industrial Safety (Goskomprombez) is the authorized regulatory body responsible for the implementation of a unified state policy and control in the field of ensuring radiation and nuclear safety at nuclear power and nuclear technology facilities.

On 12 April 2019, the Ministry of Energy of the Republic of Uzbekistan requested the International Atomic Energy Agency (IAEA) to conduct an Integrated Nuclear Infrastructure Review (INIR) Phase 2 mission in Uzbekistan (readiness to invite bids/negotiate a contract for the first NPP). The INIR mission was conducted from 24 May to 3 June 2021.

The INIR mission and associated activities were funded through a combination of the IAEA Technical Cooperation project UZB2002 entitled *Building Human Resources Capacity and Developing National Nuclear Infrastructure for a First Nuclear Power Plant*, extrabudgetary contributions from the Peaceful Uses Initiative (PUI), the Nuclear Security Fund and an in-kind contribution from the Government of the Uzbekistan.

Mr Jurabek Mirzamahmudov, Director General of the Agency for the Development of Nuclear Energy (Uzatom Agency), coordinated the mission on Uzbekistan side. The INIR mission team was led by Mr Milko Kovachev, Head of the Nuclear Infrastructure Development Section of the IAEA, and consisted of staff from the IAEA Departments of Nuclear Energy, Nuclear Safety and Security, Safeguards and the Office of Legal Affairs as well as international experts recruited by the IAEA. Measures implemented by Uzbekistan for the duration of the INIR mission were well coordinated, particularly COVID-19 related safety measures.

The INIR team concluded that Uzbekistan has made significant progress in the development of its nuclear power infrastructure. The programme has strong support from the Government and a clear commitment to safety, security and non-proliferation is evident. Uzbekistan has strengthened its national legal framework, signed an inter-governmental agreement for NPP construction and taken steps to enhance its regulatory framework.

In order to assist Uzbekistan in making further progress in its infrastructure development, the INIR team made 8 Recommendations and 16 Suggestions. The INIR team also identified 5 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:

- **Uzbekistan Needs to Complete its Legal and Regulatory Framework**

  Uzbekistan has a complex legal and regulatory framework for nuclear safety, nuclear security and safeguards and has adopted relevant regulations, norms and standards of the supplier country. Uzbekistan needs to adhere to and implement the remaining international legal instruments to which it is not yet a party. To ensure consistency and completeness, consolidation and strengthening of legislation is needed. The regulatory framework has been developed for the oversight for the nuclear and radiation safety. Further development and streamlining of its application during construction is needed.

- **Uzbekistan Needs to Ensure that the Regulatory Body has Adequate Resources and Competence**

  Uzbekistan has taken steps to strengthen its nuclear regulatory body by enhancing its stature and approving plans to increase its staff in line with the needs of the nuclear power programme. The Government needs to ensure adequate human and financial resources for the regulatory body to develop its competence and build public trust. Goskomprombez has demonstrated a commitment to continuous improvement. Through further development of its management system and safety culture, the organization can effectively and efficiently discharge its functions in support of the programme.

- **Uzbekistan Needs to Complete Technical Studies and Prepare the Owner/Operator to Manage Phase 3 Activities**

  Uzbekistan has made significant progress in NPP project development including preparation of the site permit application, planning the supporting infrastructure, establishing the owner/operator and negotiating the engineering, procurement and construction contract (EPC contract). Work remains to be completed on project related studies, environmental assessment procedures, stakeholder engagement and development of the owner/operator capabilities to manage construction activities. Strengthening the operator's management system will promote a strong safety culture.

1. INTRODUCTION

The demand for electricity in the Republic of Uzbekistan is expected to double by 2030 due to the country's growing population and rapid economic and industrial development. Currently, about 86% of electricity in Uzbekistan is generated from three major sources: gas, coal and oil; the remainder is generated from hydropower.

Uzbekistan is planning to build its first nuclear power plant to keep pace with rising electricity demand and to cut CO2 emissions. Nuclear energy is expected to account for 12% of the country's electricity mix and ensure a stable energy supply. The choice was made in favour of nuclear power given the country's abundant uranium resources.

According to the Decree of the President of the Republic of Uzbekistan dated 19 July 2018 *On Measures to Develop Nuclear Energy in the Republic of Uzbekistan*, the Agency for the Development of Nuclear Energy was established under the Ministry of Energy of the Republic of Uzbekistan to lead the coordination of the national nuclear development as the Nuclear Energy Program Implementing Organization (NEPIO).

Uzbekistan signed an inter-governmental agreement with the Russian Federation in September 2018 for the development of Uzbekistan's first nuclear power plant. The facility will have two units with a combined capacity of 2400 MW(e). The first unit is planned to be connected to the grid in 2028 and the second in 2030.

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On 12 April 2019, the Ministry of Energy of the Republic of Uzbekistan requested the International Atomic Energy Agency (IAEA) to conduct an Integrated Nuclear Infrastructure Review (INIR) Phase 2 mission (readiness to invite bids/negotiate a contract for the first NPP). A self-evaluation report (SER) and supporting documents were submitted to the IAEA on 2 June 2020. An SER support mission and a Pre-INIR mission were conducted from 9 to 12 November 2020. Uzbekistan submitted the updated SER and supporting documents in March 2021. The INIR mission was conducted from 24 May to 3 June 2021.

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2. OBJECTIVES OF THE MISSION

The main objectives of the INIR mission were to:

— Evaluate the development status of the national infrastructure to support the nuclear power programme according to the IAEA publication entitled *Milestones in the Development of a National Infrastructure for Nuclear Power, IAEA Nuclear Energy Series No.*NG-G-3.1 (Rev. 1), and the evaluation conditions described in the *Evaluation of the Status of National Infrastructure Development, IAEA Nuclear Energy Series No.* NG-T-3.2 (Rev.1);

— Identify the areas needing further actions to reach Milestone 2: *Ready to invite bids/negotiate a contract for the first nuclear power plant*;

— Provide recommendations and suggestions which can be used by the Government of the Republic of Uzbekistan and national institutions to prepare an action plan.

3. SCOPE OF THE MISSION

The INIR mission evaluated the status of the infrastructure in the Republic of Uzbekistan covering all of the 19 infrastructure issues relative to the Phase 2 conditions identified in the above-mentioned IAEA publications.

4. WORK DONE

Prior to the mission, the INIR team reviewed the self-evaluation report and supporting documentation that included relevant national laws, regulations and reports. The INIR team sought input from the IAEA staff members with relevant expertise. The INIR team preparatory meetings were conducted prior to the mission in Tashkent from 21 to 23 May 2021.

The INIR mission was conducted from 24 May to 3 June 2021. The meetings were held at the Uzatom headquarters in Tashkent. The main interviews were conducted over six days. Uzbekistan was very well prepared for the mission and managed its participation in the review effectively. During the interviews, the Uzbek counterparts provided an update on the current status of issues where progress had been made since the self-evaluation report was finalized, and provided additional supporting documentation requested by the INIR team (list of participants is in Appendix 2).

The preliminary draft report was prepared by the INIR team and discussed with the counterparts. The main mission results were presented to representatives of the Government of Uzbekistan in an exit meeting on 3 June 2021. 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 2. Appendix 1 provides the evaluation results for each issue.

5. MAIN CONCLUSIONS

The INIR mission was conducted in a cooperative and open atmosphere. Uzatom, the Directorate for NPP Construction, Goskomprombez and several other governmental organizations involved in the nuclear power programme participated in the mission (Appendix

2 provides the full list of participants). Measures implemented by Uzbekistan for the duration of the INIR mission were well coordinated, particularly COVID-19 related safety measures.

The INIR team concluded that Uzbekistan has made significant progress in the development of its nuclear power infrastructure. The programme has strong support from the Government and a clear commitment to safety, security and non-proliferation is evident. Uzbekistan has strengthened its national legal framework, signed an inter-governmental agreement for NPP construction and taken steps to enhance its regulatory framework.

In order to assist Uzbekistan in making further progress in its infrastructure development, the INIR team made 8 Recommendations and 16 Suggestions. The INIR team also identified 5 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:

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  Uzbekistan has a complex legal and regulatory framework for nuclear safety, nuclear security and safeguards and has adopted relevant regulations, norms and standards of the supplier country. Uzbekistan needs to adhere to and implement the remaining international legal instruments to which it is not yet a party. To ensure consistency and completeness, consolidation and strengthening of legislation is needed. The regulatory framework has been developed for the oversight for the nuclear and radiation safety. Further development and streamlining of its application during construction is needed.

- **Uzbekistan Needs to Ensure that the Regulatory Body Has Adequate Resources and Competence**

  Uzbekistan has taken steps to strengthen its nuclear regulatory body by enhancing its stature and approving plans to increase its staff in line with the needs of the nuclear power programme. The Government needs to ensure adequate human and financial resources for the regulatory body to develop its competence and build public trust. Goskomprombez has demonstrated a commitment to continuous improvement. Through further development of its management system and safety culture, the organization can effectively and efficiently discharge its functions in support of the programme.

- **Uzbekistan Needs to Complete Technical Studies and Prepare the Owner/Operator to Manage Phase 3 Activities**

  Uzbekistan has made significant progress in NPP project development including preparation of the site permit application, planning the supporting infrastructure, establishing the owner/operator and negotiating the EPC contract. Work remains to be completed on project related studies, environmental assessment procedures, stakeholder engagement and development of the owner/operator capabilities to manage construction activities. Strengthening the operator’s management system will promote a strong safety culture.

Recommendations

R-2.1.1 Goskomprombez and the operating organization should agree on a communication protocol to facilitate their effective interaction during the licensing process.

R-4.2.1 Uzatom should complete the feasibility study as early as possible to ensure an informed basis for the project.

R-5.1.1 Uzbekistan should complete the adherence processes for and implement the provisions of the Convention on Nuclear Safety, the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and the Vienna Convention on Civil Liability for Nuclear Damage.

R-7.1.1 Goskomprombez should use the time until the review and assessment of the construction license application to strengthen its competence.

R-7.2.1 Goskomprombez should complete the development of the regulations and guides needed to authorize and oversee construction.

R-8.1.1 Uzbekistan should further specify roles and responsibilities regarding implementation and oversight of radiation protection measures and radiological environmental monitoring programmes.

R-9.1.1 Uzbekistan should execute the technical studies in order to assess the necessary grid enhancements.

R-10.2.1 The Government should ensure adequate human and financial resources for the Department of Radiation and Nuclear Safety of Goskomprombez in line with the needs of the NPP project.

Suggestions

S-1.2.1 Uzbekistan is encouraged to complete the work extending the energy planning beyond 2030 in order to reduce project risk.

S-2.1.1 Goskomprombez is encouraged to finalize regulatory requirements for oversight of safety culture in the operating organization.

S-2.1.2 Goskomprombez is encouraged to develop its organizational safety culture.

S-2.2.1 The operating organization is encouraged to further specify future support for safe operation of the NPP.

S-3.2.1 The operating organization is encouraged to adjust its staffing plans to reflect developments in the EPC contract negotiations as needed.

S-3.3.1 All key organizations are encouraged to complete the development of their management systems to promote safety culture and achieve a high level of performance.

S-5.1.1 Uzbekistan is encouraged to adhere to and plan for the implementation of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention, and the Convention on Supplementary Compensation for Nuclear Damage.

S-5.2.1 Uzbekistan is encouraged to reassess and amend as necessary its legal framework to ensure its overall consistency and that all aspects of a comprehensive nuclear law are adequately addressed.

S-5.3.1 Uzbekistan is encouraged to further review other non-nuclear legislation that may have an impact on the nuclear power programme and amend it in a timely manner, as necessary.

S-6.2.1 The Directorate for NPP Construction is encouraged to further study the experience of new NPP owner/operators in specifying safeguards requirements and in establishing systems for nuclear material accounting and control.

S-7.1.1 Goskomprombez is encouraged to further study international experience in regulatory oversight activities for nuclear power.

S-7.2.1 Uzbekistan is encouraged to regularly assess and enhance the effectiveness and efficiency of the process for developing regulations and guides.

S-11.1.1 The Directorate for NPP Construction is encouraged to put in place a stakeholder involvement plan in line with the progress of the project.

S-11.2.1 Uzatom is encouraged to finalize the national stakeholder involvement strategy coordinated with the regulator and the operator.

S-13.1.1 Uzatom is encouraged to conduct public hearings in order to complete the environmental impact assessment (EIA) process.

S-15.4.1 Uzbekistan is encouraged to pursue best practice exchanges with partner countries in the area of nuclear security culture.

Good Practices

GP-1.1.1 The Government has demonstrated commitment and engagement at the highest level in establishing and strengthening the key organizations. This has attracted people into managerial positions who have megaproject experience in the energy sector and a proven ability to coordinate among a complex set of government stakeholders.

GP 4.1.1 Uzbekistan has established a dedicated development fund with a steady revenue stream and a year-to-year carryover mechanism to help support infrastructure development for the NPP programme.

GP-10.3.1 Uzbekistan has established a local branch of an experienced university to provide a pipeline of specialists for the nuclear power programme and is coordinating the academic curriculum with that of other higher education institutions in an integrated association.

GP-10.3.2 Uzatom has developed a system to ensure that reserves of talented students and qualified specialists and managers currently employed in other sectors are identified, have received mentoring and training and can be hired rapidly into critical positions in the key organizations, as necessary.

GP-15.1.1 The availability of an information sharing agreement between the supplier country and the recipient country is essential to the parties' ability to exchange sensitive nuclear security information required to design and develop the NPP's physical protection system.

6. EVALUATION RESULTS FOR PHASE 2

For the purposes of the INIR mission results, the following definitions are used:

Significant* actions needed:

The review observations indicate that important work still needs to be initiated or completed to meet the condition.

Minor* actions needed:

The review observations indicate that some additional work or steps are needed to meet the condition or that plans for the next phase need to be enhanced.

No actions needed:

The available evidence indicates that all the work to meet the condition has been completed.

* The judgment whether the actions are significant, or minor is based on the importance of the work to the overall programme and/or the resources needed to complete it. The classification is done through a consensus of the INIR team and is not based solely upon the judgment of any individual team member.

Recommendations:

Recommendations are proposed when the expectations of the condition have not been met. A recommendation should:

— Emphasize 'what' needs to be done, not 'how';

— Be based on the IAEA Milestones Approach/Evaluation Methodology;

— Be succinct, self-explanatory and achievable;

— Be supported by the Review Observation text—a 'gap' must be identified; already planned work can still be a recommendation if it is required to reach the milestone.

Suggestions:

Suggestions propose the consideration of new or different approaches to develop infrastructure and enhance performance, or to point out better alternatives to current work. A suggestion:

— Should be clear and self-explanatory;

— Should be supported by the Review Observation text;

— May relate to work already under consideration for the next phase.

Good practices:

A good practice is identified in recognition of an outstanding practice or arrangement, superior to those generally observed elsewhere. It is more than fulfilment of the conditions or expectation, and 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 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
1.1. Government support role defined and effective			**X**
1.2. Overall strategic approach established for contracting for the NPP		**X**	
1.3. Commitments and obligations of owner, operator and regulatory body established			**X**
2. Nuclear safety	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
2.1. Safety responsibilities of key organizations recognized	**X**	**X**	
2.2. Expectations for relationship with suppliers established		**X**	
3. Management	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
3.1. Contract specifications and evaluation criteria determined			**X**
3.2. Owner/operator competence for procuring and managing the NPP contract evident and plans to develop operator competence available		**X**	
3.3. Management systems established	**X**		
4. Funding and financing	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
4.1. Funding plan available			**X**
4.2. Means of financing established and strategy for management of financial risks available	**X**		

5. Legal framework	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
5.1. Adherence to all international legal instruments governing nuclear activities	**X**		
5.2. A comprehensive nuclear law enacted		**X**	
5.3. All other legislation affecting the nuclear power programme reviewed	**X**		
6. Safeguards	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
6.1. Strengthening of the SSAC underway			**X**
6.2. SSAC requirements for the NPP recognized and addressed		**X**	
6.3. Design information requirements for safeguards recognized			**X**
7. Regulatory framework	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
7.1. Competent, effectively independent nuclear regulatory body established	**X**	**X**	
7.2. Regulatory framework developed	**X**	**X**	
8. Radiation protection	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
8.1. Development of radiation protection programmes and expansion of appropriate infrastructures planned	**X**		
9. Electrical grid	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
9.1. Detailed studies undertaken to determine grid enhancements	**X**		

9.2. Plans, funding and schedule for grid enhancement available			**X**
10. Human resource development	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
10.1. Knowledge and skills needed in organizations for Phase 3 and operational phase identified			**X**
10.2. A plan available to develop and maintain human resources	**X**		
10.3. An integrated national strategy developed			**X**
11. Stakeholder involvement	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
11.1. Stakeholder involvement plans being implemented		**X**	
11.2. Stakeholder involvement plans coordinated	**X**		
12. Site and supporting facilities	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
12.1. Detailed site characterization completed			**X**
12.2. Plans in place to prepare site for construction			**X**
13. Environmental protection	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
13.1. Environmental impact assessment performed	**X**		
13.2. Environmental characteristics provided			**X**
13.3. Clear and effective regulation of environmental issues established			**X**

14. Emergency planning	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
14.1. Responsibilities of each organization clearly defined and approach for emergency planning being developed			**X**
15. Nuclear security	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
15.1. Required physical protection measures developed			**X**
15.2. Programmes in place for the management of sensitive information			**X**
15.3. Programmes in place for the trustworthiness of personnel			**X**
15.4. Programmes in place for promotion of nuclear security culture		**X**	
16. Nuclear fuel cycle	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
16.1. Front end fuel cycle strategy defined			**X**
16.2. Back end fuel cycle strategy defined			**X**
17. Radioactive waste management	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
17.1. Handling the burdens of radioactive waste considered			**X**
17.2. Preliminary decommissioning plan requested			**X**

18. Industrial involvement	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
18.1. National capabilities assessed and plans to enhance capability defined			**X**
19. Procurement	**Phase 2**		
Condition	**Actions Needed**		
	SIGNIFICANT	**MINOR**	**NO**
19.1. Procurement capability available			**X**

APPENDIX 1: REVIEW OBSERVATIONS, RECOMMENDATIONS AND SUGGESTIONS FOR PHASE 2

1. National Position **Condition 1.1: Government support role defined and effective**	**Phase 2**
Summary of the condition to be demonstrated	The government has approved a specific nuclear power programme, with a clear commitment to safety, security and non-proliferation. The NEPIO continues to ensure that the work to develop the nuclear infrastructure is coordinated and a government ministry has been assigned the responsibility to support the development of the programme to ensure that: (a) All the government actions needed to support the programme are monitored and coordinated with the project schedule; (b) A policy for nuclear fuel cycle, radioactive waste management and decommissioning is established; (c) Safety, security and safeguards responsibilities are formulated and understood by all relevant organizations; (d) Appropriate support and encouragement of knowledge transfer from States that have experience with a nuclear power programme are available through bilateral agreements; (e) The State fully participates in all the activities associated with the global nuclear safety and security and non-proliferation regime.
Examples of how the condition may be demonstrated	(1) Evidence that an ongoing government role for nuclear power programme implementation has been clearly defined and established within a government agency (e.g. energy or industry). (2) Evidence that the required government actions are monitored and coordinated with the project schedule. *(3)* Appropriate bilateral agreements in place with vendor countries (e.g. an intergovernmental agreement) *Note: These may not be complete at the end of Phase 2 or subject to review given that the detailed contract may still need to be agreed.* (4) A defined responsibility for formulating a strategy for fuel cycle and radioactive waste management. (5) Examples of how the State participates in the global nuclear safety and security regime.

