



Questionnaire

Planning for the deployment SMR

1. Please briefly explain the current situation regarding the deployment of SMR in your country.
2. Several aspects need to be assessed before engaging in a new nuclear power programme, including:
 - (a) Power requirements: determine the amount of power needed;
 - (b) Power source ratio: Evaluate the ratio of the NPP power output compared to other power sources;
 - (c) Infrastructure readiness: Assess the national infrastructure's capability to support NPP construction, operation and decommissioning;
 - (d) Design maturity: Evaluate the maturity level of the NPP design;
 - (e) Safety Standards: Ensure compliance of the NPP design with IAEA Safety Standards;
 - (f) Human expertise: Evaluate the quantity and expertise of available human resources;
 - (g) Regulatory and educational framework: Assess the readiness of the national regulatory and educational framework.
 - (h) Environmental Impact: Assess the potential environmental impact of the NPP, including waste management, cooling water requirements, and effects on local ecosystems.
 - (i) Public Acceptance: Evaluate the level of public acceptance and support for nuclear power, including addressing concerns and providing transparent communication.
 - (j) Economic Viability: Analyse the economic viability of the NPP, including cost estimates, funding sources, and long-term financial sustainability.
 - (k) Emergency Preparedness: Ensure robust emergency preparedness and response plans are in place to handle potential accidents or incidents.
 - (l) International Cooperation: Consider opportunities for international cooperation and partnerships, including technology transfer and shared expertise.
 - (m) Legal Framework: Review the legal framework governing nuclear power, including international treaties, national laws, and regulations.
 - (n) Supply Chain: Assess the readiness and reliability of the supply chain for critical components and materials needed for NPP construction and operation.

From previous aspects, give the level of priority to be considered.

3. What role do you think the IAEA should play to support the safe deployment of SMRs?

Planning for the licensing of SMR

1. Please briefly explain the current situation regarding the preparation process for licencing of SMR in your country.
2. To what extent should your country develop its own safety regulations for SMRs, and how much can your country rely on the result of the safety evaluations conducted by other countries?
3. What role do you think the IAEA should play in the safety evaluation of SMRs?

Design safety:

1. From the list here below provided, select 3 key design features of SMRs and justify why the selected features allow SMR designs to differentiate them from large NPPs.
 - a) Modularity
 - b) Modularisation
 - c) Extensive use of passive safety systems
 - d) Small footprint
 - e) Transportable



- f) Reduced operator staff
- g) Potentially small Emergency Planning Zone
- h) Higher fuel enrichment up to 20%
- i) Different design solutions to ensure reactor shutdown
- j) Off grid operation and remote sitting location
- k) Remote operation
- l) Reduced maintenance and in-service inspections activities

2. Key safety principles considered in the safety approach for the design of NPPs are:

- Principle 5 Optimization of protection
- Principle 6 Limitation of risk to individuals
- Principle 7 Protection of present and future generations
- Principle 8 Prevention of accidents

Provide a justification on how those principles are ensured in SMR designs. You may select a particular design as an example.

3. The concept of defence in depth, complemented with the concept of practical elimination, both constitute the primarily means in the safety approach of NPP design to prevent accidents and mitigate their consequences, if they do occur. The defence in depth has five levels. Taking an SMR design as an example:
- 3.1. Provide 3 examples of design features considered at different levels of defence in depth.
 - 3.2. Provide 3 design features considered for the concept of practical elimination.

Safety Assessment:

- 1. Taking into consideration the difference in reactor technologies and in designs of SMRs, conducting the safety assessment is key to ensure confidence on their adequate and sufficient level of safety. The safety assessment process as described in Figure 1 of GSR Part 4 (Rev.1) encompasses several topics for evaluation. From the list below select 3 topics and explain their relationship:
 - a) Engineering aspects important to safety
 - b) Defence in depth
 - c) Safety margins
 - d) Deterministic safety analyses
 - e) Probabilistic safety assessments.
 - f) Safety functions
 - g) Radiation protection risk
 - h) Site characteristics
 - i) Human factors
- 2. Requirement 13 of IAEA Safety Standard, GSR Part 4 (Rev.1), requires the assessment of the adequate and sufficient implementation of design provisions at each level of the defence in depth concept in the design of the nuclear installation. One key aspect of the evaluation concerns whether the layers of protection and physical barriers are independent of one another as far as practicable. Explain why it is important to evaluate the independence of layers and barriers of protection and provide examples.
- 3. Requirement 17 of IAEA Safety Standard, GSR Part 4 (Rev.1), requires that uncertainty and sensitivity analysis to be conducted taking into consideration the results of the safety analyses and the conclusions. Explain why it is important to conduct uncertainty and sensitivity analyses, in particular for SMRs, and provide examples where uncertainty and sensitivity analyses are considered.

**Licensing process:**

1. The International Atomic Energy Agency's (IAEA) safety standards provide a framework for ensuring the safety and regulatory compliance of SMRs, taking into account their innovative features such as passive safety systems and modular construction. How do the IAEA safety standards support and streamline the licensing process for SMRs, considering their unique design and operational characteristics?
2. What are the key stages in the SMR licensing process, and how do they ensure the safety and security of the reactor?
3. How do regulatory bodies address the unique challenges posed by SMRs compared to traditional large-scale reactors?
4. What role does public engagement play in the SMR licensing process, and how is it integrated into the regulatory framework?