National regulatory infrastructure in the perspective of increased interest in SMR projects

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Introduction

- Azerbaijan has a special geographical location in terms of land and sea borders with countries having nuclear technologies, nuclear power plants and other nuclear installations.
- Today in the Republic of Azerbaijan there are no nuclear installations and waste management facilities of nuclear fuel cycle, as well as no extraction and processing of uranium ores are carried out. Radioactive sources, as well as nuclear materials available in the country are mainly used in oil and chemical industry, research institutes and medical facilities.
- At the same time, Azerbaijan's economic development is aimed at expanding all economically and technologically profitable economy fields, industry and energy, including the creation and implementation of technologies for long-term energy independence of the country, such as use of alternative energy sources, as well as the peaceful use of nuclear technologies.
Electricity Production

Distribution of Electricity Production in the Republic. (January - June 2023)

- Thermal Power Stations: 12826,1 m. kWh
- Hydroelectricity: 891,0 m. kWh
- Other sources: 190,8 m. kWh

References: https://minenergy.gov.az
Statistical data on the production, export and import of electricity (January - June 2023).

**Production of electricity:**

13 907.9 m. kWh

**Export of electricity:**

1 265.2 m. kWh

**Import of electricity:**

137.5 m. kWh

References: https://minenergy.gov.az
Oil and gas reserves

The evaluations set oil reserves of the “Azeri”, “Chirag” fields and the deep-water part of “Gunashli” field at 1,072,000,000 tons. Azerbaijan's proven gas reserves are 2.6 trillion cubic meters, and estimated reserves are about 3 trillion cubic meters. It will enable Azerbaijan to be regarded as a reliable supplier of hydrocarbon resources for the next 100 years.

Long-term energy independence and building up export potential

The solid establishment of long-term energy independence, the increase in energy potential, the environmental impact of traditional methods and climate change require consideration of alternatives for power generation. Some of the main criteria for considering such alternatives may be:

- Ease of operation;
- Safety of operation;
- High profitability;
- Performance efficiency;
- Minimizing the probability of accidents and guaranteeing the possibility of reliable mitigation of their consequences;
- Environmental acceptability;
- Fast and reliable design for commissioning and decommissioning, etc.
Small modular reactors (SMRs) as a one of proposed class of nuclear fission reactors.

Small Modular Reactors are a proposal for a new strategy to create smaller reactors that as expected can be built faster, safer and cheaper. Ideally, modular reactors would reduce the amount of on-site construction work, increase containment efficiency, and purportedly improve safety.

Based on these expectations, in Azerbaijan, as in other countries, there is a need to consider a set of issues related both to the acceptability of the possibility of design in our country, and to conduct a joint environmental impact assessment in the event of decision on construction of such reactors in neighboring countries located in close proximity to our borders.
Creation of the Regulatory Body in Azerbaijan

On 24 April 2008, the President of the Republic of Azerbaijan signed a decree on establishment of single regulatory body – State Agency on Nuclear and Radiological Activity Regulation (SANRAR) under the Ministry of Emergency Situations (MES) of the Republic of Azerbaijan. The funding of SANRAR receives from the state budget. On April 3, 2009 the President of the Republic of Azerbaijan approved the Statute of SANRAR. At the same time the organizational structure of SANRAR was approved by the Order of the Minister of Emergency Situations and in 2013 this structure has been modified. The Statute of SANRAR in significant extent reflects BSS requirements.

According to its Statute, the supervision on compliance with radiation safety and physical protection requirements at facilities and organizations involved in nuclear and radiological activities was included in the main responsibilities of SANRAR. SANRAR have rights to make decision on granting or denying permissions for radiological activities, to carry out inspections and to verify implementation of regulatory requirements, to make decisions and provide opinions on authorization of export/import activity and to carry out other regulatory functions. The requirements and recommendations of IAEA Safety Standards Series, as well as appropriate obligations under the international and bilateral agreements and conventions are followed by SANRAR and implemented to the possible extent.
Regulatory body: Organizational structure

Head of the Agency

Deputy head

Department on Nuclear and Radiological Activity control

Legal Department

Department on expert assessment of nuclear and radiation safety and education

Department on Special permissions and State registry

General department

Secret sector

Sector on Financial Accounting and technical supplies

Administrative -economic sector
SANRAR activities

- Development and improvement of the legislative framework
- State accounting and control of nuclear materials and IRS
- Authorization
- Inspection and Enforcement
- Review and assessment (Safety & Security)
- Coordination of emergency response and preparedness
- Safeguards reports and declarations
Regulatory challenges

Difficulties in the consideration and approval of projects from the point of view of organizations of regulatory control and supervision:

- lack of confirmed data on the safety of operation;
- lack of statistics of identified problems during long-term operation;
- the presence of a large number of conceptual technologies with a lack of expert assessments on the advantages and disadvantages of each of them;
- the need to revise and improve the legislative and regulatory framework;
- the need to review and improve the regulatory infrastructure, as well as the allocation of additional resources and subject-specific training for personnel aimed to the regulatory functions.
IAEA support to Member States

In recent years, the IAEA has launched extensive activities to support Member States on related issues:

- The IAEA Technical Working Group on Small and Medium Sized or Modular Reactors (TWG-SMR) was established, which is a high-level advisory group of high-level experts from Member States with interest in the development and future deployment of SMRs.

- Within the SMR Platform, the IAEA has developed the SMR Coordination and Resource Portal for Information Exchange, Outreach and Networking (SCORPION) to provide an overview of all Agency resources, service and activities on SMRs and their applications, facilitating exchange of information and experience among Member States.

- The several publications have been issued on related tasks, etc.
For the introduction of nuclear technologies for the production of electricity with the installation of Small Modular Reactors, in addition to economic, environmental and political issues, there is a need to consider a number of issues related to the regulatory infrastructure, such as:

✓ establishment of an appropriate regulatory and legislative framework;
✓ introduction of a phased licensing system, taking into account the specifics of activities and ongoing milestones;
✓ development and establishment of conditions for the validity of permits, taking into account the specifics of individual components of the activity;
✓ review and addition of inspection procedures and checklists with an emphasis on the specifics of activities related to the design, installation, operation and decommissioning of SMRs;
✓ improvement of the structure of the regulatory body with the creation, if necessary, of additional units;
Summary

✓ staffing the regulatory body with specialists who have the appropriate knowledge and have undergone the necessary skills (education, instruction, training, practical exercises, familiarization with the practical performance of duties in the countries operating SMRs);
✓ improvement of the material and technical base of the regulatory body with an emphasis on the acquisition of the necessary tools and equipment for control;
✓ initiation and development of a simplified mechanism for applying, if necessary, for technical and expert support to the IAEA and to the relevant authorities of the producers and operators countries;
✓ participation in the review and assessment of acceptability from the point of view of regulatory control of a set of issues on fuel supplies, their temporary storage, logistics criteria, waste management, as well as advance planning of all measures and the financial component for decommissioning after the end of the operational period, etc.
Thank you for your attention!

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