Observations

The Agency for the Development of Nuclear Energy (Uzatom Agency) was created in July 2018 in accordance with the Presidential Decrees No. 5484 and 3870 with the overall responsibility for the development and implementation of Uzbekistan's nuclear power programme. Uzatom Agency is subordinate to the Ministry of Energy and has been assigned the role of coordinating the national nuclear power programme as nuclear energy programme implementing organization (NEPIO). An intergovernmental agreement for the construction of the first nuclear power plant (NPP) was signed with the Russian Federation in September 2018. The responsibilities of Uzbekistan's regulatory body, the State Committee for Industrial Safety (hereinafter referred to as Goskomprombez), were extended

and clarified in December 2018 by the Presidential Decree No. 5594. Uzatom's Directorate for NPP Construction was established as a legal entity by the Cabinet of Ministers of the Republic of Uzbekistan's (hereafter Cabinet of Ministers) Resolution No. 102 in February 2019. The Concept for the Development of Nuclear Energy in the Republic of Uzbekistan for 2019-2029 ('the Concept') and the roadmap for its implementation were developed and approved by the President of Uzbekistan in February 2019 . The Law on the Peaceful Use of Atomic Energy No. 565 (hereinafter referred to as 2019 Atomic Energy Law), with provisions for nuclear safety, nuclear security, non-proliferation and civil liability, was adopted in September 2019.

Uzatom is supported by the Scientific, Technical and Expert Council (hereinafter referred as 'the Council'). The Cabinet of Ministers Resolution No. 800 defines the objectives, composition and functions of the Scientific, Technical and Expert Council, which is chaired by the Minister of Energy and consists of representatives of all involved ministries. The Council selected the VVER-1200 (AES 2006) design of Energoproekt (Moscow), with the Novovoronezh NPP-2 as the reference plant. The INIR team was informed that this design was considered as the most suitable for Uzbekistan. The Council reviewed the results of the site survey and selected a site on the Aydar Arnasay system of lakes as the preferred site. An alternative site was also selected 4 km away. In November 2020, the Council decided on dry cooling towers as an important design change in comparison to the reference plant which uses wet cooling towers.

The Concept and roadmap for the nuclear power programme define the roles and responsibilities of different organizations involved in the implementation of the programme. The implementation of the nuclear power programme is monitored by the Prime Minister. Regular progress reports are prepared to identify deficiencies and enable corrective actions to be taken. This is intended to ensure timely implementation and alignment between the needed institutional capacity and the schedule of the programme and the project.

According to the Article 30 of the 2019 Atomic Energy Law the Directorate for NPP Construction has been assigned as the NPP operating organization and is foreseen to gradually evolve over time. The INIR team was informed that this evolution is reflected in the EPC contract currently being negotiated.

The roadmap for the implementation of the Concept foresees the development and approval of relevant policies. The human resource development strategy and plan have been approved. The INIR team was informed that a draft policy and strategy on spent fuel management and radioactive waste management have been developed and are in the approval process while other relevant policies remain to be developed. The roadmap includes plans for Uzbekistan's adherence to the relevant international legal instruments.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

GP-1.1.1 The Government has demonstrated commitment and engagement at the highest level in establishing and strengthening the key organizations. This has attracted people into managerial

positions who have megaproject experience in the energy sector and a proven ability to coordinate among a complex set of government stakeholders.

1. National Position **Condition 1.2: Overall strategic approach established for contracting for the NPP**	**Phase 2**
Summary of the condition to be demonstrated	The State has a clear justification for its nuclear power programme and has established a strategy for developing contract arrangements for the NPP (e.g. build–own–operate, build–own–operate–transfer, strategic partnerships, and turnkey and multiple contracts) and has a rationale supporting the decision. The strategy may include requesting bids for more than one option.
Examples of how the condition may be demonstrated	(1) A document reviewing contracting strategies and justifying the chosen approach with evidence that the chosen strategy is consistent with national legislation and has been agreed to by all relevant stakeholders. (2) Implications recognized, and a plan to fulfil necessary requirements in place; a document setting out responsibilities of key national organizations and intended contracting strategy.

Observations

Currently Uzbekistan's electricity generation capacity is approximately 12.9 GW, of which 11 GW (or 84.7%) is generated from thermal power plants that use hydrocarbons such as natural gas, coal and fuel oil, while 1.85 GW (or 14.3%) is generated from hydroelectric power plants.

In 2019, electricity demand in Uzbekistan was 66.7 billion kWh, compared to 63.5 billion kWh of electricity generated. Based on projected population and economic growth, the electricity demand is expected to double (120.8 billion kWh) by 2030. To ensure a sustainable energy supply based on predictive energy studies, the Ministry of Energy proposed an increase in generating capacity, diversification of the energy sector and the introduction of advanced innovative technologies. This includes the introduction of the peaceful use of nuclear energy into the national energy mix by building the first NPP between 2020-2030.

The INIR team was informed that the Ministry of Energy developed a master plan for the energy sector development and diversification with the support of an external consultant. The master plan provides for further decarbonization of the energy mix through the expansion of wind, solar and hydro power. The main drivers described are enhancing the energy security of the country, addressing environmental degradation, and reducing greenhouse gas emissions. Energy planning scenarios are envisaged to be developed extending beyond 2030.

The approved Concept and roadmap highlight the peaceful purpose of the nuclear power programme, its focus on protecting people and the environment from the harmful effects of ionizing radiation, and non-proliferation in accordance with the safety standards and security guidance of the IAEA. The roadmap has a horizon until 2030 when the operation of the nuclear power plant is envisaged to start. The Concept and roadmap also include potential contractual approaches. Uzbekistan decided on an EPC/turnkey contract.

On 29 December 2017, Uzbekistan signed an intergovernmental agreement (IGA) with the Russian Federation on the peaceful use of nuclear energy. On 7 September 2018, another IGA was signed on cooperation in the construction of the first NPP (two-unit VVER-1200) on the territory of the Republic of Uzbekistan (2018 IGA on NPP construction). Under this agreement and consistent with the EPC contract that is currently being negotiated, the plant will be owned and operated by Uzbekistan.		
Areas for further action	**Significant**	No
	Minor	Energy Planning
RECOMMENDATIONS		
None		
SUGGESTIONS		
S-1.2.1 Uzbekistan is encouraged to complete the work extending the energy planning beyond 2030 in order to reduce project risk.		
GOOD PRACTICES		
None		

1. National Position **Condition 1.3: Commitments and obligations of owner, operator and regulatory body established**	**Phase 2**
Summary of the condition to be demonstrated	The owner, operator and regulatory body have been established and the responsibilities of each organization have been clearly defined and understood, including their safety, security and safeguards responsibilities. The role of any national supporting organization (e.g. a technical support organization) has been clearly defined, as has any significant role for non-national organizations (e.g. vendor or other regulator). The latter is clearly defined in the contracting strategy.
Examples of how the condition may be demonstrated	(1) Roles and responsibilities clearly defined with respect to nuclear safety, security and safeguards in the operating, regulatory and technical support organizations. (2) Definition of the organization that will be the licensee of the NPP and evidence of adequate resources to comply with licence requirements. Definition of the roles and responsibilities of the owner if different from the operator. (3) Definition of any intended regulatory collaboration.
Observations The 2019 Atomic Energy Law assigns the roles and responsibilities of the key organizations involved in the nuclear power programme in Uzbekistan. Article 18 of the Atomic Energy Law outlines the rights and the obligations of the State regulatory bodies with responsibilities in the field of nuclear safety. Article 31 specifies the rights and obligations of the operating organization. Article 24 describes the right of citizens, non-governmental non-profit organizations, and other civil society institutions to participate in hearings on the use of atomic energy.	

The NPP will be state-owned under the Ministry of Energy and Uzatom. Uzatom has responsibilities in the field of managing the national nuclear programme, concluding agreements and contracts on design, construction, and operation of nuclear power facilities. The Scientific, Technical and Expert Council, a working commission, and working groups were established to provide technical support to Uzatom in the implementation of the nuclear programme and project and ensure the development of the required national nuclear infrastructure.

Uzatom is supported by legal and technical advisors for the contract negotiations, the law firm White & Case LLP and UJV Rez respectively. Uzatom has established a joint venture with Worley (Australia). The INIR team was informed that Uzatom has cooperation with Rosatom (Russian Federation), Rosatom Technical Academy, Assystem (France), the Ministry of Energy of the Republic of Belarus, the Japan Atomic Industrial Forum International Cooperation Center, the World Nuclear University (WNU) and the Global Center for Nuclear Energy Partnership, which is part of the Department of Atomic Energy of the Government of India. Uzatom is developing cooperation with KEPCO (Republic of Korea).

The Directorate for NPP Construction includes departments for design, safety, human resources and physical protection and is responsible for contract management and construction oversight. This entity is considered as the future licensee and will apply for and hold the respective site permit and construction and operation licenses.

Goskomprombez is the authorized State body responsible for the implementation of a unified State policy and supervision in the field of radiation and nuclear safety at nuclear facilities. Goskomprombez is the regulatory body for the use of atomic energy for peaceful purposes and in its functions is supported by and receives input from 11 other state bodies with regulatory functions in different areas such as radiation safety, nuclear security and environmental protection. Goskomprombez is supported by Rostekhnadzor and its technical support organization JSC V/O Safety as per the IGA and respective contractual arrangements.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

2. Nuclear Safety Condition 2.1: Safety responsibilities of key organizations recognized	Phase 2
Summary of the condition to be demonstrated	The government has expanded its nuclear safety policy and strategy to include nuclear power. The owner/operator and the regulatory body have a detailed understanding of safety standards and have begun the task of understanding the safety basis of an NPP. Senior positions in the owner/operator and the regulatory body have been filled for some time and the leadership of both the owner/operator and the regulatory body have initiated programmes and practices to build a safety culture in their respective organizations. They have also agreed on a protocol for communication between the owner/operator, the regulatory body and the vendor that covers correspondence, meetings and actions, among other things. The regulatory body has specified requirements on how the competence of owner/operator staff in positions related to safety is ensured. The owner/operator, the regulatory body and technical support organizations, as appropriate, have the expertise to prepare for the review of safety assessments supplied by the vendor.
Examples of how the condition may be demonstrated	(1) Nuclear safety principles and requirements developed by the regulatory body and the owner/operator; (2) Appropriate training for regulators, owner/operators and technical specialists carried out; (3) Knowledge of international experience that is relevant to NPP designs being considered; (4) For key leadership positions, a summary of NPP safety related experience and development; (5) Programmes to promote safety culture through leadership; (6) Protocol agreed for interactions between owner/operator, regulator, vendor and technical support organizations; (7) Process and responsibilities defined for review and understanding of information supplied by the vendor during construction.

Observations

Uzatom Agency is the authorized government body responsible for the implementation of a unified State policy and strategic direction in the development and the use of nuclear energy in Uzbekistan. Within Uzatom, the primary responsibility for the NPP project belongs to the Directorate for NPP Construction which is a legal entity. The INIR team was informed that the Directorate for NPP Construction will apply for and hold the site permit and construction and operating licenses. As the licensee, the Directorate for NPP Construction has the prime responsibility for meeting nuclear safety requirements in accordance with the law.

Goskomprombez is the regulatory body responsible for oversight and supervision to ensure nuclear safety, including authorization, inspection and enforcement. Goskomprombez coordinates with other regulatory authorities with roles and responsibilities related to safety. In this regard , Cabinet of Ministers Resolution No. 663 dated 28 October 2020 (under Article 20 of the Nuclear Law) on the Procedure for Licensing Activities in the Field of Atomic Energy Use has been issued. This regulation contains general provisions, describes roles and responsibilities, license requirements and conditions and other aspects. Safety culture as part of training and retraining is included in the license requirements

and conditions. Further, verification of compliance with license conditions is part of the scope of inspection defined in Regulation No. 368 of 10 June 2020 on the Procedure for the Conduct of State Supervision and Inspection in the Field of the Atomic Energy Use by Authorized State Bodies.

Goskomprombez has developed a draft regulation on development and implementation of safety culture within the NPP operating organization. The Directorate for NPP Construction has reflected safety culture in its quality management programme, which was consented by Goskomprombez.

Goskomprombez organized a seminar for its senior managers to increase their awareness of the importance of safety culture.

Procedures related to licensing matters are described in the Goskomprombez Charter and Goskomprombez normative documents. Goskomprombez and Uzatom have developed mechanisms for inter-organizational interactions, but communication protocols during the licensing process have not yet been established.

Areas for further action	**Significant**	Communication protocol during licensing
	Minor	Regulatory requirements for safety culture Safety culture in Goskomprombez

RECOMMENDATIONS

R-2.1.1 Goskomprombez and the operating organization should agree on a communication protocol to facilitate their effective interaction during the licensing process.

SUGGESTIONS

S-2.1.1 Goskomprombez is encouraged to finalize regulatory requirements for oversight of safety culture in the operating organization.

S-2.1.2 Goskomprombez is encouraged to develop its organizational safety culture.

GOOD PRACTICES

None

2. Nuclear Safety **Condition 2.2: Expectations for relationship with suppliers established**	**Phase 2**
Summary of the condition to be demonstrated	Future role of the vendor, or other bodies, in supporting safe operation has been defined by the owner/operator (e.g. any design authority role or support role in managing emergency situations). Training requirements from the vendor or other bodies have also been defined.

Examples of how the condition may be demonstrated	Statements defining the required levels of support from the vendor and other bodies and mechanisms for information exchange, training and technical support, among other things.

Observations

Among other things, Article 5 of the 2018 IGA on NPP construction obligates the general contractor to:

— Develop a technical design for the NPP with corresponding documentation;
— Develop a safety analysis report, taking into account requirements for safety stipulated by the legislation of the Russian Federation and the Republic of Uzbekistan; and
— Provide documents to the customer for the authorization of the design, construction, commissioning and operation of the nuclear power plant.

The INIR team was informed that further responsibilities of the vendor, operator and other bodies are to be described in the EPC contract in line with the relevant IAEA safety standards.

The INIR team was informed that a contract is foreseen to be negotiated with the vendor for services required related to safe operation.

A branch of the National Research Nuclear University (MEPhI) has been established in Tashkent, which is engaged in training personnel for Uzbekistan's nuclear industry. The INIR team was informed that the hiring needs, the list of specializations and the training programme for certain plant personnel will be defined in the EPC contract.

Through the Agreement on the Convergence of Approaches to Legal and Regulatory and Technical Regulation, Conformity Assessment, Standardization, Accreditation and Metrological Support in the Field of Atomic Energy Use for Peaceful Purposes (Kazan, 26 May 2017) Uzbekistan adopted 220 codes and standards relevant to the project.

Areas for further action	**Significant**	No
	Minor	Future support for safe operation

RECOMMENDATIONS

None

SUGGESTIONS

S-2.2.1 The operating organization is encouraged to further specify future support for safe operation of the NPP.

GOOD PRACTICES

None

3. Management **Condition 3.1: Contract specifications and evaluation criteria determined**		**Phase 2**
Summary of the condition to be demonstrated	If competitive bidding for an NPP is being undertaken, a detailed bid invitation specification (BIS) has been completed, together with the criteria that will be used to evaluate the bids. If the vendor has already been selected (e.g. by an intergovernmental agreement), the owner/operator has included its requirements in the specifications for negotiating with a sole supplier. Negotiating strategy and criteria have also been developed.	
Examples of how the condition may be demonstrated	(1) Documented BIS available and evaluation criteria clearly defined. (2) Description of the negotiating strategy defined by the NPP owner/operator.	

Observations

Following the signing of the 2018 IGA for NPP construction, the initial set of customer requirements was developed after a screening of the potential designs and their application in other international projects.

The requirements include the main technical parameters of the plant, as well as other technical, grid and regulatory requirements. Uzbekistan decided that the preferred plant design should be licensed in the country of origin and demonstrated. The technical requirements were developed together with all related ministries and approved by the Cabinet of Ministers.

The overall negotiation strategy and selection criteria were developed with the support of international legal and technical consultants and were approved by the Ministry of Energy as a basis for negotiation.

The project will be implemented using the EPC turnkey approach. Based on the IGA, the State Corporation Rosatom was designated as the technology provider. After review of the design characteristics, the Scientific, Technical and Expert Council selected Novovoronezh NPP-2, VVER-1200 reactor designed by JSC Atomenergoproekt, Moscow, as the reference plant.

The contracting strategy for the implementation of the project was agreed by both parties and includes separate contracts: for engineering surveys for the technical design, EPC contract, fuel contract, contract for the physical protection system and service contract for the NPP maintenance.

Seven working groups were created to conduct contractual negotiations: EPC, technical, finance, project management and quality, construction, regulations and personnel training.

The INIR team was informed that the negotiations are ongoing, and parties are discussing, among other issues, the technical solutions to meet certain site-specific characteristics.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None
SUGGESTIONS
None
GOOD PRACTICES
None

3. Management **Condition 3.2: Owner/operator competence for procuring and managing the NPP contract evident and plans to develop operator competence available**	**Phase 2**
Summary of the condition to be demonstrated	The owner/operator is competent to manage the procurement requirements and to ensure the contract requirements are fully met. This will include verification of project progress and quality requirements. This may include the appointment of the owner's engineer to support the owner organization. If this involves a split package or multipackage procurement approach, a significantly greater level of competence will be required. The owner/operator needs to have plans to develop the capability for safe and secure operation, including: (a) Recruiting and training staff; (b) Procedures to ensure that knowledge critical to safe and secure operation will be preserved; (c) Procedures to create the required awareness with regard to the risk of proliferation of nuclear weapons through export or import.
Examples of how the condition may be demonstrated	(1) Description of the organization, including roles and responsibilities of departments and individuals with respect to bid assessment, supervision of construction, development of knowledge base, and understanding of operating and maintenance requirements. (2) Evidence of a suitably qualified and experienced team with competence in all required areas, including: (a) Bid requesting and bid evaluation; (b) Awarding, and issuing purchase orders; (c) Financing, letters of credit and taxes; (d) Quality programmes, including inspection of items under manufacturing, testing and receipt of goods and non-conformance procedures; (e) Transport, insurance and customs clearing; (f) Types of proven design of NPP and potential suppliers; (g) Main technical characteristics of potential plants;

	(h) Codes and standards; (i) Contracting methodologies; (j) Project management, manufacturing schedule and delivery time. (3) Plans to develop: (a) Project reporting mechanisms; (b) Acceptance procedures and criteria; (c) Commissioning skills; (d) The organization that will be required for commissioning and operating the NPP; (e) Commissioning, operating and maintenance procedures. (4) Interfaces with other organizations defined and agreed. (5) Evidence that appropriate staff have gained experience from operating plants similar to those being considered. (6) Plans to participate in appropriate owner's groups.

