

Armenian NPP

There is one reactor in operation in Armenia – Armenian NPP Unit №2 with WWER 440 reactor which provides between 40 and 47% of the electricity generated in the country and is a very important component of the national economy.

The construction of the Armenian NPP was started in 1969. The Unit № 1 was commissioned in December 1976, and the Unit №2 - in January 1980. The installed capacity of each unit is 407,5 MWt, and the design lifetime is 30 years. The Armenian NPP design was developed in 1960-ies. The Armenian NPP design is based on the first generation of V-230 reactor and takes into account the seismic specifics of the plant site. The Armenian NPP consists of two WWER-440 type units, designated as version V-270. The Armenian NPP was shutdown shortly after the Spitak earthquake of 7 December 1988, with its epicenter located 80km north of the plant site. Though the plant didn't suffer any damage, and both units of the Armenian NPP remained in operation, the USSR Board of Ministers adopted decree to shutdown the plant. Thus the Unit №1 was shutdown on 25.02.1989 and the Unit №2 was shutdown on 18.03.89. Both units were in long-term shutdown condition but not decommissioned. To overcome the energy crisis on 07.04.93 the RA Government adopted decree to restart the Armenian NPP Unit №2. Before and after the Armenian NPP Unit №2 restart, several hundred safety upgrades were developed and implemented and are continuously implemented in accordance with the RA Government Decree № 474 as of 05.10.1994 on approval of the Concept for the Armenian NPP Restart, the Armenian NPP Unit №2 safety upgrading program, which is periodically revised and updated taking into account recommendations made by the expert and review missions organized in frame of the international and technical cooperation projects with the IAEA, EC, USA.

The Armenian NPP Unit № 2 is operated in accordance with the license issued by the Armenian Nuclear Regulatory Authority (ANRA) on 1 April 2011 (RA Government Decree № 400-N as of 24 March 2005 on the Approval of the Licensing Procedure and the License Form for the Operation of Nuclear Installations). The license is supported by terms and conditions to be complied with by the Armenian NPP within the specified deadlines. In accordance with the license terms and conditions, the Armenian NPP Unit № 2 shall be operated within 92% of the design thermal power rate till 5 January 2016. ANPP should also implement a “stress-test” based on WENRA technical specifications and submit the stress-test results to ANRA. The Armenian NPP is expected to submit a report on activities implemented during the scheduled outages (upgrading of safety-relevant systems, structures and components, refuelling, repairs and so on). The license terms and conditions also stipulate issues related to SAR revision, submission of periodical safety reports and other issues significant to the safe operation of ANPP Unit №2.

New NPP

The energy security, independence and economic needs of the country have led to the conclusion that nuclear power is the main option for the Republic of Armenia. Therefore, the Government decided to initiate the construction of a new nuclear power unit(s) and at the same time, undertake necessary steps to keep the ANPP operational for an extended lifetime.

The Ministry of Energy and Natural Resources of the RA elaborated an Action Program (approved under the RA Government Decree № 1296-N as of 1 November 2007) that was harmonized with the provisions of the National Security Strategy developed after the “Energy Development Strategy in the Context of Economic Development of the Republic of Armenia” and accompanying the “Least Cost Generation Plan”. In accordance with this program, it is envisaged to put new nuclear power unit(s) into operation immediately after the shutdown of the existing one to cover the lack of energy capacity with preference given to 1000 MW NPP units. In September 2008, the “Feasibility Study for the Construction in Armenia of a New Nuclear Unit” and the “Study on Environmental Impact Assessment” were developed in the frame of the USAID assistance.

In 2009, the Government of the Republic of Armenia initiated activities aimed at constructing a new nuclear unit. An international tender for the selection of a management company resulted in contracting Worley Parsons. The company has analysed the following NPP projects: AP-1000 (USA), WER-1000 (RF), and ATMEA-1 (France-Japan). Based on the comparative analysis provided in September 2009 by Worley Parsons, the Government selected the Russian NPP-92 design. As a next step, the “Law on the Construction of New NPP Unit(s) in the Republic of Armenia” was adopted on 27 October 2009, and on 20 August 2010, an intergovernmental Armenian-Russian cooperation agreement on the construction of the new NPP Unit(s) on the territory of the Republic of Armenia was signed between «Rosatom» and the Ministry for Energy and Natural Resources of the RA. The agreement specifies the terms of cooperation of two countries for the construction of new units in Armenia. Thus, the agreement provides that the Russian party will build at least one 1060 MWe AES-92 unit (with a VVER-1000 model V-392 reactor) in conformity with European Utility Requirements with a service life of 60 years at Medzamor, supply nuclear fuel and decommission the plant after its service life has expired.

