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Content:

Armenia's Nuclear Future: Strengthening
Safety, Innovation, and U.S. Collaboration



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Armenia's Nuclear Journey: The Story of Metsamor and Beyond

In the heart of Armenia's Ararat Valley, about 30 kilometers west of the capital, Yerevan, stands an iconic piece of history—the Metsamor Nuclear Power Plant. Built during the Soviet era, Metsamor first opened its doors in 1976, at a time when nuclear energy symbolized technological advancement and economic prosperity. For Armenia, which lacked significant natural energy resources, Metsamor was more than just an engineering achievement—it represented security, stability, and a hopeful path towards self-reliance.

At its peak, Metsamor operated two nuclear reactors, producing a substantial portion of Armenia's electricity. However, everything changed dramatically in December 1988 when a powerful earthquake devastated parts of northern Armenia. While Metsamor emerged from the earthquake unscathed, fears and safety concerns prompted a temporary shutdown in 1989. This seemingly wise choice soon plunged Armenia into darkness—literally. Without Metsamor's electricity, the young republic, recently independent from the Soviet Union, faced freezing winters, severe power outages, and economic difficulties.

Confronted with increasing public pressure and acknowledging the essential role Metsamor plays in national security, Armenian authorities made the difficult yet necessary decision to restart one reactor in 1995. This choice marked a pivotal moment, illuminating homes once more and providing the country with crucial stability. Today, Metsamor remains the backbone of Armenia's energy sector, supplying about 40% of the nation's electricity needs. For Armenians, the plant represents resilience and the determination to achieve energy independence amid challenging geopolitical realities.

Governing Armenia's Nuclear Sector: Who Ensures Safety?

While other energy sectors, along with other utilities, are regulated by the Public Services Regulatory Commission (PSRC)—the body responsible for regulating utilities, setting tariffs, and overseeing energy markets—nuclear safety regulation is notably managed separately. Given the complexity and high stakes involved, Armenia established a specialized nuclear regulator, distinct from the PSRC. This entity, known today as the Armenian Nuclear Regulatory Authority (ANRA), or formally as the State Nuclear Safety Regulatory Committee, is solely responsible for the nuclear sector.

The Committee oversees all aspects of nuclear safety, from establishing stringent safety standards and regulations to issuing and monitoring licenses. Their mission extends beyond economic or market regulation—it's about protecting people, safeguarding the environment,

and ensuring that Armenia's nuclear operations comply with international safety standards. ANRA's authority covers not only the Metsamor plant but also all nuclear and radioactive materials and activities throughout the country.

Licensing Nuclear Activities: A Carefully Monitored Realm

In Armenia, handling nuclear matters involves navigating a highly regulated environment. Almost every nuclear-related activity—such as constructing and operating reactors, storing nuclear fuel, managing radioactive waste, or even transporting materials—requires careful licensing from ANRA. Additionally, specialists in key positions within nuclear facilities must go through a stringent certification process. This ensures that only trained and qualified personnel manage tasks involving nuclear risks.

However, not all nuclear-related activities can or will ever be licensed. Armenia's legislation clearly prohibits the licensing of activities related to nuclear weaponry or the use of nuclear technology for anything other than peaceful purposes. This commitment aligns Armenia firmly with the global community, emphasizing transparency, peace, and responsible stewardship of nuclear resources. Thus, while licenses open doors to legitimate uses of nuclear energy, they also act as gatekeepers, preventing misuse or potential harm.

Armenia on the Global Stage: International Commitments and Cooperation

Since the earliest days of its independence, Armenia has actively engaged with the international community to improve its nuclear safety regime. In 1993, Armenia joined the International Atomic Energy Agency (IAEA), the global nuclear watchdog, allowing for international oversight and expertise. Around the same time, Armenia also became a party to the Nuclear Non-Proliferation Treaty (NPT), reaffirming its status as a nation committed solely to peaceful nuclear use.

Since then, Armenia has consistently expanded its global nuclear commitments. It ratified the Convention on Nuclear Safety and regularly participates in international safety peer reviews to uphold the highest standards. Armenia also signed the Joint Convention on the Safety of Spent Fuel Management and Radioactive Waste Management, demonstrating its responsibility for safely managing nuclear materials over the long term.