Observations

The staffing plan for the Directorate for NPP Construction includes 54 management and specialist positions in 12 departments. The recruited staff should have relevant experience in areas including project management, procurement, construction and technical supervision.

The INIR team was informed that the functions and responsibilities of the departments have been elaborated in their respective charters. Essential activities with regard to the contract management , e.g. work and schedule progress control, risk management, contract management and document management have been considered.

The Directorate is considering engaging a Project Management consultant or Owner's Engineer to support the supervision of the project implementation.

The technical department is responsible for developing the management system and implementing quality control.

Currently, 22 management and expert positions of the Directorate have been filled, and the complete staffing of all 54 positions is expected in 2021. A schedule for further increasing the staffing capacity in line with the project development has been developed and was approved by the Ministry of Energy. Its implementation is foreseen upon the signing of the EPC contract.

The staffing approach is described in the Directorate's procedures. The approach to training is included in the Quality Management Programme.

A set of the Russian Federation's norms and regulations applicable to the project including industrial and manufacturing standards is available and developing understanding of their application is included in the staff training and retraining programs.

The INIR team was informed that the EPC contract will specify the planned structure of the operating organization, staffing level, qualification requirements, training schedule, recruitment schedule, training and appointment as operating personnel.

Areas for further action	**Significant**	No

	Minor	Operator staffing plan
RECOMMENDATIONS		
None		
SUGGESTIONS		
S-3.2.1 The operating organization is encouraged to adjust its staffing plans to reflect developments in the EPC contract negotiations as needed.		
GOOD PRACTICES		
None		

3. Management **Condition 3.3: Management systems established**	**Phase 2**
Summary of the condition to be demonstrated	Management systems have been defined for each of the three key organizations and include roles, responsibilities, organizational structure and processes (for Phase 2), including record keeping. The processes for Phase 3 are in place or planned to be produced before they are required. The management systems cover safety, nuclear security and safeguards, and are consistent with IAEA Safety Standards Series No. GSR Part 2, Leadership and Management for Safety. The systems promote a strong safety and security culture, include plans for self and independent evaluation, and include procedures to ensure that knowledge critical to the safe, secure and peaceful use of nuclear energy will always be preserved. For the NEPIO and the regulatory body, they also include mechanisms to monitor the programme for infrastructure development and to ensure it is consistent with the project schedule.
Examples of how the condition may be demonstrated	(1) For each organization, availability of the integrated management system manual, definition of key processes and responsibilities, and plans to produce required detailed documentation. (2) Mechanism for NEPIO to manage the infrastructure development programme.
Observations Resolutions of the Cabinet of Ministers No. 653 and No. 75 outline the management systems of Uzatom and Goskomprombez. The resolution on establishment of the Uzatom Agency specifies the status, organization, functions, tasks, rights, and responsibilities of the Agency. It also specifies the evaluation criteria and operational indicators of the effectiveness of the Agency's activities.	

Uzatom's Department charters and procedures govern processes such as procurement, human resource development and interdepartmental communication. Development of internal documents is performed on the basis of an annually approved plan. Uzatom foresees the development of plans for promoting safety culture.

Goskomprombez's management system includes charters of its four Directorates and their 14 departments. Internal procedures are being developed in accordance with annually approved schedules. The INIR team was informed that Goskomprombez is planning to develop and implement an integrated management system. Consultations regarding its development were carried out with an external technical support organization (TSO), and a draft resolution was developed and submitted to the Cabinet of Ministers for approval.

The INIR team was informed that the Directorate for NPP Construction has undertaken a systematic approach toward establishing its management system.

The Directorate's Technical Department is responsible for quality management and is developing the Quality Management Programme (POCAS 09-01: 2019), procedures for human resource development and departments' charters describing the main processes. The Quality Management Programme includes a process for developing safety culture.

Areas for further action	**Significant**	Management system development
	Minor	

RECOMMENDATIONS

None

SUGGESTIONS

S-3.3.1 All key organizations are encouraged to complete the development of their management systems to promote safety culture and achieve a high level of performance.

GOOD PRACTICES

None

4. Funding and Financing Condition 4.1: Funding plan available	Phase 2
Summary of the condition to be demonstrated	The means by which costs that are not the fiscal responsibility of the owner/operator have been identified. Depending on the contracting model, these may include costs associated with legislation, setting up the owner/operator, education, training, research, government roles (e.g. environmental assessment process, stakeholder involvement), the regulatory body, emergency planning, spent fuel and radioactive waste management and decommissioning.
Examples of how the condition may be demonstrated	(1) Mechanisms established for funding the regulatory body, including technical support organizations. (2) Proposed means identified for funding spent fuel and radioactive waste management and decommissioning. (3) Phase 3 funding plan matched to NPP project plan including all national commitments for participation in construction, owner/operator costs, regulator costs, other stakeholders and emergency planning.

Observations

Uzatom, Goskomprombez and the Directorate for NPP Construction are funded through the State budget. For this purpose, annual estimates of expenditures and incomes are prepared and approved for each organization and registered by the Ministry of Finance. The budget preparation process includes a forecast for the three subsequent years. Each year the Senate approves the Law on State Budget.

The budget includes four categories of expenditures: payroll as per the approved organizational structure, taxes, capital expenditures as per signed contracts and programme documents, and other expenditures.

Based on changes to the structure of the organizations involved in the nuclear programme, staffing lists are approved and submitted to the Ministry of Finance so that the changes are considered in the budget process. The INIR team was informed that this is sufficient for ensuring resources for Goskomprombez, Uzatom and the Directorate.

The Fund for the Development of Atomic Energy ('Development Fund') was created as an additional resource for the programme. This fund receives contributions from the export of uranium (up to ten percent of the revenue of the State Enterprise Navoi Mining and Metallurgical Plant) and can receive grants from international organizations and others. Unspent funds from one year can be carried over to the next year. The fund is administered by Uzatom, and the use of resources is controlled and monitored by the Ministry of Finance.

Goskomprombez can request to use the Development Fund for technical services required. Other needs arising from the nuclear power programme, for example support for environmental assessment, are addressed in the respective budgets of the involved organizations.

The INIR team was informed that two separate funds will be created to cover the liabilities arising from decommissioning and radioactive waste management. Uzatom is preparing a draft decree for the establishment of these funds with support from the Academy of Sciences and the Ministry of Finance. The funds must be established prior to the start-up of the plant, and levies will be included in the price

of electricity. There will be periodic reassessments of the levies based on updated cost estimates for decommissioning and radioactive waste management.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
GP 4.1.1 - Uzbekistan has established a dedicated development fund with a steady revenue stream and a year-to-year carryover mechanism to help support infrastructure development for the NPP programme.		

4. Funding and Financing **Condition 4.2: Means of financing established and strategy for management of financial risks available**	**Phase 2**
Summary of the condition to be demonstrated	A credible feasibility study has been finalized and realistic financing options for the NPP have been identified. An owner/operator financial team has been established and is competent to identify potential lenders and additional investors, evaluate and/or negotiate financing offers, analyse the extent of, and risks associated with, any State backed power purchase agreement and/or sovereign guarantees, and identify and analyse additional financial risks. A clear sense of what is acceptable to senior decision makers is available. The financial risks have been clearly identified and a strategy for negotiation and/or evaluation of key finance related proposals has been developed.
Examples of how the condition may be demonstrated	(1) A document identifying how the project will be financed and demonstrating financial viability of the project, including implications for electricity tariffs. (2) Risk management proposals identifying all the key financial risks, and how they can be addressed through contracts and/or guarantees. These need to cover operational difficulties, public liabilities, delays in construction, regulatory delays, government/public intervention and electricity price fluctuations. (3) A negotiating mandate and/or more detailed guidance based, for example, on the high-level terms in an intergovernmental agreement.

	Note: There are likely to be constraints on how much of this specific information will be available, but information needs to be available on the process that has been used to develop and underwrite the plan.

Observations

The construction of the NPP will be financed through a sovereign loan from the Russian Federation. It is foreseen that an intergovernmental agreement for financing will be signed before concluding the EPC contract. The INIR team was informed that the loan will cover part of the financing and that Uzbekistan is to provide an advance of at least 10%.

The INIR team was informed that a dedicated unit at Uzatom controls the project schedule and financial risks and that a risk matrix was prepared and used. Some of the risks considered are macroeconomic risks and contractor performance risk. Potential construction cost overruns are regarded as the biggest risk to the project.

The INIR team was informed that the off-taker of the electricity will be the National Grid of Uzbekistan, a state-owned monopoly, and therefore access to the grid and off-take is guaranteed. The Cabinet of Ministers' Resolution No. 310 establishes the principles for electricity tariffs in the country. The electricity tariff of the NPP will be defined by a commission under the Cabinet of Ministers, in accordance with this regulation. The tariff will be set for one year with a provision for a 5-year extension thereafter.

The INIR team was informed that, according to the national legislation, any new project requires a feasibility study. Uzatom will contract such a feasibility study, considering not only the plant, but also other relevant infrastructure costs such as grid connections and roads. The Terms of Reference (ToR) for this work was approved by the Scientific, Technical and Expert Council, and the tendering process is ready to be initiated. Some input data, such as grid connection cost, are still to be adjusted. Uzatom intends to start the feasibility study after the EPC contract is negotiated. The expected duration of this work is six months.

Areas for further action	**Significant**	Project feasibility study
	Minor	No

RECOMMENDATIONS

R-4.2.1 Uzatom should complete the feasibility study as early as possible to ensure an informed basis for the project.

SUGGESTIONS

None

GOOD PRACTICES

None

5. Legal Framework **Condition 5.1: Adherence to all international legal instruments governing nuclear activities**	**Phase 2**
Summary of the condition to be demonstrated	The Member State has adhered to the following international legal instruments and is following an action plan for their implementation: (a) Convention on Early Notification of a Nuclear Accident (INFCIRC/335); (b) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (INFCIRC/336); (c) Convention on Nuclear Safety (INFCIRC/449); (d) Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (the 'Joint Convention') (INFCIRC/546); (e) Convention on the Physical Protection of Nuclear Material (INFCIRC/274/Rev. 1) and Amendment thereto (INFCIRC/274/Rev.1/Mod.1); (f) Vienna Convention on Civil Liability for Nuclear Damage (INFCIRC/500); (g) Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (INFCIRC/566); (h) Convention on Supplementary Compensation for Nuclear Damage (INFCIRC/567); (i) Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (INFCIRC/402); (j) Comprehensive safeguards agreement — based on The Structure and Content of Agreements Between the Agency and States Required in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (INFCIRC/153 (Corrected)); (k) Additional protocol — following the provisions of Model Protocol Additional to the Agreement(s) Between States(s) and the International Atomic Energy Agency for the Application of Safeguards (INFCIRC/540 (Corrected)); (l) Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA.
Examples of how the condition may be demonstrated	Evidence that the State has adhered to the relevant international legal instruments and is implementing the obligations arising from them.
Observations Uzbekistan is party to the following international legal instruments adopted under the auspices of the IAEA: — Joint Convention on the Safety of Spent fuel Management and on the Safety of Radioactive Waste Management (in force: 2009); — Convention on the Physical Protection of Nuclear Material (in force: 1998); and — Amendment to the Convention on the Physical Protection of Nuclear Material (in force: 2016);	

— Agreement between the Republic of Uzbekistan and the IAEA for the application of safeguards in connection with the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) (1994);
— Protocol additional to the Agreement between the Republic of Uzbekistan and the IAEA for the application of safeguards in connection with the NPT (1998);
— Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA to the Government of the Republic of Uzbekistan (1994).

According to the Concept for the Development of Nuclear Energy (for the period 2019–2029) and the Roadmap for its implementation, as approved by the Decree of the President of the Republic of Uzbekistan No DP-4165, dated 7 February 2019, adherence to the following international legal instruments is being pursued as a priority:

— Convention on Nuclear Safety;
— Convention on Early Notification of a Nuclear Accident (Early Notification Convention);
— Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (Assistance Convention);
— Vienna Convention on Civil Liability for Nuclear Damage (Vienna Convention).

The INIR team was informed that the national adherence process for these instruments is ongoing and that Uzbekistan aims to deposit its instruments of adherence by the end of 2021.

Further, the INIR team was informed that following the completion of adherence to the prioritized instruments, Uzbekistan may consider adherence to the:

— Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (1997 Revised Vienna Convention);
— Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention;
— Convention on Supplementary Compensation for Nuclear Damage.

According to Article 17 of the 2018 IGA on NPP Construction, civil liability for nuclear damage shall be regulated by the parties in accordance with the Vienna Convention, and the terms of the convention shall apply as if Uzbekistan is party to the convention.

In the context of Uzbekistan's plans to adhere to the Early Notification Convention, the INIR team was informed that consultations with the neighboring countries are ongoing.

Areas for further action	**Significant**	International legal instruments
	Minor	No

RECOMMENDATIONS

R-5.1.1 Uzbekistan should complete the adherence processes for and implement the provisions of the Convention on Nuclear Safety, the Convention on Early Notification of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency and the Vienna Convention on Civil Liability for Nuclear Damage.

SUGGESTIONS

S-5.1.1 Uzbekistan is encouraged to adhere to and plan for the implementation of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, the Joint Protocol Relating to

the Application of the Vienna Convention and the Paris Convention, and the Convention on Supplementary Compensation for Nuclear Damage.
GOOD PRACTICES
None

5. Legal Framework **Condition 5.2: A comprehensive nuclear law enacted**	**Phase 2**
Summary of the condition to be demonstrated	The Member State has enacted the national nuclear legislation that: (a) Establishes an independent nuclear regulatory body with adequate human and financial resources, and a clear and comprehensive set of functions; (b) Identifies responsibilities for safety, security and safeguards; (c) Formulates safety principles and rules (radiation protection, nuclear installations, radioactive waste and spent fuel management, decommissioning, mining and milling, EPR and the transport of radioactive material); (d) Formulates nuclear security principles; (e) Gives appropriate legal authority for, and definition of, the responsibilities of the regulatory body and all competent authorities establishing a regulatory control system (authorization, inspection and enforcement, review and assessment, and development of regulations and guides); (f) Implements IAEA safeguards, including an SSAC; (g) Implements import and export control measures for nuclear and radioactive material and items; (h) Establishes compensation mechanisms for nuclear damage.
Examples of how the condition may be demonstrated	Evidence that a comprehensive nuclear law is enacted and promulgated.
Observations The Law *On the Use of Atomic Energy for Peaceful Purposes* No. 565 of 9 September 2019 (‘the 2019 Atomic Energy Law’) regulates relations in the field of the peaceful uses of atomic energy (Article 1). The 2019 Atomic Energy Law establishes the institutional framework for the nuclear power development and the related system of regulatory control and seeks to comprehensively address nuclear safety, security, safeguards and nuclear liability. The law *About Regulatory Legal Acts* No. 682 of 20 April 2021 describes the current hierarchy of legal instruments in the Republic of Uzbekistan (which collectively are referenced as ‘regulatory legal acts’) as follows: 1. International treaties; 2. Constitution of the Republic of Uzbekistan;	

3. Laws and codes;
4. Decrees of the legislative Chambers of the Oliy Majlis (Parliament) (2-4 which collectively are referenced as 'legislative acts');
5. Resolution and decrees of the President;
6. Decrees of the Cabinet of Ministers;
7. Decrees of ministries, state committees and agencies;
8. Decisions of the local government (5-8 collectively are referenced as 'by-laws').

According to the Constitution of the Republic of Uzbekistan, the Cabinet of Ministers ensures the execution of the laws, decisions of the Parliament of Uzbekistan, the Oliy Majlis, and the resolutions and decrees of the President (Paragraph 4, Article 98).

The 2019 Atomic Energy Law provides that norms and rules in the field of the peaceful use of atomic energy (Article 9) consist of regulatory legal acts and technical standards. Uzbekistan's national nuclear legislation is comprised of several laws (e.g. the 2019 Atomic Energy Law, the law *About Radiation Safety* No. 120-II of 31 August 2000, the law *On the Sanitary-Epidemiological Well-Being of the Population* No. 393 of 26 August 2019, and the law *On Wastes* No. 362-II of 5 April 2002); a number of by-laws (e.g. decrees and resolutions of the President on the system of public administration and supervision and on Goskomprombez); and several resolutions of the Cabinet of Ministers (e.g. on Goskomprombez, licensing, state control, supervision including on the state system for accounting and control, examination, safety etc.). The INIR team was informed that the national nuclear legal framework also includes codes (e.g. the Criminal Code) and resolutions of the Oliy Majlis (e.g. the resolution *On the List of Activities for Which a License is Required*).

The 2019 Atomic Energy Law identifies that State regulation of the safety of atomic energy use is carried out by a specially authorized body, identified as the State Committee on Industrial Safety (Goskomprombez) (Article 16) and that state bodies that have separate powers for State regulation of the safety of atomic energy, collectively 'the State regulatory bodies for safety' (Article 10). Pursuant to Article 16, Goskomprombez is entrusted with coordination of the regulatory activities performed by all competent authorities. The procedures for coordination are established in by-laws covering the areas of review and assessment, inspection and licensing, e.g. the Resolution No. 663 (2020) of the Cabinet of Ministers *On Approval of the Regulations on the Procedure for Licensing Activities in the Field of Atomic Energy Use*.

According to the Decree of the President of the Republic of Uzbekistan *About the Organization of Activities of the State Committee on Industrial Safety of the Republic of Uzbekistan* No. DP-4058 of 12 December 2018 (the '2018 Presidential Decree on Goskomprombez'), the Department for Radiation and Nuclear Safety was established as part of Goskomprombez.

According to the Cabinet of Ministers' resolution No. 75 (2019) *On Approval of the Provision of the State Committee on Industrial Safety of the Republic of Uzbekistan* (which inter alia defines the status, main tasks, functions, rights, responsibilities and reporting), the Chair of Goskomprombez is appointed and removed by the President based on the proposal of the Prime Minister, and approved by the Legislative Chamber of the Oliy Majlis. Two deputies of the Chair including the head of the Department of Radiation and Nuclear Safety are also appointed and removed by the President of the Republic of Uzbekistan. The duration of their appointment is unspecified.

