

USNRC's 21st Annual Regulatory Information Conference, Bethesda, Maryland,
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Upgrading Nuclear Regulatory Infrastructure in Armenia

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Outline

- ▶ Nuclear Power Program
- ▶ Nuclear Regulatory Infrastructure
- ▶ Nuclear Legislation
- ▶ Preparation to New Reactor Licensing

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Nuclear Power Program (1)

- ▶ Two VVER-440 type reactors operating in Armenia (1976, 1980).
- ▶ The plant was shutdown in 1989 following 1988 earthquake.
- ▶ Unit 2 was restarted in 1995 after "small" modernization program.
- ▶ The scheduled shutdown date is 2016.
- ▶ The Spent Fuel is stored at the spent fuel pool and NUHOMS type dry storage on-site.
- ▶ Strategic plan is to increase power capacity by 2000MW by 2020, preference is given to nuclear option.

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Nuclear Regulatory Infrastructure (1)

- ▶ Armenian Nuclear Regulatory Authority (ANRA)
- ▶ Nuclear & Radiation Safety Center (N&RSC) – TSO of ANRA

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Nuclear Regulatory Infrastructure (2)

Regulatory Authority

- ▶ ANRA was established in 1993, at that time:
 - Limited staff
 - No technical support from local institutions
 - No active cooperation with Western countries
 - Difficulties with review of safety related documents without technical support
 - Limited support from IAEA (short term missions)
 - Understanding of necessity to have local technical support.

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Nuclear Regulatory Infrastructure (3)

Regulatory Authority – new regulatory activities:

- ▶ Review of safety analysis and inspection of activities aimed at the restart of Unit 2.
- ▶ Following the restart ANRA regulated ANPP Unit 2 safety improvement activities.
- ▶ ANRA followed a set of standard documents (requirements, guidelines and procedures) developed during the Soviet time as well as Russian Federation documents.

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Nuclear Regulatory Infrastructure (4)

Regulatory Authority

- ▶ US NRC and IAEA played important role in strengthening of ANRA.
- ▶ Cooperation with US NRC was started in 1995 and included:
 - Technical Training
 - Transfer of know-how
 - Expert missions
 - Equipment supply
 - Extensive assistance to establishment of regulatory control over radiation sources.

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Nuclear Regulatory Infrastructure (5)

Nuclear & Radiation Safety Center (N&RSC) – TSO of ANRA

- ▶ Was established in 2002.
- ▶ Mission:
 - Provide technical support to ANRA.
- ▶ Capabilities:
 - Thermal hydraulic analysis
 - Core and nuclear fuel safety analyses
 - Seismic safety and structure analysis
 - PSA
 - Systems analysis
 - Radiometric measurements and radiation protection
 - IT support

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Nuclear Legislation and Regulation (1)

- ▶ The existing reactor is operated in the regulatory framework mainly developed in the Soviet Union and adopted by Armenia.
- ▶ During the past several years some national documents were developed and put into force.
- ▶ The main one is the Atomic Law (1999, amended in 2000, 2004, 2005, 2008).

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Nuclear Legislation and Regulation (2)

- ▶ Atomic Law
- ▶ Law on Licensing (2001)
- ▶ Law on Population Protection in Emergency Situations (1998)
- ▶ Special rules on transport of nuclear and radioactive materials
- ▶ Radiation safety norms and rules
- ▶ Requirements to form and contents of the Safety Analysis Report of the Armenian NPP Unit 2
- ▶ Licensing procedures for activities including nuclear materials and radiation sources.

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Preparations for Licensing (1)

- ▶ ANRA's status was changed in 2008 to independent regulatory agency under the Government:
 - Staff number was increased from 27 to 40 (additional 10 positions in 2010).
- ▶ ANRA's plan to review the existing system of regulation and to bring it into harmony with western practice in preparation for the new reactor project development.

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Preparations for Licensing (2)

- ▶ The new regulatory framework first will be needed as a basis for potential tendering process for new reactor
- ▶ US NRC and ANRA are in the process of reviewing and updating the system of regulation in framework of ANRA's strategic plan for development
- ▶ The first step of this process was development of Action Plan for such program.

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Preparations for Licensing (3)

- ▶ The Action Plan:
 - overall strategy to modify existing/develop new requirements and guidance
 - focus on existing models of regulation in countries with “small” nuclear country programs
 - based on IAEA recommendations, US NRC program and the existing legislation in Armenia
 - considers limitation of a small country program and made emphasis on risk informed approach.

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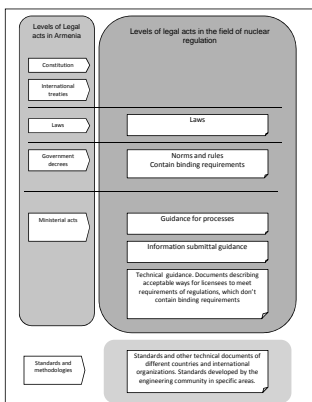
Preparations for Licensing (4)

- ▶ The Action Plan:
 - contains the hierarchy (the system) of regulatory documents, list of documents, and the schedule for their development.
 - describes general philosophy of updating the legislative framework for nuclear safety regulation in Armenia.
 - is a living document which has to be revised taking into account the plans for development of nuclear power in Armenia.

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▶ Nuclear legislation structure.



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Preparations for Licensing (6)

- ▶ Development of new documents is divided into several phases based on their priority
- ▶ First phase activities are development of the new Atomic Law and two regulatory documents:
 - Site requirements (AR-R-S)
 - Design requirements (AR-R-D)
- ▶ This will be followed by training in this area.

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Preparations for Licensing (7)

Staffing and Training Plan

- ▶ ANRA has limited number of staff with relevant knowledge and training for successful implementation of the regulatory program.
- ▶ ANRA with assistance from US NRC developed a staffing and training plan to meet its regulatory obligations.

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Preparations for Licensing (8)

- ▶ Staffing and Training Plan contains:
 - assessment and summary of regulatory body's staff needs at different stages of new reactor program.
 - the approach to personnel training, including theoretical training, OJT training and FS in other countries.
 - the role of TSO and assessment of the types and scope of required support.
 - potential role of contractors and other outside organizations
- ▶ ANRA seeks support from International organizations and foreign regulatory authorities for training of new recruited staff.

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