These international agreements are more than just symbolic—they embody Armenia's enduring commitment to transparency, safety, and responsibility. By engaging in consistent dialogue with international partners, Armenia gains from shared knowledge and resources, thereby continuously enhancing its domestic nuclear safety practices and standards.

Recent Developments: New Horizons and U.S.-Armenia Collaboration

Today, Armenia faces a critical crossroads regarding its nuclear future. Metsamor, while dependable and having undergone continuous safety upgrades, is aging. With the plant's current operational license extended at least until 2026, Armenian authorities are actively considering the next steps. Acknowledging the significance of strategic planning, Armenia has recently initiated an effort to explore options for a new nuclear power plant, potentially by the early 2030s.

Among the technologies being considered are Small Modular Reactors (SMRs)—a cutting-edge, safer, and more flexible approach to nuclear energy that is attracting global interest. Armenia recognizes an opportunity for deeper cooperation with international partners, particularly the United States, a leader in SMR technology.

Indeed, Armenia-U.S. cooperation has experienced significant growth lately. In 2022, the two countries signed a Memorandum of Understanding on Civil Nuclear Cooperation, paving the way for technological exchange, support in nuclear safety, and possibly even joint ventures in nuclear development. This collaboration also includes regulatory cooperation; Armenia's nuclear regulatory body and the U.S. Nuclear Regulatory Commission regularly exchange technical expertise and share best practices, particularly concerning seismic safety and emergency preparedness—critical areas given Armenia's seismic profile.

On January 14, 2025, Armenia and the United States signed the Charter on Strategic Partnership in a landmark event, marking a significant strengthening of bilateral relations. This comprehensive agreement covers various sectors, including defense, security, economic development, and notably, energy cooperation. The charter highlights a mutual commitment to democratic values, sovereignty, and territorial integrity, laying the groundwork for enhanced collaboration between the two nations.

A pivotal aspect of this partnership is the initiation of negotiations for a 123 Agreement, a bilateral framework that facilitates cooperation in the peaceful use of nuclear energy. Named after Section 123 of the U.S. Atomic Energy Act, these agreements are prerequisites for the transfer of nuclear technology, materials, and knowledge between the United States and other countries. For Armenia, entering into a 123 Agreement opens the door to cutting-edge nuclear technologies and expertise, which are essential for modernizing its aging nuclear infrastructure.

The negotiations seek to support the development of Armenia's civil nuclear power program while adhering to the highest standards of safety, security, and nonproliferation. This initiative is in line with Armenia's strategic goal of diversifying and securing its energy sources, thus reducing reliance on external suppliers and strengthening national energy security.

Implications for Armenia's Energy Future

The collaboration with the United States holds significant promise for Armenia's energy sector:

- **Modernizing Nuclear Infrastructure:** Access to U.S. nuclear technology can help Armenia upgrade its current facilities and possibly develop new ones, ensuring a reliable and efficient energy supply.
- **Diversification of Energy Sources:** By adopting advanced nuclear technologies, Armenia can diversify its energy mix by integrating renewable sources with reliable nuclear power, creating a resilient energy system.
- **Economic and Technical Development:** The partnership is anticipated to attract investments, enhance technical expertise, and create capacity-building opportunities, promoting economic growth and technological advancement in Armenia.

Conclusion

Armenia's nuclear energy journey is marked by resilience and strategic foresight, with Metsamor at its center, representing both past challenges and future opportunities. The evolving regulatory framework, overseen by a dedicated nuclear authority, ensures safety and international standards remain a priority. Recent collaborations, particularly the strengthened partnership with the United States in 2025, reflect Armenia's commitment to modernizing its nuclear sector responsibly and sustainably. As it moves forward, Armenia continues to balance its energy security needs with international cooperation, positioning itself to confidently and effectively navigate future challenges.

#metsamor #nuclearenergy #nuclearsafety #energylaw #nuclearregulation #renewables
#smallmodularreactors