The INIR team was informed that the licensing process is as follows: the draft decision, which is based upon inspection(s), review(s) and assessment(s) conducted by Goskomprombez, is proposed to the

Board of Goskomprombez. Following deliberation and approval by the Board, the Chair issues the license or permit.

The INIR team was informed that the supervisory role of the Cabinet of Ministers over activities of Goskomprombez is limited to the provision of regular reports. The INIR team was informed that relevant stakeholders may be invited to the meetings of the Board of Goskomprombez. They can provide further clarification on the application and its supporting documents only.

In line with the 2018 Presidential Decree on Goskomprombez, Goskomprombez is funded by the State budget, and the Ministry of Finance annually allocates the necessary funds and can propose amendment to its annual budget if necessary.

Most of the fundamental principles for safety and nuclear security are explicitly reflected in regulatory legal acts.

The INIR team was informed that following the completion of the adherence process to the Vienna Convention (1963), Uzbekistan plans to amend its legal framework to bring it in line with the provisions of this convention.

Areas for further action	**Significant**	No
	Minor	Reassess and amend the legal framework

RECOMMENDATIONS

None

SUGGESTIONS

S-5.2 Uzbekistan is encouraged to reassess and amend as necessary its legal framework to ensure its overall consistency and that all aspects of a comprehensive nuclear law are adequately addressed.

GOOD PRACTICES

None

5. Legal Framework **Condition 5.3: All other legislation affecting the nuclear power programme reviewed**	**Phase 2**
Summary of the condition to be demonstrated	Legislation has been reviewed and amended as necessary to cover: (a) Environmental protection; (b) EPR; (c) Occupational health and safety of workers; (d) Protection of intellectual property; (e) Local land use controls; (f) Foreign investment; (g) Taxation, fees, electricity tariffs and incentives;

	(h) Funding of long-term liabilities related to spent fuel, radioactive waste and decommissioning; (i) Roles of national and local governments; (j) Stakeholders and public involvement; (k) International trade and customs; (l) Financial guarantees and any other required financial legislation; (m) R&D.
Examples of how the condition may be demonstrated	Presentation of a review identifying relevant laws and evidence that the necessary laws have been enacted, or there is a clear plan to enact them at the appropriate time.

Observations

The Ministry of Justice is responsible for coordination and alignment of draft regulatory legal acts proposed by competent ministries, State committees, and other entities and State authorities.

The INIR team was informed that Tax Code 599 of 30 December 2019 was enacted to meet the needs of the nuclear power programme but a comprehensive review of laws that might affect the programme has not been conducted.

The INIR team was further informed that after concluding the EPC contract, Uzbekistan plans to develop a new law if needed which would incorporate amendments to non-nuclear laws to address any identified issues affecting the nuclear programme.

Areas for further action	**Significant**	Review and amendment of non-nuclear legislation
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

S-5.3.1 Uzbekistan is encouraged to further review other non-nuclear legislation that may have an impact on the nuclear power programme and amend it in a timely manner, as necessary.

GOOD PRACTICES

None

6. Safeguards Condition 6.1: Strengthening of the SSAC underway	Phase 2
Summary of the condition to be demonstrated	The State authority responsible for safeguards implementation is established and has defined roles and responsibilities within the SSAC. Measures are implemented to enhance the SSAC's capability to regulate and control all nuclear activities in the State to ensure that the nuclear material is used only for peaceful purposes, including: (a) To collect, process and report, on time, correct and complete safeguards relevant information to the IAEA; (b) To facilitate IAEA activities and to provide access for IAEA in-field verification; (c) To confirm or verify the information provided; (d) To resolve questions and inconsistencies through institutional arrangements.
Examples of how the condition may be demonstrated	(1) Description of the SSAC roles and responsibilities. (2) Evidence that all organizations involved in the establishment or adjustment of the SSAC are prepared for the increase of activity, the increase of resources and the enhancement of capabilities needed to embark successfully on a nuclear power programme. (3) A plan to develop operation relevant safeguards procedures. (4) A programme in place to build up the required technical and administrative competence on timescales consistent with the development of the nuclear power programme. (5) Evidence through information exchange with the IAEA that the SSAC has a good understanding of the principles of safeguarding an NPP, including the type of equipment the IAEA may install in the facility.

Observations

The state system of accounting for and control of nuclear material (SSAC) is established by the Cabinet of Ministers' Resolution No. 98 of 3 April 2009. Goskomprombez is established as the State authority responsible for safeguards implementation by the Cabinet of Ministers' Resolution No. 179 of 25 June 2009.

The INIR team was informed that out of the 71 positions in Goskomprombez defined by the Presidential Decree No. 4058 (12 December 2018), 28 will work onsite at the NPP in the Division of Supervision for Ensuring Radiation and Nuclear Safety of the NPP, and four of those staff will have safeguards oversight responsibilities. At headquarters, the number of staff in the unit with responsibility for safeguards implementation is planned to increase from three to seven.

Goskomprombez plans to organize safeguards training and re-training for its own staff as well as other state bodies with safeguards responsibilities and licensees. Article 13 of the 2018 IGA on NPP Construction provides for cooperation between the State regulatory bodies and organizations authorized by them on systems for accounting for and control of nuclear materials, including education and training of specialists of Uzbekistan.

Confirmation of safeguards information submitted by licensees to Goskomprombez is issued during inspections of the licensees' activities. The INIR team was informed that these activities include inspection of control measures, visual inspection of items containing nuclear material and consistency checks with accounting documents. Goskomprombez has developed draft guidelines describing the preparation of inspection plans. These guidelines are expected to be adopted in the third quarter of 2021.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

6. Safeguards **Condition 6.2: SSAC requirements for the NPP recognized and addressed**	**Phase 2**
Summary of the condition to be demonstrated	The owner/operator is aware of the requirements of nuclear materials accounting and control, including the necessary staffing, training and technical resources.
Examples of how the condition may be demonstrated	(1) Human technical and financial resource requirements are included in the owner/operator organization plans. (2) Plans to develop the required system and related procedures for collecting, processing and reporting safeguards relevant information.

Observations

As the project progresses, the Directorate for NPP Construction plans to develop its capabilities and infrastructure in the area of accounting for and control of nuclear materials. The national process and procedures for collecting, processing and submitting information required for the accounting of nuclear materials in licensees is reflected in the Cabinet of Ministers' Resolution No. 231 of 13 August 2009 as amended.

The INIR team was informed that under the EPC contract, the NPP operator's organizational unit responsible for nuclear material accounting and control will be placed within its Department of Nuclear Safety. Two persons will be primarily responsible for safeguards implementation in the facility, and all relevant staff will receive training. The Directorate is benefitting from the experience of staff who were involved in safeguards implementation at the VVR-SM and IIN-3M research reactors. In the

management system of the Directorate for NPP Construction, it is planned that authorization will be required to move nuclear material into or out of a material balance area. The INIR team was informed that under the EPC contract, the general contractor will deliver a computerized system for nuclear material accounting and control and that the system should be in place before fuel is delivered to the plant.		
Areas for further action	**Significant**	No
	Minor	International operators' safeguards experience
RECOMMENDATIONS		
None		
SUGGESTIONS		
S-6.2.1 The Directorate for NPP Construction is encouraged to further study the experience of new NPP owner/operators in specifying safeguards requirements and in establishing systems for nuclear material accounting and control.		
GOOD PRACTICES		
None		

6. Safeguards **Condition 6.3: Design information requirements for safeguards recognized**	**Phase 2**
Summary of the condition to be demonstrated	The State has notified the IAEA of its plans for NPP construction, understands the need for early planning of safeguards relevant features in the design and construction phases (including such requirements in the BIS), and plans to submit early design information to the IAEA as soon as the technology has been decided. Any plans for fuel cycle facilities have been communicated to the IAEA.
Examples of how the condition may be demonstrated	(1) Additional protocol [23] declaration (under Article 2.a.x) on 10- year plans for the NPP submitted and regularly updated. (2) Evidence through information exchange with the IAEA that the owner/operator has a good understanding of the principles of safeguarding an NPP, including the type of equipment the IAEA may install in the facility. (3) Information on technology and list of designs being included in the BIS, provided to the IAEA; if a design has already been chosen, design information has been submitted to the IAEA with any specific national variations. (4) Future safeguards requirements for the NPP identified and included in the BIS.

	(5) Any proposals for fuel cycle facilities discussed with the IAEA.

Observations

At the request of Goskomprombez, Uzatom provided preliminary design information for the NPP which was submitted to the IAEA on 10 February 2020. The information includes the identification of the owner/operator, a description of the technology and purpose of the facility, the status of the project including notional dates for construction and commissioning and a map identifying the precise location of the preferred site. Uzbekistan has declared its general plans for its nuclear power programme under Article 2.a.(x) of the Additional Protocol.

The Directorate for NPP Construction is aware of Uzbekistan's obligation to provide a complete design information questionnaire (DIQ) based on preliminary construction plans as early as possible, and in any event not later than 180 days prior to the start of construction.

The INIR team was informed that conformance with the terms of Uzbekistan's comprehensive safeguards agreement and additional protocol, including provisions for the installation of IAEA equipment are specified as requirements in the draft EPC contract.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

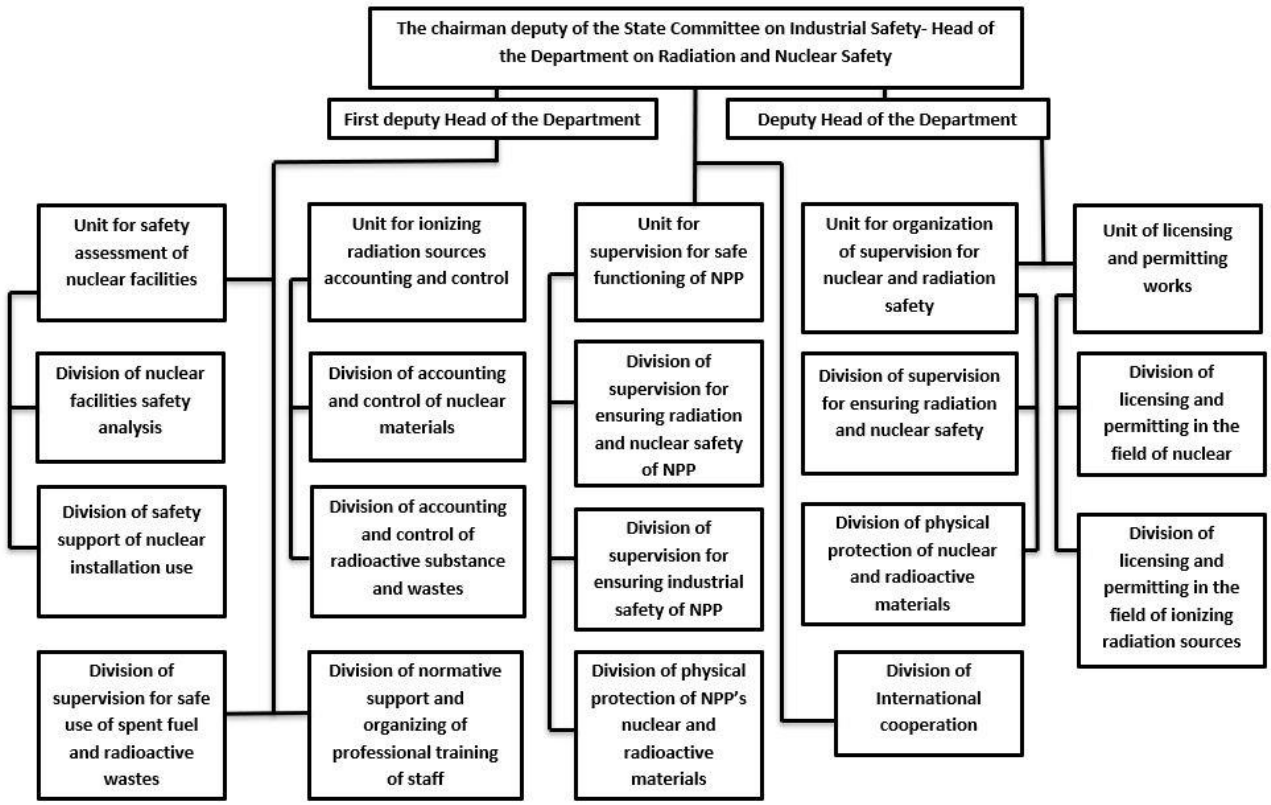
SUGGESTIONS

None

GOOD PRACTICES

None

7. Regulatory Framework **Condition 7.1: Competent, effectively independent nuclear regulatory body established**	**Phase 2**
Summary of the condition to be demonstrated	The regulatory body has the legal authority, technical competence, resources and procedures to fulfil the statutory obligations, and is ready to assess an application for a licence, issue a licence with licence conditions and inspect the construction of the NPP against a clearly defined set of regulatory requirements. Its regulatory decisions are free from undue political and economic influence.
Examples of how the condition may be demonstrated	(1) Demonstration of effective independence, including separation from the promotional aspects of nuclear power. (2) Evidence of adequate human and financial resources, including technical and leadership competence. (3) Processes for communications with the public and liaison with the international community. (4) A documented, formal management system, including roles, responsibilities, organizational structure and processes and record keeping (see infrastructure issue No. 3, management). (5) Technical support organizations and advisory experts available to support the regulatory function. (6) Arrangements for interfaces with operating organizations, other regulatory bodies, transport organizations and international forums. (7) Defined process for the assessment of applications for licence, licence issuance, inspections and enforcement actions. *Note: A report evaluating the regulatory framework against the actions described in SSG-16 would address these conditions with respect to safety. If an IAEA Integrated Regulatory Review Service mission (tailored for embarking countries) has been conducted, the results of this mission could be used as evidence. However, subsequent work on any identified recommendations would be noted but not reviewed in detail, as that would occur during an Integrated Regulatory Review Service follow-up mission.*
Observations Under the 2019 Atomic Energy Act, Goskomprombez was appointed as a specially authorized body for the State regulation of the safe use of atomic energy. Under Presidential Decree No. 4058, the Department on Radiation and Nuclear Safety was established as part of Goskomprombez. The organizational structure of the Department includes 5 units with 14 divisions as shown below.	



As per the existing staffing plan, the number of staff to be recruited by 2020 was envisaged to be 30 while the number currently stands at 20. The INIR team was informed that this is due to budgetary limitations that impact the level of salaries and the ability to fill vacancies. Goskomprombez can use internal and external technical support organizations to support licensing and regulatory oversight.

Goskomprombez is mandated to coordinate its activities with the other state bodies with regulatory responsibilities related to safety, security and safeguards. These are the State Committee on Ecology and Environmental Protection, the Ministry of Emergency Situations, the Ministry of Health, the Ministry of Construction, the State Committee on Geology and Mineral Resources, the State Customs Committee, the Centre of Hydrometeorological Service of the Cabinet of Ministers (Uzhydromet), the Ministry of Internal Affairs, the State Security Service, the Ministry of Defence and the National Guard.

Review and assessment and inspections will be conducted in accordance with national regulations. Norms and standards of the vendor country have been adopted for review and assessment of the design of NPPs. Review and assessment of the application for the site permit and license applications and inspection during construction is planned to be supported by foreign technical support organizations, for example V/O Safety.

Goskomprombez is further developing its competence through a programme of cooperation with Rostekhnadzor. It has also concluded cooperation agreements with Norway and is in an advanced stage of concluding an agreement with Gosatomnadzor of Belarus. Further agreements with relevant organizations in the Republic of Korea, India and Turkey are under development.

Areas for further action	**Significant**	Strengthening competence
	Minor	International experience feedback

RECOMMENDATIONS
R-7.1.1 Goskomprombez should use the time until the review and assessment of the construction license application to strengthen its competence.
SUGGESTIONS
S-7.1.1 Goskomprombez is encouraged to further study international experience in regulatory oversight activities for nuclear power.
GOOD PRACTICES
None

7. Regulatory Framework **Condition 7.2: Regulatory framework developed**	**Phase 2**
Summary of the condition to be demonstrated	The regulatory framework addresses all the relevant aspects for safety, security and safeguards related to siting, design and construction of the proposed NPP (including arrangements for spent fuel, waste management and the transport of radioactive material). The framework will ultimately need to cover all the phases of the programme, but at this stage some aspects (e.g. commissioning, operation, decommissioning) may be covered by future work plans.
Examples of how the condition may be demonstrated	(1) A comprehensive list of regulations identifying those issued, those in draft and those yet to be developed. (2) Evidence showing how the regulations have been developed and how they are consistent with IAEA safety standards, security guidance and safeguards requirements.

Observations

A number of regulatory documents have been approved including:

- Amendments and additions to certain legislative acts of the Republic of Uzbekistan No. 603 dated 22 January 2020. This includes the addition of activities required to be fulfilled by the licensee;
- Regulation *on the Procedure for Oversight and Inspections in the Field of Use of Atomic Energy by the Authorized Bodies*, No. 368 of 10 June 2020;
- Regulation *on the Licensing Activities in the Field of Nuclear Energy*, No. 663 of 28 October 2020;
- Regulation *on the Procedure for Conducting an Examination of the Safety Substantiation of Nuclear Facilities and Activities*, No. 390 of 17 June 2020;
- Resolution of Goskomprombez *On Main Criteria and Requirements for the Safe Placement of Nuclear Power Plants*, No. 03/YB-30 of 25 July 2019 (according to the federal norms and rules in the field of nuclear energy use). NP-032-01 on approved main criteria and requirements for the safe placement of nuclear power plants;
- Recommendations for the formation and maintenance of safety culture in nuclear power plants and in operating organizations of nuclear power plants.

Draft regulations under approval process include:

— Regulation on the approval of the list of nuclear energy facilities that may be owned by the State or owned by legal entities;
— Regulation on approval of the procedure for issuing a site permit for a nuclear installation or storage facility;
— On approval of regulations on issuing a permit for the right to conduct work in the field of nuclear energy use.

Regulatory documents under preparation include as follows:

— Regulations on the training, retraining, advanced training, knowledge testing (certification) of employees of operating organization and other legal entities in the field of nuclear energy use;
— Regulation on approval of the procedure for providing information on the safety status of nuclear installations and (or) storage facilities to the state safety regulatory authorities;
— Regulation on approval of design standards for earthquake-resistant nuclear power plants;
— n approval of requirements for the siting of storage facilities for nuclear materials and radioactive substances;
— Regulation on a procedure for organizing and implementing state control over accounting for nuclear materials;
— Standard programme for the implementation of state control over the accounting of nuclear materials in organizations that handle nuclear materials;
— Recommendations for the formation and maintenance of safety culture in nuclear power plants and in operating organizations of nuclear power plants.