The Russian-Armenian "Metsamorenergoatom" CJS, established in February 2010 specifically for NPP construction, covers 40% of the project costs, and the remaining 60% will be attracted by means of investments. After Worley Parsons will have developed “The Bankable Feasibility Study” and the tender package on the “Selection of Strategic Investors”, a tender for the selection of strategic investors to be engaged in the construction of the new NPP unit(s) in Armenia will be announced. The owner and operator of the new NPP will be “Metzamorenergoatom” CJS and “Atomstroyexport” CJS will be the principal contractor for the construction. Selection of manufacturers, design and configuration of the main equipment for the new NPP unit, as well as the company in charge of construction and erection works, will be decided on the basis of a tender and will be approved by both “Metzamorenergoatom” CJS and “Atomstroyexport” CJS.

The activities related to construction of the new unit had been suspended following the accident at the Fukushima Daiichi NPPs. However the regulations related to construction of the Armenian NPP Unit №3 are in place, in particular the following regulations have been established:

- Government Decree № 1411-N as of 08.11.2012 on approval of Design Safety Requirements to New NPP Unit(s).
- Government Decree № 1546-N as of 13.12.2012 on approval of Method on Seismic Hazard Assessment for New Nuclear Unit Site.

ANRA

The **Armenian Nuclear Regulatory Authority (ANRA)** is the state authority responsible for the regulation and control of nuclear and radiation safety. The Armenian Nuclear Regulatory Authority (ANRA) has been established under the Government of the RA № 573 as of 16 November 1993. In June 2002, ANRA was reorganized into the regulatory inspectorate for nuclear and radiation safety under the administration of the Ministry for Nature Protection of the RA. Then, under the Ordinance issued by the RA President ANRA was reorganized into the State Committee under the Government of the RA on Nuclear Safety Regulation. The ANRA has developed its organizational framework and capability in nuclear safety and radiation protection in order to perform its statutory functions in line with international practice. To complete the regulatory system in the Republic of Armenia, the Nuclear and Radiation Safety Center (NRSC) was established as a technical support organization to provide technical advice to the ANRA for safety analysis and in other areas.

The ANRA reports directly to the Government of Armenia and has been assigned the necessary jurisdiction and power to fulfill the regulatory control over nuclear and radiation safety in the nuclear energy field. The main task of the ANRA is the state regulation safety of nuclear facilities, the safe use of ionizing radiation sources, the safe management of radioactive waste, and the safe transport of radioactive and nuclear material aimed to ensure the safety of the public and of workers, to protect the environment and to defend the safety interests of the Republic of Armenia.

The ANRA's activity is governed by the Constitution of the RA, international treaties ratified by the RA, the Law of the RA on Safe Utilization of Atomic Energy for Peaceful Purposes, other laws, ANRA Statute and other legal acts.

NRSC

Nuclear and Radiation Safety Center (NRSC) is science and technology based engineering company with the main mission to provide technical support and consultancy to the Armenian Nuclear Regulatory Authority (ANRA). The NRSC was established under the of the RA Government Decree № 342 as of 25 April 2001. The NRSC uses up-to-date methods and approaches, the best available tools and verified techniques thus increasing the quality of works performed and services provided in the following areas:

- Deterministic safety analyses and assessment in thermal-hydraulic and neutronics domains;
- Probabilistic safety assessment and risk-informed decision-making;
- Regulatory review of safety analysis submittals for license applications;
- Review, revision, updating, drafting of regulations and guides;
- Development of emergency procedures and scenarios for emergency exercises
- Radiation safety and protection assessment;
- Radiometric and dosimetric measurements;
- IT support on control of ionizing radiation sources and nuclear materials (development, maintenance and update of relevant databases);
- Training of new-comers.

The NRSC uses process-oriented quality management system and got certified against ISO 9001:2008 standard since December 2010.