The INIR team was informed about the process for preparing regulations which includes preparation of an initial draft taking into account IAEA Safety Standards and vendor country regulations, seeking and addressing comments from relevant stakeholders and submitting drafts to the Ministry of Justice. The INIR team was informed that the number of regulatory staff in the Division of Licensing and Permitting Work in the Field of Atomic Energy Use is two.

Areas for further action	**Significant**	Regulations and guides
	Minor	Process for developing regulations and guides

RECOMMENDATIONS
R-7.2.1 Goskomprombez should complete the development of the regulations and guides needed to authorize and oversee construction.
SUGGESTIONS

S-7.2.1 Uzbekistan is encouraged to regularly assess and enhance the effectiveness and efficiency of the process for developing regulations and guides.
GOOD PRACTICES
None

8. Radiation Protection **Condition 8.1: Development of radiation protection programmes and expansion of appropriate infrastructures planned**	**Phase 2**
Summary of the condition to be demonstrated	Plans have been developed for programmes to control and monitor the exposure of individuals on-site before any radioactive material arrives on the site, including staff training, procurement of equipment and services, and design requirements. The plans take into account increased requirements during construction and commissioning.
Examples of how the condition may be demonstrated	(1) Plans in place to implement radiation monitoring and protection programmes for exposure of workers and the public on-site before any radioactive material arrives on the site. (2) The appropriate equipment and systems for radiation monitoring are included in the BIS. (3) A review of the national infrastructure for monitoring and recording radiation doses with plans for the required expansion. (4) Evidence of visits to other NPPs to understand the issues of dose and contamination control. (5) Availability of competent staff to review vendor proposals for dose and contamination control.

Observations

The Concept for the Development of Nuclear Energy for the Period 2019-2029 approved by the Presidential Decree No. 4165 includes measures for implementing environmental and radiation protection programmes. Accordingly, the human resources development strategy approved by the Presidential Decree No. 4492, provides for the training of specialists in the field of monitoring and radiation protection.

The INIR team was informed that as part of the negotiations of the EPC contract, the parties discussed and agreed upon the organizational structure of the NPP operator. Training in radiation protection and radiation safety for all staff will be provided.

Radiation protection specialists of the Institute of Nuclear Physics of the Academy of Sciences and the Ministry of Health are supporting Uzatom in the development and implementation of the radiation protection programme.

The regulatory organizations involved in the development, coordination and implementation of the radiation protection programme and the radiological environmental monitoring programme include Goskomprombez, Uzhydromet and the Ministry of Health. Each responsible organization has functions, roles and responsibilities assigned in respective laws and by-laws, and their work is coordinated by the government commission on radiation safety. Goskomprombez is responsible for coordinating the development plans of all involved organizations and reporting to the government on the progress of the implementation of the plans.

The requirements for protection of workers, the general public and the environment including dose limits are based on the existing sanitary norms in Uzbekistan (Ref. No. SanPiN-0193-06) and take into account safety standards described in the IAEA's *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, IAEA Safety Standards Series No. GSR Part 3* (2014) (GSR-3). The radiation norms related to radioactive waste management will follow the norm SanPiN-

0251-08, and radiological environmental monitoring will be conducted in accordance with the norm SanPiN-0361-18.

The INIR team was informed that the Ministry of Health has identified norms and standards that need to be revised and has developed a plan for their review and amendment during the next five years, with prioritization in line with the project development.

Areas for further action	**Significant**	Roles and responsibilities
	Minor	No

RECOMMENDATIONS

R-8.1.1 Uzbekistan should further specify roles and responsibilities regarding implementation and oversight of radiation protection measures and radiological environmental monitoring programmes

SUGGESTIONS

None

GOOD PRACTICES

None

9. Electrical Grid **Condition 9.1: Detailed studies undertaken to determine grid enhancements**	**Phase 2**
Summary of the condition to be demonstrated	An analysis of the grid system has been completed to identify any enhancements needed to: (a) Cope with the enhanced generating capacity; (b) Achieve grid stability and reliability requirements to allow safe and efficient operation of the NPP (ability to reliably take the power generated and provide supplies to safety equipment). The requirements of the planned NPP have been agreed with the transmission system operator and they are compatible with the capability of NPP designs being considered.
Examples of how the condition may be demonstrated	Plans to address the grid requirements associated with the inclusion of the NPP. The plans need to include: (1) Enhancement and/or expansion compatible with the increased generating capacity. (2) Achieving the overall grid stability and reliability requirements for safe operation of the NPP. (3) Justification of the reliability and capacity of the off-site power for the NPP; multiple grid connections to the NPP site, including provisions for their robustness, diversity, physical security and cybersecurity. (4) Grid related plant characteristics and reliability requirements included in the BIS.

Observations

The existing installed electricity generation capacity in Uzbekistan is 12.9 GW. The INIR team was informed that the country transmission network consists of 35 kV to 500 kV transmission lines. A substantial portion of the transmission network assets has been in operation for more than 30 years resulting in grid ageing and an increase in technical losses. The power transmission system is operated by the state-owned National Power Grid of Uzbekistan JSC.

The INIR team was informed that several power generation and transmission studies have been performed or are planned, addressing power transmission network development and the integration of renewable energy sources, master plan of electrical transmission networks, Grid Code, etc. However, technical studies on the interaction between the NPP and the grid have not yet been conducted. For this purpose, a protocol between the Ministry of Energy and Uzatom has been signed. The design institute JSC Sredazenergosetproekt will perform the studies.

The terms of reference of the studies will include all necessary criteria such as grid stability and reliability, transients and frequency control and the requirements for reliable power supply to the NPP. Data needed from the national grid operator and the vendor are not yet available, and this is delaying the development of a scheme for the NPP's power output. These data are essential for identifying and planning the necessary enhancements to ensure that the electrical grid system can accommodate the NPP and provide a reliable power supply for its safe start-up, operation and normal or emergency shutdown.

Areas for further action	**Significant**	Technical grid studies
	Minor	No
RECOMMENDATIONS		
R-9.1.1 Uzbekistan should execute the technical studies in order to assess the necessary grid enhancements.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

9. Electrical Grid **Condition 9.2: Plans, funding and schedule for grid enhancement available**	**Phase 2**
Summary of the condition to be demonstrated	The plans for, and funding of, the identified enhancements are available, and the enhancement programme is consistent with the NPP construction programme.
Examples of how the condition may be demonstrated	(1) Evidence that funding and schedules for grid enhancements, compatible with the foreseen construction, testing and commissioning have been approved and that delivery times of towers, lines and components, substations and switch yards are consistent with the construction schedule. (2) If the grid system will be interconnected to other countries, plans for appropriate legal and commercial agreements and operating procedures are in place for proper control of system frequency after an NPP trip and for grid emergency situations. (3) If the required performance of the future grid is a significant improvement over the current performance, firm and realistic plans exist to ensure this performance will be achieved in time for the commissioning of the NPP.
Observations The Government Portfolio of Investment Projects No. 061-2690 lists priority infrastructure projects related to the nuclear power programme including projects addressing the connection of the NPP to the national power system. The INIR team was informed that these projects are 2–3 years late due to the delay in implementation of the necessary grid studies. A draft decree is being prepared by Uzatom and the Ministry of Energy aimed at coordinating various projects in this area and to establish an overall schedule with estimates of the capital expenditures needed.	

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

10. Human Resources Development **Condition 10.1: Knowledge and skills needed in organizations for Phase 3 and operational phase identified**	**Phase 2**
Summary of the condition to be demonstrated	All relevant organizations have identified an appropriate organizational structure and the staff requirements for Phase 3, and the operational phase and key staff are already in place. The plans need to take into account the staffing requirements for any future units and the strategy for transferring staff between units.
Examples of how the condition may be demonstrated	For each organization (including support organizations), an analysis of what resources and competences are needed at what time during Phase 3 and the initial operational phase and which positions need to be formally licensed. The competence areas need to include: (1) Technical (including those that are nuclear specific); (2) Business (e.g. legal, finance); (3) Licensing; (4) Stakeholder involvement; (5) Fuel cycle management and procurement; (6) Construction management and commissioning; (7) Operation and maintenance; (8) Spent fuel, and radioactive waste management and decommissioning; (9) Training and development (including a systematic approach to training).

Observations

The current staff hiring schedule for the Directorate for NPP Construction is planned to be completed in 2021 bringing the organization to 54 people. In consultation with the vendor, a detailed organizational structure was developed for the construction and operation stages. By the end of Phase 3, it is planned that there will be 1867 staff members, and the INIR team was informed that 863 of them are to be trained under the EPC contract. Staff for the remaining positions, which are less critical for safety and include non-technical positions, will be hired and trained by Uzatom. The INIR team was informed that there are considerations on how to transfer staff between the units.

Uzatom developed a yearly schedule for recruitment with job descriptions which define experience and qualifications needed. Uzatom and the Directorate for NPP construction developed the qualification requirements using those adopted in the Russian Federation as well as the IAEA safety guide on Recruitment, Qualification and Training of Personnel for Nuclear Power Plants, IAEA Safety Standard Series No. NS-G-2.8.

Goskomprombez developed the draft resolution *On Approval of Lists of Positions of Employees and Types of Work for Which it is Necessary to Obtain Permits for the Right to Conduct Work in the Field of Atomic Energy Use.* It covers the following areas: performing work in nuclear facilities, requirements for human resources and certification of personnel. The resolution is expected to be approved by the Cabinet of Ministers in 2021.

The organizational structure of the Department of Radiation and Nuclear Safety of Goskomprombez and a multi-year staffing schedule were approved by the Presidential Decree No. 4058 which provides for 40 new hires between 2024 and 2028 to reach a total of 71 staff.

The INIR team was informed that Uzatom analyzed staffing needs in the non-power applications of the programme including radiation protection and health and submitted proposals to the Ministry of Higher Education.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
GP-10.3.1 Uzbekistan has established a local branch of an experienced university to provide a pipeline of specialists for the nuclear power programme and is coordinating the academic curriculum with that of other higher education institutions in an integrated association. **GP-10.3.2** Uzatom has developed a system to ensure that reserves of talented students and qualified specialists and managers currently employed in other sectors are identified, have received mentoring and training and can be hired rapidly into critical positions in the key organizations, as necessary.		

10. Human Resources Development **Condition 10.2: A plan available to develop and maintain human resources**	**Phase 2**
Summary of the condition to be demonstrated	A gap analysis has been completed (based on the requirements of 10.1, above) and recruitment and training plans developed (for each organization). The plans cover education, training and experience requirements and also include consideration of bilateral and international training activities.
Examples of how the condition may be demonstrated	(1) Training plans for senior executives; (2) Recruitment, training and development programmes to provide the competences defined in 10.1, including: (a) The nature of, and time required for, development of each competence; (b) Proposed courses and location of training; (c) The need for training abroad at a similar operating plant to those being considered, with any necessary language training planned; (d) Programmes in place for the involvement of future operation and maintenance personnel with the construction and commissioning groups;

	(e) The licensing of identified management and operating staff. (3) Proposals for training infrastructure requirements and development of training expertise; (4) The BIS addresses what is required from suppliers, including competence development of national personnel (training and on the job experience), the provision of a simulator and other training infrastructure requirements, and the development of national trainers.

Observations

The national human resource development (HRD) strategy outlines activities for continuous training of personnel for the period 2019–2030 for all organizations as well as measures to retain staff. The strategy includes NPP staffing plans until the plant start-up.

The plan for the recruitment and training of NPP personnel for the construction period - approved by the Minister of Energy -lays out on a quarterly basis the number of staff to be recruited and the training schedule. Recruitment process requirements have been developed. The plan covers initial training, re-training and advanced training.

The INIR team was informed that the training included in the EPC contract will be carried out at the Rosatom Technical Academy and at the reference plant (Novovoronezh NPP-2) and will include shadow training. During the commissioning period up to the startup of the Unit 1, the operating personnel will work under supervision of personnel provided by the vendor country. The supervisors will make recommendations on the ability of the trained personnel to operate the NPP independently.

The personnel for the second unit will be trained at the reference plant and undergo shadow training at Unit 1 before the startup of Unit 2. The vendor country will organize training workshops on management, nuclear safety and security, including on the application of the adopted set of Russian Federation norms and regulations. The INIR team was informed that the EPC contract includes establishment of an NPP training centre with simulators, mock-ups and other technical training aids.

Under the MoU signed between the Academy of Sciences of Uzbekistan, Uzatom and ROSATOM, specialists from Uzatom and the Directorate for NPP construction are being trained. The training plans are reviewed on a yearly basis. Uzbekistan is exploring options for cooperation with Belarus to use their experience.

The INIR team was informed that the action plan for the regulatory bodies covers staff development needs up to 2028 for all relevant regulatory bodies (e.g. Goskomprombez, the Ministry of Health and the Ministry of Environment). The training programme with Rostekhnadzor covers on-the-job training at NPPs and research reactors, joint inspections, trainings on review and assessment, and participation in seminars and workshops funded by the Government of Uzbekistan. The Cabinet of Ministers is receiving quarterly reports on the implementation from Goskomprombez as the responsible organization.

The INIR team was informed that due to changes in the salary scale and subsequent cutting of vacancies, the filling of 10 vacancies in Goskomprombez has been deferred. Goskomprombez is developing a proposal to the government to address this issue.

Areas for further action	**Significant**	Staffing of the regulatory body

	Minor	No
RECOMMENDATIONS		
R-10.2.1 The Government should ensure adequate human and financial resources for the Department of Radiation and Nuclear Safety of Goskomprombez in line with the needs of the NPP project.		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

10. Human Resources Development **Condition 10.3: An integrated national strategy developed**	**Phase 2**
Summary of the condition to be demonstrated	The plans of the different organizations (including educational institutions, research organizations and technical support organizations) have been considered in an integrated manner so as to optimize the development programme.
Examples of how the condition may be demonstrated	(1) Integration of the plans of the individual organizations (including support organizations) to enable development of a national strategy including: (a) An appropriate balance of resources and competence between the operating organization, regulator and specialist organizations with adequate training provision in each; (b) A long-term strategy to ensure sustainable, competent resources for each organization; (c) A remuneration structure that will ensure that all organizations are adequately staffed and that staff are retained; (d) Integrating and optimizing opportunities for training abroad; (e) Confirming the adequacy of national education infrastructure (at the secondary and tertiary levels) or identifying any necessary improvements. (2) Evidence that key stakeholder organizations have participated in the development and review of the above plan.
Observations All key organizations were involved in the elaboration of the national human resource development strategy for the nuclear power program, which was approved by Presidential Decree No. 4492. The Cabinet of Ministers is apprised on a quarterly basis on the status. The Minister of Energy is responsible for coordination of the strategy, and the heads of relevant state bodies are responsible for its implementation.	

The strategy underlines the importance of safety culture and of having highly qualified personnel at the NPP, Goskomprombez and other state bodies involved in the nuclear power programme. It addresses the needs of all organizations supporting the nuclear power programme including technical support organizations like the Academy of Sciences.

The action plan for implementing the strategy focuses on both short and long-term staffing needs and includes coordination with relevant institutions in the vendor country. As part of the action plan, Uzatom has developed a system to ensure that reserves of talented students and qualified specialists and managers currently employed in other sectors are identified, have received mentoring and training and can be hired rapidly into critical positions in the key organizations, if necessary.

A plan approved by the Uzatom Director General establishes an association of universities and institutes of higher education responsible to develop and align education and training programmes supporting the nuclear power programme. In consultation with the vendor, a list of required specializations was developed and shared with the association to enable them to adapt their educational programmes to meet the needs.

The association includes the Tashkent branch of the National Research Nuclear University MEPhI, which was established in 2018 to provide bachelors and masters graduates for the nuclear power programme. The national plan provides for the education of students in the Tashkent branch of MEPhI and the MEPhI university in Moscow. All graduates funded by the government commit to work for at least 5 years in the nuclear power programme.

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

11. Stakeholder Involvement **Condition 11.1: Stakeholder involvement plans being implemented**	**Phase 2**
Summary of the condition to be demonstrated	Each of the key organizations (government, regulator and owner/operator) has a proactive stakeholder involvement plan that is in use and regularly updated.

Examples of how the condition may be demonstrated	(1) Documented stakeholder involvement strategy and plan for each of the key organizations (government, regulator and owner/operator) addressing the full range of issues, including technology choice, safety, security, waste management, severe accidents, health and environmental impact. (2) Evidence of a competent communications team in each organization, with experience and evidence of engagement with senior staff. (3) Examples of communications in a range of formats with the public, local government, industry, media, non-governmental organizations, opposition groups, educational institutions and neighbouring countries. (4) Evidence of training and experience of spokespersons. (5) Evidence of ongoing government communications with regard to energy policy and energy needs, the role of nuclear power in the energy mix, the benefits and risks of nuclear power, the non-zero potential for severe accidents and response to issues raised. (6) Regular reviews of public understanding and acceptance through means such as opinion polls or meetings. (7) Effective public information centres in place or planned, including required budgets and facility design. (8) Evidence that the owner/operator engages, on a regular basis, with local stakeholders on, for example, construction plans, opportunities for local jobs and benefits to the community. (9) Regulator strategy regarding the availability of information to the public, regulatory communication and consultation with stakeholders. (10) Evidence that the role of the regulator is understood by stakeholders and that it is perceived as competent and independent.

Observations

Presidential Decree No. DP-4165 (2019) provides for ensuring transparency and openness to the public on the country's nuclear power program. The INIR team was informed that media plans and public information activities of s state bodies, including Uzatom and Goskomprombez, are annually approved by the Security Council under the President. In line with its approved media plan, Uzatom is developing a range of stakeholder involvement activities, including briefings, festivals, and other public outreach events. Uzatom's press service coordinates the activities, and the job descriptions of its employees are defined. Uzatom also has a communication plan with Rosatom, which is updated annually.

Uzatom has held two public events near the NPP site to explain the project and provide information about nuclear power. In 2019, an Information Center for Nuclear Technologies (ICAT) was opened at Uzatom headquarters in Tashkent, and another is planned at the NPP site. The INIR team was informed that Uzatom organizes stakeholder involvement activities for the Directorate for NPP Construction. After the establishment of the information centre at the NPP, the Directorate also plans to hold separate media events with relevant communities, including neighbouring countries.

Uzatom has organized tours to the construction site, information centres and operating NPPs in other countries, Chernobyl and Fukushima for a wide range of stakeholders, including the press, members

of the Oliy Majlis and national Security Council, non-governmental organizations and the local population. The Ministry of Energy holds regular press conferences and briefings. The status of the nuclear power project is regularly posted on the Ministry of Energy and Uzatom websites, news agencies, and social media.

At the request of Uzatom, the State Center for the Study of Public Opinion has been conducting public opinion research since 2019. Surveys were carried out in all regions of Uzbekistan, and the results were reported to the Government. The last survey in March 2019 showed that 71% of the population supports the nuclear power program, 5.8% are against it, and 23.2% are undecided. The INIR team was informed that individual comments received are reviewed and addressed, and survey results are analyzed to improve stakeholder involvement plans.

Goskomprombez communicates with a range of stakeholders including state bodies, licensees and the public. Documents for public comment such as draft regulations are posted in an internet portal, and feedback is collected. The Ministry of Justice reviews the alignment with other legislation and ensures that public comments have been addressed. The public information activities of Goskomprombez include the participation of senior officials of the Department of Radiation and Nuclear Safety in TV programmes and radio broadcasts. Goskomprombez has a press secretary who is responsible for public communication.

The INIR team was informed that all heads of Public Relations departments in the governmental bodies and agencies are trained annually and certified every three years by the Agency of Information and Mass Communications. Uzatom organizes annual training on communication skills for staff, including technical staff, delivered by external experts. These events are open for Goskomprombez staff. Leaders in the organizations have knowledge and experience communicating with the media and the public.

Areas for further action	**Significant**	No
	Minor	Operator stakeholder involvement plan

RECOMMENDATIONS

None

SUGGESTIONS

S-11.1.1 The Directorate for NPP Construction is encouraged to put in place a stakeholder involvement plan in line with the progress of the project.

GOOD PRACTICES

None

11. Stakeholder Involvement **Condition 11.2: Stakeholder involvement plans coordinated**	**Phase 2**

Summary of the condition to be demonstrated	The NEPIO provides a continuing forum for communication and cooperation among the key organizations, ensuring that the roles and responsibilities of each organization in stakeholder involvement are clear and that all stakeholders are being involved (including the

	public, local government, industry, media, non-government organizations, opposition groups and neighbouring States).
Examples of how the condition may be demonstrated	(1) Integrated national strategy agreed among the key organizations, with a commitment to share plans and to ensure consistency of messages. (2) Evidence of regular review by the key organizations of the effectiveness of the strategy.

Observations

Uzatom's coordination role with state bodies including local governmental authorities is outlined in the Cabinet of Ministers' Resolution No. 653. The main role of the Scientific, Technical and Expert Council is to coordinate the activities of state and economic management bodies, local governmental bodies, citizens' self-governing bodies, higher educational institutions, scientific research, design and survey organizations. Working groups in the Republican Working Commission, which include government and local state representatives, also have responsibilities for stakeholder interaction.

The INIR team was informed that Uzatom is coordinating a national stakeholder involvement strategy which is under development by an interagency working group. The strategy will include stakeholder mapping, as well as assigning roles and responsibilities among the key organizations. Coordination will be implemented through protocols of interaction to be signed between the key organizations. The INIR team was informed that in order to ensure consistency of messages of the key organizations appropriate coordination mechanisms are planned to be included in the strategy. The team was informed that upcoming capacity-building support to developing a stakeholder engagement strategy is planned.

Areas for further action	**Significant**	National stakeholder involvement strategy
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

S-11.2.1 Uzatom is encouraged to finalize the national stakeholder involvement strategy coordinated with the regulator and the operator.

GOOD PRACTICES

None

12. Site and supporting facilities Condition 12.1: Detailed site characterization completed	Phase 2
Summary of the condition to be demonstrated	The basis for the site selection has been justified against clearly defined siting criteria. These cover safety, engineering, security, environmental, emergency response, social and economic aspects. Site characterization and an evaluation by the regulatory body have been completed (the detailed approach will depend on the specific authorization stages defined in the State). Site related design basis information is available and included in the NPP requirements. A plan for addressing the siting of fuel cycle and waste facilities is available.
Examples of how the condition may be demonstrated	(1) A report demonstrating the ranking of possible sites and basis of the chosen site or sites. (2) Evidence that the site meets all siting requirements and the necessary characterization studies have been completed (see publications listed below for list of topics to be addressed). (3) Evidence that local legal, political and public acceptance issues have been identified and resolved or their resolution is planned. (4) Analysis of sites required for fuel interim storage, and for waste conditioning, storage and, where appropriate, disposal; plans for selecting sites available. (5) Evidence that, where appropriate, transport between the NPP and any waste storage/disposal sites has been considered.

Observations

Uzatom conducted site survey and site selection activities using norms and standards of the Russian Federation as well as the IAEA's requirements and guides. Seven potential sites were identified: four sites located in the area of the Tudakul reservoir, and three sites located in the Jizzakh region. A site near the Lake Tuzkan in the Jizzakh region was selected as the priority site and a site 4 km away was selected as a reserve site.

The second stage site engineering surveys were completed to collect and verify the site characterization data reconfirming the results.

According to the 2019 Atomic Energy Act, Goskomprombez is responsible for issuing site permits for nuclear facilities after review and assessment of the site evaluation report. The procedure for review and assessment is defined in the Resolution of the Cabinet of Ministers No. 390 of June 17, 2020.

The INIR team was informed that according to the draft procedure for obtaining a site permit, the applicant has to present the approved EIA, the site evaluation report and the quality assurance programme for site selection and evaluation activities.

Uzatom is developing the site evaluation report. This will include a description of the selected technical solutions based on the reference plant design and the results from the site selection and characterization activities to be used as site-related design basis information.

The INIR team was informed that Goskomprombez plans to use external experts to support the review and assessment of the site permit application. Upon receiving satisfactory results of the assessment, Goskomprombez will issue the site permit. The INIR team was informed that the EIA specifically analyzed potential human-induced external events in the 30 km surrounding zone and the suitability of the site for implementing the necessary emergency response measures based on a set of potential internal and external accident scenarios. The INIR team was informed that future off-site spent fuel storage is planned adjacent to the NPP site to minimize transport operations.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

12. Site and supporting facilities **Condition 12.2: Plans in place to prepare site for construction**	**Phase 2**
Summary of the condition to be demonstrated	Infrastructure either exists, or is planned, to support construction, for example access, workforce housing, water and construction materials. Any outstanding work is planned in accordance with the construction requirements or is included in the BIS.
Examples of how the condition may be demonstrated	(1) A review of the current infrastructure and plans to implement any enhancements required. (2) Existing and planned site facilities are clearly described in the BIS.
Observations According to the terms of the 2018 IGA on NPP Construction, the necessary external infrastructure is the responsibility of the Uzbek side. The on-site infrastructure is the responsibility of the EPC contractor. The INIR team was informed that the division of responsibilities between the parties to the EPC contract for establishment of the site infrastructure is well defined. The arrangements address	

interfacing activities such as ensuring fire protection service, and assessments and upgrades of the transportation logistics infrastructure.

Plans for infrastructure development are presented in the roadmap approved by the Presidential Decree No. 4048 of 4 December 2018. The development of infrastructure will proceed in parallel with the NPP construction activities. The Government approved a portfolio of relevant investment projects addressing the following:

— Ensuring electric power supply and connections to power distribution system;
— Construction of roads and railways;
— Construction of water supply and sewage/sanitation system;
— Construction of fibre-optic communication lines;
— Construction of social and accommodation facilities for employees involved in the construction and operation of the NPP.

The INIR team was informed that design work for infrastructure improvements is ongoing. Activities are expected to intensify following the approval of a draft Decree of the Cabinet of Ministers on Measures for Construction of External Infrastructure, which was prepared in 2020. It is currently being reviewed by the relevant ministries and organizations responsible for implementation: National Electric Grid of Uzbekistan, Uzbekistan Railways, the State Committee for Roads, and the Ministry of Housing and Communal Services and Uzbektelecom.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

13. Environmental Protection Condition 13.1: Environmental impact assessment performed	Phase 2
Summary of the condition to be demonstrated	A complete assessment of the environmental impact of the proposed NPP has been carried out in accordance with national requirements and an environmental impact assessment report has been submitted to the appropriate authority. Plans for monitoring to provide a baseline for the site and its surroundings have been developed.
Examples of how the condition may be demonstrated	(1) Availability of the environmental impact assessment report and the status of approval by all relevant regulators and agencies; (2) Mitigation measures evaluated. (3) Plans to develop systems and facilities for necessary environmental monitoring (including radiation monitoring), with clearly assigned roles for the operating organization and the environmental regulator.

Observations

In accordance with national environmental legislation, the environmental impact assessment (EIA) process consists of four stages. The INIR team was informed that in the first stage, after the site is selected, the applicant submits the EIA application to the State Committee for Ecology and Environmental Protection for review and approval. During the second stage, if additional environmental studies are required, the applicant performs the required studies and submits a second stage EIA application. If the review results from first or second stage (if necessary) are approved, the applicant may begin construction activities. The third stage occurs prior to the commissioning of the NPP and requires an EIA for the completed facility. The fourth stage sets the operational environmental limits.

In February 2020, the institute JV UzLITI Engineering LLC and the institute JSC Orgenergostroy (Russian Federation) completed the first stage EIA for the selected NPP site. The terms of reference for the first stage EIA was developed applying the Russian Federation norms and standards, accepted by the State Committee of for Ecology and Environmental Protection and approved by the Deputy Prime Minister in August 2018.

Currently the Center for State Environmental Expertise is conducting the first stage EIA assessment. The INIR team was informed that participation of external consultants in this assessment is considered necessary and corresponding arrangements are being made.

The Prime Minister approved an EIA action plan for involving the public, including the conduct of public hearings. For that purpose, a non-technical summary of the first stage EIA was developed and agreed at the meeting of the Scientific, Technical and Expert Council of Uzatom. The INIR team was informed that as per the environmental legislation, the application for the first stage EIA assessment and approval will be supplemented by an assessment of the results of the public hearings.

Uzatom is working on the preparatory activities to conduct public hearings. The INIR team was informed that information materials have been developed and venues have been selected. The implementation of the hearings was delayed due to COVID-19 restrictions on public gatherings and hearings will be held once restrictions are lifted.

After the completion of the public hearings and approval by the State Committee on Ecology and Environmental Protection, the first stage EIA together with the developed site evaluation report will be submitted to Goskomprombez for assessment and for issuance of the site permit. The INIR team was informed that Uzatom is planning arrangements for environmental monitoring systems once the site permit is issued.		
Areas for further action	**Significant**	EIA public hearings
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
S-13.1.1 Uzatom is encouraged to conduct public hearings in order to complete the EIA process.		
GOOD PRACTICES		
None		

13. Environmental Protection **Condition 13.2: Environmental characteristics provided**	**Phase 2**
Summary of the condition to be demonstrated	Comprehensive specification of environmental site conditions, factors, characteristics and data have been included in the BIS in as much detail as possible.
Examples of how the condition may be demonstrated	(1) BIS identifying local environmental factors. Areas to consider include: (a) Pathways for effluent transport and concentration in the surrounding environment; (b) Local population demographics and trends; (c) Predominant plant and animal life and relevant radioecological sensitivities; (d) Predominant land use; (e) Data relevant to justifying heat removal capability; (f) Sites and means for disposal of hazardous waste; (g) Local environment issues affecting construction. (2) Bidders have free access to all detailed site studies including environmental impact assessment documents and collected site data, with the environmental limitations, commitments and conditions. (3) Established procedure for resolution of vendor questions with regard to the interpretation of the site data.

Observations The NPP technical specification includes a comprehensive list of conditions, factors, characteristics, processes and phenomena which have to be accounted for in the NPP design. The site selection is conducted in accordance with the relevant IAEA Safety Standards and norms and standards of the Russian Federation. Environmental conditions and site characteristics have been defined by the engineering and environmental surveys carried out during the site selection process. The environmental surveys considered also social-economic factors, population density and patterns, plants and animal life and pathways for effluent transport and concentration within the area of 30 km radius. Uzatom also has arrangements for monitoring the meteorological, radiological and seismological site conditions before the monitoring systems for operation are installed.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

13. Environmental Protection **Condition 13.3: Clear and effective regulation of environmental issues established**	**Phase 2**
Summary of the condition to be demonstrated	The environmental regulator for the nuclear power programme has the skills and resources required to fulfil the roles and responsibilities assigned. The interface between this organization and the nuclear regulator has been defined.
Examples of how the condition may be demonstrated	(1) Roles and responsibilities of the environmental regulator for the NPP defined. (2) Memoranda of understanding between the environmental and nuclear regulatory bodies. (3) Evidence of adequate skills and resources to evaluate the environmental impact assessment, plans to develop adequate skills to assess the acceptability of design information, inspect/audit activities during construction and evaluate monitoring results.
Observations	

The national legislation defines the roles and responsibilities of Goskomprombez and the State Committee on Ecology and Environmental Protection related to the NPP project.

By Decree № 541 of the Cabinet of Ministers dated 7 September 2020, environment impact applications submitted to the State Committee on Ecology and Environmental Protection are subject to assessment by the Center for State Environmental Expertise under the environmental regulator. The INIR team was informed that staff and external experts have the competence to evaluate EIAs for large-scale industrial projects.

To assess the radiological part of the first stage EIA, the Center for State Environmental Expertise established an expert working group. All state bodies with competence in this area, including the Ministry of Health, the State Committee on Ecology and Environmental Protection, Goskomprombez and the Customs office as well as research institutes are part of this working group.

After the completion of the assessment by the State Committee on Ecology and Environmental Protection, the first stage EIA application will be submitted to Goskomprombez as part of the design documentation.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS
None
SUGGESTIONS
None
GOOD PRACTICES
None

14. Emergency Planning **Condition 14.1: Responsibilities of each organization clearly defined and approach for emergency planning being developed**	**Phase 2**
Summary of the condition to be demonstrated	An overall action plan is being implemented to provide the required EPR arrangements and capabilities to be demonstrated before fuel is brought to the site. The organizations involved have identified the resources that will be required to execute the action plan and have made a commitment to provide those resources.
Examples of how the condition may be demonstrated	(1) Action plan that addresses the gaps and leads to a demonstration of adequate EPR arrangements and capabilities prior to fuel being brought to site, including: (a) Actions to be completed, schedule and milestones; (b) Organizations responsible for each action; (c) Resources required for the implementation of the action plan; (d) Action plan implementation progress report. (2) Regulations related to EPR developed; (3) EPR roles and responsibilities at all levels are documented; (4) The types of accident have been identified and potential consequences have been assessed including the likely size of emergency planning zones and distances for an NPP; (5) A generic protection strategy has been defined based on assessed hazards and consequences.

Observations

Uzbekistan has a framework for emergency preparedness and response to nuclear and radiation accidents which is established by the Cabinet of Ministers Resolution No. 515 of 26 August 2020. The State System of Emergency Prevention and Response is organized as a three-level structure with components existing at the facility, local and national levels. The Government has identified the organizations with responsibilities for emergency preparedness and response.

The primary responsibilities, as they relate to the future NPP, are assigned as follows:

— The Ministry of Emergency Situations serves as the focal point for the implementation of the national emergency response system, which is intended to provide an effective response to all types of emergencies. The Ministry operates the National Crisis Center and coordinates emergency response activities. It also maintains specialized radiological emergency response teams and can deploy a mobile command post to accident location. The Ministry of Emergency Situations prepares and conducts annual emergency response exercises;

— Goskomprombez develops regulatory documents, and reviews and approves the Operator's on-site emergency plan. It ensures that Uzbekistan's emergency response regulatory framework is consistent with the IAEA's safety standards as described in the publication *Preparedness and Response for a Nuclear or Radiological Emergency, IAEA Safety Standards Series No. GSR Part 7* and EPR-METHOD (2003). During an emergency, Goskomprombez will provide technical monitoring and facilitate coordination. The INIR team was informed that Goskomprombez plans to establish an emergency operation centre with assistance from the VO Safety. Following Uzbekistan's planned adherence to the Early Notification Convention, Goskomprombez will be

the national point of contact for notifying the IAEA and requesting assistance under the Assistance Convention;

— The Operator is responsible for the development and implementation of the on-site emergency plan. The Operator has the primary responsibility for on-site emergency response activities. According to the EPC contract, the on-site centre will be remotely linked to Rosatom's emergency response centre for timely access to technical information and expert advice. The INIR team was informed that the Ministry of Energy and Uzatom are responsible for ensuring the readiness of the emergency response organization of the Operator, including personnel training;

— The local government (Khokimiyat) is responsible for the local response plan and emergency actions to protect the population.

The coordination of activities and organization of effective interaction of ministries and agencies for the prevention of and response to nuclear and radiological accidents, as well as for radiation monitoring is carried out by the Commission on Radiation and Nuclear Safety under the Cabinet of Ministers. Goskomprombez serves as the working body of the Commission.

The Government has developed an approach to emergency preparedness and response on the basis of the probability and severity of different types of emergencies. In establishing the requirement for the EPR program for the planned NPP, Uzbekistan will use IAEA's GSR Part 7, GSR Part 3, EPR-METHOD (2003) and SanPiN-0193-06 *Requirements for Radiation Safety*. The size of the emergency planning zones (EPZ) will be determined by the standard No. MU 1.3.206.027.0017-2010 Calculation and Analysis of the Size of the EPZ and Monitoring Areas Around an NPP. These standards and basis will be included as a technical specification for the NPP project design and reflected in the EPC contract.

Uzbekistan's emergency response framework comprises of requirements for development of on-site and external emergency plans. The external plan will be developed by the local government in coordination with the Ministry of Emergency Situations and approved by the Cabinet of Ministers. The plan will define the response measures to protect the population. The on-site emergency plan will be developed by the Operator and reviewed by Goskomprombez. The two plans must be approved and tested at least six months prior to fuel arrival on the site. The plans will be harmonized through the established coordination mechanisms.

Uzbekistan is party to the Commonwealth of Independent States' Agreement on Cooperation to Ensure the Readiness of the Response to a Nuclear Accident or a Nuclear Radiation Emergency and Assistance in Addressing Their Consequences (CIS Agreement, 2 November 2018, Astana). The INIR team was informed that Uzbekistan is actively working with the Russian Federation, the Republic of Belarus and other CIS Agreement partners to conduct training and exercises and exchange technical information and good practices. The CIS Agreement establishes a notification mechanism to facilitate communication with the neighbouring countries in the event of emergency. Uzbekistan's planned adherence to the Early Notification Convention will further enhance its ability to notify and cooperate with the IAEA and its Member States during nuclear emergencies.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None
SUGGESTIONS
None
GOOD PRACTICES
None

15. Nuclear Security Condition 15.1: Required physical protection measures developed	Phase 2
Summary of the condition to be demonstrated	The national threat assessment and design basis threat for the NPP have been completed. Requirements for the design of physical protection for the NPP have been defined in the BIS or in other appropriate documents. Specific physical protection requirements during the construction and transport of nuclear material have also been developed. Roles and responsibilities for preparing for, detecting and responding to nuclear security events have been defined.
Examples of how the condition may be demonstrated	(1) A documented national threat assessment that covers the full range of threats affecting nuclear material and nuclear facilities. (2) A competent authority defined with assigned responsibility for developing the design basis threat in coordination with other relevant authorities. (3) Clear definition of roles and responsibilities for each organization involved in the response to nuclear security events. (4) A design basis threat has been developed; the BIS includes physical protection requirements for the NPP. (5) Nuclear security requirements during the construction and transport of nuclear material have been defined.

Observations

According to the 2019 Atomic Energy Law, the implementation of the physical protection system at the NPP is the responsibility of the Directorate for NPP Construction, the State Security Service, the National Guard, the Ministry of Defence and the Ministry of Interior. The interagency working group, established by the Presidential Decree dated 5 December 2018 under Uzbekistan's Security Council, develops the overall policy and coordinates physical protection activities for all critical infrastructure in Uzbekistan including the NPP.

The lead regulatory authority for physical protection is Goskomprombez, which is responsible for the development of the associated regulations and the conduct of inspection activities. Additionally, the Ministry of Interior, the State Security Service, the Ministry of Defence and National Guard have regulatory oversight functions in their respective functional areas. These agencies will discharge their oversight responsibilities in coordination with Goskomprombez. The coordination mechanism is established by the Security Council and is subject to continuous improvement.

The Security Council's interagency working group has completed a national threat assessment and developed an 'Adversary Model' document, which contains a radiological sabotage design basis threat (DBT) and was approved in accordance with the established process. The DBT is specific to the future NPP and addresses external attacks, insider threats and cyber threats. The DBT is reviewed annually or as required based on changes in the threat environment. Uzbekistan follows the IAEA nuclear security guidance for the DBT processes.

Uzbekistan has developed a concept of high radiological consequences, which will be used in the development of physical protection measures. The criteria will be consistent with the occupational exposure limits and will be finalized according to the existing plans. Uzbekistan also plans to conduct a sabotage-scenario analysis to determine safety equipment that need to be protected against the DBT

in order to preclude the defined high-radiological consequences. The analysis will be conducted by the national authorities and it will be supported by organizations from the Russian Federation . The analysis will use the sabotage scenarios defined in the DBT.

In consultation with Uzatom, organizations identified by the EPC contractor will design, manufacture and implement the construction, installation and commissioning works necessary for the NPP physical protection system consistent with the IAEA recommendations described in the *Nuclear Security Recommendations on Physical Protection of Nuclear Materials and Nuclear Facilities (INFCIRC225/Rev 5), IAEA Nuclear Security Series No. 13* . These activities will be executed under a dedicated contract on the implementation of the physical protection system as an element of the NPP project contractual framework. The INIR team was informed that in developing the physical protection system, the participating organizations will use the regulatory documents and requirements of the Russian Federation. If necessary, the parties can exchange sensitive nuclear security information based on the 2003 intergovernmental information sharing agreement.

The transportation security measures for the delivery of fresh fuel are determined in the EPC contract. The physical protection measures during the construction of the NPP will be contracted separately.

To address the cyber threats to the NPP, Uzbekistan will use the IAEA recommendations contained in INFCIRC/225/Rev. 5. Presidential Decree No. 4452 of 14 September 2019 established the Center for Cyber Security, which is responsible for the protection of critical infrastructure including the NPP.

The National Guard will provide response forces and has the primary responsibility for the contingency response. Based on the established practices and consistent with the Security Council guidance, the effectiveness of response will be evaluated annually by conducting exercises on-site or at specialized testing and training facilities. The INIR team was informed that Uzbekistan plans to ensure coordination of contingency and emergency plans. Procedures and processes for contingency plan testing will be developed later in the project.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

GP-15.1.1 The availability of an information sharing agreement between the supplier country and the recipient country is essential to the parties' ability to exchange sensitive nuclear security information required to design and develop the NPP's physical protection system.

15. Nuclear Security Condition 15.2: Programmes in place for the management of sensitive information		Phase 2
Summary of the condition to be demonstrated	For each of the key organizations, a process for categorization and management of sensitive information has been developed. This includes control of any sensitive information made available to contractors.	
Examples of how the condition may be demonstrated	Processes for the protection of sensitive nuclear security information and protection of computer systems, networks and other digital systems that store sensitive information.	
Observations Uzbekistan's Law on Informatization, No. 560-II, 11 December 2003, addresses the topics of information security and protection of computer systems and networks. It complements the 1993 Law on the Protection of State Secrets, No. 848-XII, 7 May 1993. There is a formal process for creating and managing confidential information of various categories. The State Security Service provides the required technical support to state agencies, oversees and implements vetting of personnel with access to national security information. In accordance with the 2003 information sharing agreement with the Russian Federation, Uzbekistan authorities are planning the measures needed to provide sensitive information to staff and contractors during the contract execution.		
Areas for further action	**Significant**	No
	Minor	No
RECOMMENDATIONS		
None		
SUGGESTIONS		
None		
GOOD PRACTICES		
None		

15. Nuclear Security Condition 15.3: Programmes in place for the trustworthiness of personnel		Phase 2
Summary of the condition to be demonstrated	For each of the key organizations, a screening/vetting process for recruitment and selection of personnel with access to facilities, nuclear material and sensitive information has been developed.	
Examples of how the condition may be demonstrated	Processes for the screening/vetting of personnel, including a graded approach depending on the level of access required.	

Observations

In accordance with the 1993 Law on the Protection of State Secrets, Uzbekistan has established formal personnel vetting procedures, which are being used during Uzatom and Goskomprombez's hiring processes. The scope of vetting depends on the level of access required by the applicant. Additionally, Resolution of the Cabinet of Ministers No. 663, 28 October 2020 On Licensing of Nuclear Energy Activities, established requirements and processes for conducting trustworthiness investigations when hiring personnel in safety-related positions in the Directorate for NPP Construction. Goskomprombez will be involved in the oversight of relevant aspects of the trustworthiness programs, including behavioural and psychological evaluations.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

15. Nuclear Security **Condition 15.4: Programmes in place for promotion of nuclear security culture**		**Phase 2**
Summary of the condition to be demonstrated	All relevant organizations understand the importance of a nuclear security culture and have plans to develop a nuclear security culture at all levels of the organization.	
Examples of how the condition may be demonstrated	Evidence of the promotion of a security culture by leaders and managers within all key organizations involved in the nuclear power programme, including recognition of the importance of integrated management systems and leadership for security, security of information and trustworthiness.	

Observations

In March 2020, Goskomprombez and the IAEA conducted a national workshop on nuclear security culture, which was attended by the relevant national organizations and governmental agencies . Based on the results of the event, a decision was made to create a work plan along with an associated timetable, for the development of nuclear security culture in Phase 2 of the NPP project. Additionally, Uzbekistan is working to develop a decree entitled *Recommendations for the Development and Maintenance of Nuclear Security Culture at Nuclear Power Plants*. The document was under review.

Areas for further action	**Significant**	No
	Minor	Nuclear security culture

RECOMMENDATIONS

None

SUGGESTIONS

S-15.4.1 Uzbekistan is encouraged to pursue best practice exchanges with partner countries in the area of nuclear security culture.

GOOD PRACTICES:

None

16. Nuclear Fuel Cycle **Condition 16.1: Front end fuel cycle strategy defined**		**Phase 2**
Summary of the condition to be demonstrated	Based on the national policy, a clear front end fuel cycle strategy has been defined identifying how new fuel will be available in the short and long term or which options are being pursued.	
Examples of how the condition may be demonstrated	(1) A document defining a realistic front end nuclear fuel cycle strategy at a level of detail appropriate for Milestone 2. (2) Evidence that basic decisions needed for Milestone 2 have been made. This includes a decision on the number of reloads to be requested with the first core, and a short and long term purchasing strategy for the fuel services (natural uranium, conversion, enrichment and fuel manufacturing). (3) An integrated plan for bidding and construction of any intended front end fuel cycle facilities consistent with the national long term fuel cycle strategy, the power plant construction programme and the national non-proliferation commitment.	

Observations

The 2018 IGA on Construction of the NPP stipulates that Rosatom will guarantee the supply of nuclear fuel for the entire operational period. This includes fuel assemblies, absorbing rods and technical support services.

The INIR team was informed that the EPC contract includes the delivery of the first two core loads (one for each unit). The NPP design includes a fresh fuel storage facility and all necessary systems for handling and transporting the fuel. The fresh fuel storage facility will have a minimum capacity of two core loads with five percent reserve.

The INIR team was informed that a separate contract is foreseen to be concluded for the fuel supply for the entire plant operation. This contract will provide that the nuclear fuel assemblies will be fabricated with uranium supplied by Uzbekistan. Uzbekistan has no plans to develop uranium enrichment or fuel fabrication facilities.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS
None
SUGGESTIONS
None
GOOD PRACTICES
None

16. Nuclear Fuel Cycle **Condition 16.2: Back end fuel cycle strategy defined**		**Phase 2**
Summary of the condition to be demonstrated	Based on the national policy, a back end fuel cycle strategy has been defined, including plans/options for storage (on-site and off-site), possible reprocessing or arrangements for fuel take back. Actions and timescales are consistent with the planned NPP construction programme.	
Examples of how the condition may be demonstrated	(1) A document on spent fuel management strategy, including identification of facilities needed, actions, resources and timescales. (2) Evidence that basic decisions needed for Milestone 2 have been made. This includes a decision on fuel take back if considered, a decision on spent fuel storage capacity on-site and off-site and a strategy for purchasing and building these capacities. (3) Initial requirements clearly defined in the BIS.	

Observations

A draft *Strategy for the Management of Spent Nuclear Fuel, Radioactive Waste and Decommissioning of Nuclear Installations* was developed in 2019. It contains a roadmap for implementing the strategy. The draft strategy is currently under approval by the President of the Republic of Uzbekistan. This strategy will be approved before the EPC contract is signed.

The INIR team was informed that the spent nuclear fuel will be stored up to ten years in spent fuel pools at the NPP site. The EPC contract includes construction of these pools and the infrastructure for transporting the spent fuel away from the site. After initial cooling in the spent fuel pools, the spent fuel will be loaded into storage casks and kept in a dry interim storage facility next to the site, where a plot land has been identified.

The current strategy keeps open the options of spent fuel repatriation, reprocessing abroad or direct disposal in a geological disposal facility. The decision will be taken on the basis of market conditions for uranium and nuclear material in the spent fuel and on the scientific state-of-the-art knowledge in the field. The roadmap for the spent fuel strategy includes activities to train staff and to follow international practices in this area.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS
None
SUGGESTIONS
None

GOOD PRACTICES
None

17. Radioactive Waste Management **Condition 17.1: Handling the burdens of radioactive waste considered**	**Phase 2**
Summary of the condition to be demonstrated	Based on the national policy, a clear strategy for the processing, storage and disposal of radioactive waste (including spent fuel if considered as waste) has been developed. If the reprocessing of spent fuel is considered, the waste management strategy includes consideration of the transport, storage and disposal of high level waste. Requirements for processing and storage facilities to be provided by the vendor have been included in the BIS. Plans for any national facilities for radioactive waste management and waste management organizations have been defined and are consistent with the construction programme.
Examples of how the condition may be demonstrated	(1) Policy and strategy documents for the management of radioactive waste (this may include the creation of a specific national waste management organization): (a) Disposal of all waste types; (b) Consideration of regulatory and implementation infrastructures; (c) Allocation of responsibilities; (d) Technical approaches; (e) Funding schemes. (2) Consideration of the suitability of geological conditions in the country for disposal of all types of radioactive waste and/or the potential for contracting for waste disposal with other States. (3) Requirements for facilities to be provided as part of the NPP and provisions for minimizing waste volumes and toxicity included in the BIS. (4) A plan for bidding and construction of any separate waste facilities available and consistent with the power plant construction programme. (5) A plan to initiate or enhance national waste disposal programmes.

Observations

A draft strategy for the management of spent nuclear fuel, radioactive waste and decommissioning of nuclear installations has been developed and is currently under consideration by the Government. The draft strategy was developed with the support of consultants, specialists from various ministries and the Institute of Nuclear Physics of the Academy of Science. The institute has experience in the management of radioactive waste from the operation of its VVR-SM research reactor and is the current national radioactive waste management organization.

Radioactive waste management at the NPP site will be the responsibility of the operator. The EPC Contract will include the following on-site waste management facilities:

— Waste processing for solid, liquid and gaseous wastes (including liquid waste solidification);
— Low- and intermediate-level waste (LILW) storage;
— Very-low level waste disposal.

The INIR team was informed that the EPC contract will include requirements for waste minimization and for separation of the different waste streams and classes. The criteria for waste exemption and waste classification are specified in *SANPIN 0251-08 Sanitary Rules for Radioactive Waste Management*.

The INIR team was informed that the LILW storage facility will have a storage capacity sufficient for at least ten years of plant operation. After the on-site storage, the LILW will be transferred to the waste management organization responsible for its further management, including disposal. This organization is scheduled to be established in 2028. These provisions are included in the draft strategy.

A dry spent fuel storage facility with a capacity for the operational lifetime of the NPP will be constructed next to the NPP site.

The options for off-site storage and disposal including the selection of potential sites will be explored by a working group consisting of staff from Uzatom, the Academy of Science, Goskomgeologiya, the Ministry of Health and the Ministry of Emergency Situations. Uzatom also plans to expand national competence in this field by organizing training courses, internships and scientific visits to waste management facilities abroad. Some activities will be carried out in collaboration with international partners.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

17. Radioactive Waste Management **Condition 17.2: Preliminary decommissioning plan requested**	**Phase 2**
Summary of the condition to be demonstrated	A request for a preliminary decommissioning plan from the vendor has been included in the BIS. Specific national requirements have been included.
Examples of how the condition may be demonstrated	(1) A document discussing national requirements for decommissioning. (2) Requirements for a decommissioning plan included in the BIS.
Observations	

The INIR team was informed that a preliminary NPP decommissioning plan will be developed as part of the EPC contract. Consistent with the draft strategy this plan will consider three decommissioning scenarios: immediate dismantling, deferred dismantling and on-site disposal.

The INIR team was informed that a preliminary decommissioning plan needs to be updated as part of the periodic safety review (PSR) of the NPP. The PSR is required to be conducted every ten years and the updated safety analysis report including the decommissioning chapter is to be submitted to the regulatory authorities (Article 32 of 2019 Atomic Energy Law).

In planning NPP decommissioning, Uzatom is benefitting from national experience with the decommissioning of the IIN-3M research reactor and the planned decommissioning of the VVR-SM research reactor.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None

GOOD PRACTICES

None

18. Industrial Involvement **Condition 18.1: National capabilities assessed and plans to enhance capability defined**	**Phase 2**
Summary of the condition to be demonstrated	A review of national capability has been completed, identifying areas where national supply is available or can be developed. Based on this, volume targets, or specific areas, for national involvement have been developed. Plans for upgrading national capability have been defined and funded. The transfer of technology including intellectual property has been considered.
Examples of how the condition may be demonstrated	(1) A realistic assessment of the national and local supplier capabilities based on the national policy recommended by the NEPIO. (2) An assessment of the training and funding requirements to upgrade quality. (3) Extent of national industrial participation agreed, desired targets for local and national industrial involvement specified, and requirements for the transfer of technology, including intellectual property, included in the BIS. (4) Clear plans and programmes identifying: (a) Specific industrial involvement in future construction, maintenance or operational support services; (b) Audits of the progress of industrial preparation and ability to meet the requirements for addition to the approved supplier list; (c) Short term and long term programmes (including future projects) to develop the ability to produce items initially being supplied by foreign suppliers; (d) Requirements for industries to be added to the potential vendor/service supplier lists; (e) Requirements for export and import consistent with the State's commitment and obligations with regard to non-proliferation of nuclear weapons and safeguards implementation.

Observations

With regards to the participation of Uzbek entities in the project, the 2018 IGA on NPP Construction establishes obligations for the Directorate for NPP Construction related to technical specifications, documentation, quality assurance and coordination of work.

Uzatom has developed a list of applicable norms and standards including those of the Russian Federation, which the Ministry of Economy has distributed to potential Uzbek suppliers of works, goods and services. In consultation with the companies, Uzatom has identified potential areas for participation including the supply of construction materials, electrical equipment and construction labour and services.

To increase national participation in the project, Uzatom has formed joint ventures with Worley and Orgenergostroy: Uzatom Worley Engineering and UzOES. The INIR team was informed that Uzatom Worley Engineering has been assigned to review applicable Uzbek and Russian norms and standards and propose a set of harmonized standards. UzOES is responsible for laboratory testing of materials to

support the accreditation of Uzbek suppliers and ensure the compliance of Russian materials with applicable norms and standards.

Uzatom Worley Engineering and UzOES are further responsible for screening Uzbek companies and identifying those which could be pre-qualified with additional support. The current activities of Uzatom Worley Engineering and UzOES are funded through their seed capital, which will be recovered through the provision of services to companies for their preparation for accreditation and certification. Accreditation is performed by UZSTANDARD Agency.

A roadmap with actions and responsibilities covering all these activities is in place. These localization efforts are focused on developing long-term industrial partnerships.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS
None
SUGGESTIONS
None
GOOD PRACTICES
None

19. Procurement **Condition 19.1: Procurement capability available**		**Phase 2**
Summary of the condition to be demonstrated	A procurement capability has been established for specific services, such as siting work and consultancy services.	
Examples of how the condition may be demonstrated	(1) Procedures or audits to ensure suppliers have appropriate expertise and experience. (2) Evidence of preparation of formal specifications for the services required. (3) Quality standards included in the service specifications. (4) Awareness of the non-proliferation regime with regard to nuclear or nuclear related trade.	

Observations

According to the 2018 IGA on NPP Construction, contracts between Uzbek and Russian authorized organizations are concluded as a result of direct negotiations. Uzatom is authorized by a presidential decree to contract goods and services as an exception without tender.

Uzatom's Department of Financial and Economic Analysis is responsible for procurement activities and acts as secretary of a Tender Commission. The procedure for procurement is established by Uzatom's regulation No. R11140-2/001:2018, and the procedure of the Tender Commission is established by Uzatom's regulation No. R10-023:2019.

Uzatom has concluded contracts with companies for consulting services related to the EPC contract, siting and environmental impact assessment activities and the development of safety related documentation. The Department of Financial and Economic Analysis supports the Directorate for NPP Construction. It is planned that as the NPP project evolves, the Directorate will develop its own procurement department for specifying work requirements, developing tender documents, inspecting and accepting goods, addressing customs requirements and managing contracts.

Procurement at Goskomprombez is performed according to the Government's regulations. The organization is able to contract services for expert review including foreign consultants. The INIR team was informed that Goskomprombez has conducted an analysis of services needed related to the nuclear power programme in Phases 2 and 3 and that the existing structure and procedures are considered adequate to meet the needs in this area.

Areas for further action	**Significant**	No
	Minor	No

RECOMMENDATIONS

None

SUGGESTIONS

None
GOOD PRACTICES
None

APPENDIX 2: LISTS OF THE INIR TEAM MEMBERS AND COUNTERPARTS

INIR MISSION REVIEW TEAM	
Mr Milko KOVACHEV	Team Leader, IAEA
Mr John HADDAD	Mission Coordinator, IAEA
Ms Judit SILYE	IAEA
Mr Sean DUNLOP	IAEA
Mr Zia SHAH	IAEA
Ms Nadezhda KUROVA CHERNAVINA	IAEA
Ms Lisa BERTHELOT	IAEA
Mr Oleg BUKHARIN	IAEA
Mr Philippe VAN MARCKE	IAEA
Mr Sabin SABINOV	International Expert
Mr Marcelo GOMES DA SILVA	International Expert
Mr Zaid AL SHAREEF	Observer

PARTICIPANTS FROM UZBEKISTAN			
No.	**INFRASTRUCTURE ISSUE**	**REPRESENTATIVE**	**RESPONSIBLE ORGANIZATION(S)**
1	**National Position**	Adilov Abbos Hidirnazarova Aleksandra Raupov Anvar Yakubekov Sardor	Uzatom Agency Uzatom Agency Ministry of Energy Regulatory Body

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
2	**Nuclear Safety**	Mukhamedjanov Aybek Hikmatullaev Bahtiyar Kilichov Zulfiqor Abdulazizov Hakimjon Khuzhamberdieva Lola Hikmatullaev Bahtiyar Sidikov Akmal Karaev Aleksey Akhmedov Rafael Pulatov Temur Hikmatov Eler	Regulatory Body Uzatom Agency Ministry of Emergency Situations Ministry of Emergency Situations Ministry of Health Uzatom Agency State Committee on Ecology State Committee on Ecology Ministry of Defense National Guard Uzstandart Agency
3	**Management**	Farrukh Tashmetov Amanov Otabek Raupov Anvar Kilichov Zulfiqor Abdulazizov Hakimjon Zaredinov Damir Shabanov Anvar Yarullina Zulfiya Sherimbetov Khalilulla Yusupov Djalil	Uzatom Agency Uzatom Agency Ministry of Energy Ministry of Emergency Ministry of Emergency Ministry of Health State Committee on Ecology State Committee on Ecology State Committee on Ecology Regulatory Body
4	**Funding and Financing**	Teshabaeva Gulshan Sultanov Bahodir Khuzhanov Ravshan Khudaibergenov Talgat	Uzatom Agency Uzatom Agency Ministry of Finance Ministry of Finance

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
5	**Legal Framework**	Ibadullayev Timur Abdukamilov Shavkat Sagdiev Sherzod Zaredinov Damir Kilichov Zulfiqor Pulatov Temur Mukhamedov Bobur Umurzakov Aziz Hikmatov Eler Isabekov Bakhtiyar Juraev Sherali	Uzatom Agency Uzatom Agency Regulatory Body Ministry of Health Ministry of Emergency Situations National Guard State Committee on Ecology State Tax Committee Uzstandart Agency Ministry of Defense State Committee for Geology and Mineral Resources
6	**Safeguards**	Yakubekov Sardor Hikmatullaev Bahtiyar Raupov Anvar Muhamedjanov Oybek Ahmedov Rafael Boltaev Norbek Kilichov Zulfiqor Abdulazizov Hakimjon. Mukhamedov Bobur Zaredinov Damir	Regulatory Body Uzatom Agency Ministry of Energy Regulatory Body Ministry of Defence Ministry of Defence Ministry of Emergency Ministry of Emergency State Committee on Ecology Ministry of Health
7	**Regulatory Framework**	Yakubekov Sardor Hikmatullaev Bahtiyar Kilichov Zulfiqor Mukhamedjanov Aybek Zaredinov Damir Isabekov Bakhtiyar	Regulatory Body Uzatom Agency Ministry of Emergency Regulatory Body Ministry of Health Ministry of Defense

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
7	**Regulatory Framework (Cont.)**	Pulatov Temur Mukhamedov Bobur Hikmatov Eler Juraev Sherali	National Guard State Committee on Ecology Uzstandard Agency State Committee on Geology and Mineral Resources
8	**Radiation Protection**	Zaredinov Damir Hidirnazarova Aleksandra Sidikov Akmal Karaev Alexey Raupov Anvar Kilichov Zulfiqor Eshmuradov Otabek Abdumannabov Obidjon Akhmedov Rafael Juraev Sherali Romanov Viktor Mavlyanov Temur	Ministry of Health Uzatom Agency State Committee on Ecology State Committee on Ecology Ministry of Energy Ministry of Emergency Regulatory Body Uzatom Agency Ministry of Defense State Committee on Geology and Mineral Resources State Committee on Geology and Mineral Resources State Committee on Geology and Mineral Resources
9	**Electrical Grid**	Isakulov Sardor Abdurahmanov Jahangir Nazirov Abdumalik Saidov Miromil Amanov Otabek Kasimov Mukhtar Hikmatov Eler	Ministry of Energy Uzatom Agency Ministry of Energy Ministry of Energy Directorate for NPP construction Uzatom Agency Uzstandart Agency

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
10	**Human Resource Development**	Abdukamilov Shavkat Raupov Anvar Tashmetov Mannap Yakubekov Sardor Faziev Ziyodulla Sanetullaev Alisher	Uzatom Agency Ministry of Energy Academy of Sciences Regulatory Body Uzatom Agency Tashkent branch of the NRNU MEPhI
11	**Stakeholder Involvement**	Asadov Anvar Ravshanova Gulruhsor Raupov Anvar Mukhamedjanov Aybek Hidirnazarova Aleksandra Saidov Miromil Amirov Farruh	Uzatom Agency Uzatom Agency Ministry of Energy Regulatory Body Uzatom Agency Ministry of energy Khokimiyat (administration) of Jizzakh region
12	**Site and Supporting Facilities**	Abdurahmanov Jahangir Raupov Anvar Yusupov Jalil Zaredinov Damir Kilichov Zulfiqor Ortikov Furkat Atajanov Shikhnazar Yuldoshev Sohib Rakhimov Rustam Akhmetzyanov Pavel Hikmatov Eler Akhmedov Rafael Juraev Sherali	Uzatom Agency Ministry of Energy Regulatory Body Ministry of Health Ministry of Emergency Ministry of Agriculture Ministry of construction State Committee on Ecology Ministry of Water Resources Ministry of Water Resources Uzstandard Agency Ministry of Defense State Committee on Geology and Mineral Resources

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
13	**Environmental Protection**	Hidirnazarova Aleksandra Zaredinov Damir Kilichev Zulfiqor Yarullina Zulfiya Shabanov Anvar Sherimbetov Xalilulla Muratov Qurban Dilshod Sultanov Isabekov Bahtiyor Pulatov Timur Popov Vadim Yuldoshev Sokhib Ahmedov Rafael Juraev Sherali Romanov Viktor Talipov Bekhzod Isaev Abror Omonturdiev Amriddin	Uzatom Agency Ministry of Health Ministry of Emergency Committee of Ecology State Committee on EcologyState Committee on Ecology Ministry of Water Resources Ministry of Economy Ministry of Defence National Guard SUE "UzGASHKLITI" State Committee on Ecology Ministry of Defence State Committee on Geology and Mineral Resources State Committee on Geology and Mineral Resources State Committee on Geology and Mineral Resources Regulatory Body Ministry of Transport Ministry of Transport
14	**Emergency Planning**	Kilichev Zulfiqor Abdulazizov Hakimjon Raupov Anvar Talipov Bekhzod Zaredinov Damir Karaev Alexey Omonturdiev Amriddin Ahmedov Rafael Pulatov Temur	Ministry of Emergency Ministryof Emergency Ministry of Energy Regulatory Body Ministry of Health State Committee on Ecology Ministry of Transport Ministry of Defence National Guard

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
14	**Emergency Planning (Cont.)**	Kasimov Davron Hidirnazarova Aleksandra Abdumannabov Obidjon Nurmatov Abdullo Juraev Sherali	Ministry of Internal Affairs Uzatom Agency Uzatom Agency Uzatom Agency State Committee on Geology and Mineral Resources
15	**Nuclear Security**	Abdumannabov Obidjon Yusupov Djalil Raupov Anvar Yusupov Jalil Isabekov Bakhtiyar Pulatov Temur Kilichov Zulfiqor	Uzatom Agency Regulatory Body Ministry of Energy Regulatory Body Ministry of Defence National Guard Ministry of Emergency
16	**Nuclear Fuel Cycle**	Hikmatullaev Bahtiyar Raupov Anvar Yusupov Jalil Khamidov Khurshid Zaredinov Damir Kilichov Zulfiqor Allayarov Husniddin Tokhtakhunov Kasim Hikmatov Eler Nazarov Valijon	Uzatom Agency Ministry of Energy Regulatory Body Ministry of Transport Ministry of Health Ministry of Emergency State Committee on Ecology Uzatom Agency Uzstandart Agency Navoi Mining & Metallurgy Combine

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
17	**Radioactive Waste Management**	Talipov Bekhzod Ziyamuhamedov Akbar Raupov Anvar Allayarov Husniddin Tokhtakhunov Kasim Hidirnazarova Aleksandra Hikmatov Eler	Regulatory Body Academy of Sciences Ministry of Energy State Committee on Ecology Uzatom Agency Uzatom Agency Uzstandart Agency
18	**Industrial Involvement**	Tashmetov Farrukh Raupov Anvar Yusupov Jalil Zaredinov Damir Kilichov Zulfiqor Juraev Akbar Khuzhanov Ravshan Mukhidov Sherzod Yarullina Zulfiya Sadullaeva Nafisa Botirov Shavkat Khamidov Khurshid Ortikov Furkat Hikmatov Eler Kasimov Davron Pulatov Temur Juraev Sherali Smyshlyaev Oleg	Uzatom Agency Ministry of Energy Regulatory Body Ministry of Health Ministry of Emergency Situations Ministry of Employment and Labor Relations Ministry of Finance Ministry of Construction State Committee on Ecology State Tax Committee Ministry of Water Resources Ministry of Transport Ministry of Agriculture Uzstandart Agency Ministry of Internal Affairs National Guard State Committee on Geology and Mineral Resources SUE "UzGASHKLITI"

No.	INFRASTRUCTURE ISSUE	REPRESENTATIVE	RESPONSIBLE ORGANIZATION(S)
19	**Procurement**	Kadirov Sardor Sultanov Bakhodir Khuzhanov Ravshan Khudaibergenov Talgat Sadullaeva Nafisa Umurzakov Aziz Abdullaev Shukhrat Amanov Otabek	Uzatom Agency Uzatom Agency Ministry of Finance Ministry of Finance State Tax Committee State Tax Committee State Tax Committee Directorate for NPP construction

APPENDIX 3: REFERENCES

Documents provided by Uzbekistan

1. Law of the Republic of Uzbekistan No. 2018-xii About Subsoil, 23 September 1994, Tashkent (1994);
2. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, No. 102 On Measures to Ensure the Efficiency of Design and Construction Work in the Field of Nuclear Energy, 6 February 2019, Tashkent (2019);
3. Decree of the President of the Republic of Uzbekistan, No. DP-4165 On Approval of the Concept for the Development of Nuclear Energy for the Period 2019-2029, 7 February 2019, Tashkent (2019);
4. Protocol of the Joint Meeting of the Republican Working Group No. 01-06/1-2691 On the Coordination of the Implementation of the Project for the Construction of Nuclear Power Plant in the Republic of Uzbekistan and the Scientific, Technical and Expert Council of the Uzatom Agency, 4 June 2019, Tashkent (2019);
5. Agreement on the Convergence of Approaches to Regulatory and Technical Regulation, Conformity Assessment, Standardization, Accreditation, and Metrological Support in the Field of Peaceful Use of Nuclear Energy, 26 May 2017, Kazan (2017);
6. Law of the Republic of Uzbekistan No. ZRU-472 On Public Procurement, 9 April 2018, Tashkent (2018);
7. Regulation No. Uzatom P 11140-2.001: 2018, On the Organization and Conduct of Procurement of Goods, Works and Services of the Uzatom Agency, 28 January 2019, Tashkent (2019);
8. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 800 On Additional Measures for Organizing the Activities of the Agency for the Development of Nuclear Energy under the Cabinet of Ministers of the Republic of Uzbekistan, 6 October 2018, Tashkent (2018);
9. Communication Plans for the Formation of Positive Public Opinion regarding the Implementation of the NPP Construction Project signed with the State Atomic Energy Corporation ROSATOM, for the years 2018, 2019 and 2020, Tashkent (2018, 2019, 2020);
10. AGENCY FOR THE DEVELOPMENT OF NUCLAR ENERGY (UZATOM), Media Plan, 18 January 2020, Tashkent (2020);
11. Memorandum of Understanding between the State Atomic Energy Corporation ROSATOM and the Agency for the Development of Nuclear Energy (Uzatom Agency) on the Formation of Positive Public Opinion regarding Nuclear Energy Program in the Republic of Uzbekistan, 19 October 2018, Tashkent (2018);
12. Roadmap 2019-2020, No. 06/1-4469, for the Implementation of Main Activities for the Construction of Nuclear Power Plant in the Republic of Uzbekistan (approved by the Advisor to the Prime Minister of the Republic of Uzbekistan, Mr Abdulla Aripov, the Minister of Energy, Mr A.S. Sultanov and the Director General of the State Atomic Energy Corporation ROSATOM, Mr A.E. Likhachev, 20 May 2019, Tashkent (2019);

13. Contract No. UZ_CST_Contract_20180907 between JSC Atomenergoproekt and the Agency for the Development of Nuclear Energy (Uzatom Agency) for the Provision of Engineering Survey Advisory Services for the Selection of the NPP site in the Republic of Uzbekistan, 7 September 2018, Tashkent (2018);

14. JV LLC UZLITI ENGINEERING, JSC INSTITUTE ORGENERGOSTROY, Environmental Impact Assessment of the Construction and Operation of a Nuclear Power Plant (the first stage - a selection of the site for the location of the nuclear power plant), Reference No. 20/2018, 26 December 2018, Tashkent (2018);

15. Action Plan for Public Consultation and Disclosure of Information, as well as Public Involvement in the Environmental Impact Assessment of the Construction and Operation of Nuclear Power Plants in the Republic of Uzbekistan, Ref. No. 06/1-2691 approved on 3 March 2020, Tashkent (2020);

16. Portfolio of Investment Projects for the Development of Nuclear Energy in the Republic of Uzbekistan, Ref. No. 06/1-2690, 17 June 2019, Tashkent (2019);

17. Decree of the President of the Republic of Uzbekistan No. DP–4048 On Measures to Accelerate the Construction of a Nuclear Power Plant in the Republic of Uzbekistan, 4 December 2018, Tashkent (2018);

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APPENDIX 4: ABBREVIATIONS

AMMP	Almalyk Mining and Metallurgical Plant
BIS	Bid invitation specification
BOO	Build-own-operate
BOOT	Build-own-operate-transfer
BSRERS	Basic Sanitary Rules for Ensuring Radiation Safety
CC UZ	Civil Code of the Republic of Uzbekistan
CEO	Chief executive Officer
CIS	Commonwealth of Independent States
COMPASS	Comprehensive Capacity-Building Initiative for the System of Accounting for and Control of Nuclear Materials and Safeguards Implementations
CSA	Comprehensive Safeguards Agreement
DBT	Design basis threat
DIQ	Design information questionnaire
EIA	Environmental impact assessment
EIS	Environmental impact statement
EPC	Engineering, procurement, and construction
EPREV	Emergency Preparedness Review
EPZ	Emergency planning zones
GCNEP	Global Centre for Nuclear Energy Partnership
GDP	Gross domestic products
GOST	Interstate standard (state all-union standard)
GW	Gigawatt
HLW	High-level radioactive waste
HPP	Hydroelectric power plant
HRD	Human resource development

IAEA	International Atomic Energy Agency
IMS	Integrated management system
INIR	Integrated Nuclear Infrastructure Review
INSServ	International Nuclear Safety and Security Advisory Service
INSSP	Integrated Nuclear Security Support Plan
IPPAS	International Physical Protection Advisory Service
IRS	Ionizing radiation source
ISO	International Organization for Standardization
ISSAS	Safeguards advisory service missions
JAIF JICC	JAIF International Cooperation Center
JSC	Joint-stock company
LILW	Low- and intermediate-level waste
LLC	Limited liability company
MAD	Maximum allowable discharge
MEPhI	National Research Nuclear University, Moscow
MES	Ministry of Emergency Situations of the Republic of Uzbekistan
MoC	Memorandum of cooperation
MoU	Memorandum of understanding
MPE	Maximum permissible emission
MW	Megawatt
MWe	Megawatt electric
NEPIO	Nuclear Energy Programme Implementing Organization
NF	Nuclear facilities
NGO	Non-governmental organizations
NMAC	Nuclear Material Accounting and Control
NMMC	Navoi Mining and Metallurgical Combine
NPP	Nuclear power plant

NPPQAP	Nuclear power plant quality assurance program
NSR	Nuclear safety regulations
OHSAS	Occupational health and safety management systems
OZ	Observation zone
PPA	Power purchase agreement
PPP	Public-private partnership
PSCA	Preliminary safety case assessment
PUI	Peaceful Uses Initiative
RBWCNR	Research beam water-cooled nuclear reactor of pool type
RCM	Resolution of the Cabinet of Ministers
RDSRW	A Republican disposal site for radioactive waste
RSS	Radiation safety standards
RW	Radioactive waste
SCIS	State Committee on Industrial Safety of the Republic of Uzbekistan
SDP	State declaration portal
SER	Self-evaluation report
SERN	Sanitary and Epidemiological Rules and Norms
SES	State System for Prevention and Action in Emergency Situations of the Republic of Uzbekistan
SNF	Spent nuclear fuel
SPZ	Sanitary protection zone
SRA	State regulatory authority
SSAC	State System of Accounting for and Control of Nuclear Material
SUE	State unitary enterprise
TC	Technical cooperation
TPP	Thermal power plant
TOR	Terms of references
TSO	Technical support organization

USRMS	Unified State Automated Radiation Monitoring System
UZATOM	Agency for the Development of Nuclear Energy
VLLW	Very low-level waste
VVER/PWR	Water-cooled power reactor/ pressurized water reactor
WANO	World Association of Nuclear Operators
WL	Waste limit
WNU	World Nuclear University