

Analysis of Recent U.S. Nuclear Policy Changes and Their Implications

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1. Introduction

- The United States (U.S.) has increasingly focused on nuclear energy as a clean energy source to address surging electricity demand driven by domestic industrial revitalization. In 2024, the U.S. government implemented several legislative and executive measures to strengthen its nuclear industry, including the Prohibiting Russian Uranium Imports Act (H.R.1042) and the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy (ADVANCE) Act (S.870). Furthermore, Executive Orders 14154 and 14156 were issued to remove regulatory burdens and enhance energy independence. Unlike other studies, this research focuses on analyzing the latest U.S. nuclear policy changes specifically from an export control perspective, considering both regulatory shifts and their implications. The objective of this study is to assess how recent legislative and executive measures impact nuclear export regulations, influence international nuclear trade, and create challenges and opportunities for South Korea's nuclear sector.

2. Legislative and Executive Measures

2.1. ADVANCE Act (S.870)

- The ADVANCE Act is a landmark legislation that seeks to modernize nuclear licensing, promote international nuclear exports, and enhance regulatory efficiency. It reduces licensing burdens and shortens review timelines. It promotes nuclear exports to allied nations—including G7 countries and South Korea—by clarifying cooperation protocols and easing export licenses. The Act restricts U.S. entities from engaging in nuclear fuel transactions with Russian and Chinese state firms and allocates more resources to the NRC. South Korea must consider U.S. restrictions on technology transfer and re-export when engaging in projects involving U.S. nuclear components.

2.2. Prohibiting Russian Uranium Imports Act (H.R.1042)

- This legislation directly addresses U.S. energy security concerns amid geopolitical tensions with Russia. It mandates a U.S. strategic uranium reserve and supports domestic uranium enrichment through incentives. For South Korea, the act may affect nuclear fuel exports containing U.S.-origin uranium, especially in transactions with third-party countries, necessitating compliance with U.S. re-export rules.

2.3. Executive Order 14154: Unleashing American Energy

- This legislation enhances domestic uranium supply and processing through reserve stockpiling and financial incentives. While not introducing new export controls, it strengthens the U.S. nuclear supply chain and international competitiveness.

2.4. Executive Order 14156: Declaring a National Energy Emergency

- Issued in January 2025, this EO prioritizes energy independence by promoting domestic mining and enrichment of uranium and improving transportation and storage infrastructure. It also eases regulatory burdens to accelerate deployment of nuclear technologies. Though not focused on export controls, it bolsters U.S. nuclear industry capacity with possible downstream effects on global markets.

3. Regulatory Updates in Export Control

3.1. 10 CFR 810: Assistance to Foreign Atomic Energy Activities

- The Department of Energy (DOE) regulates nuclear technology exports under 10 CFR 810. In 2024, the maximum civil penalty for unintended violations increased from \$120,816 to \$124,732 per day, adjusted for inflation. The updated regulation aims to ensure stricter compliance with nuclear export control guidelines and deter unauthorized technology transfers.

4. Discussion

- The U.S. nuclear policy changes present both opportunities and challenges for South Korea's nuclear industry.
 - Enhanced Collaboration under the ADVANCE Act: The streamlining of NRC licensing procedures and export control relaxations provide South Korean entities with improved market access to the U.S. nuclear sector.
 - Opportunities from Russian Uranium Ban: With Russian uranium imports ceasing, South Korean nuclear fuel suppliers may find new business opportunities in the U.S. market.
 - Challenges in Export Control Compliance: South Korean entities using U.S. nuclear technology for international projects may face increasing regulatory hurdles due to U.S. jurisdiction over exported nuclear items. For example, the KEPCO-Westinghouse confliction case highlights potential issues in U.S. control over exported nuclear designs and technology transfers.
 - Potential Policy Shifts and Industry Impact: The Trump administration is expected to introduce strong industrial support policies and further deregulation to boost the U.S. nuclear sector.
- However, export control regulations may remain strict, particularly in China and Russia. These developments require South Korean entities to proactively strategize their market engagement.

5. Conclusion

- Over the past year, significant legislative and executive actions have reshaped U.S. nuclear policy. The ADVANCE Act facilitates nuclear technology exports and licensing efficiency, while the Prohibiting Russian Uranium Imports Act strengthens domestic energy security. Executive orders further reinforce energy independence and deregulation.
- For South Korea, these developments create new business opportunities in the U.S. nuclear sector but also introduce regulatory challenges requiring strategic adaptation. Ongoing monitoring of U.S. export control policies and proactive engagement with regulatory bodies will be crucial for South Korean entities seeking to navigate this evolving landscape.

Reference

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[6] Federal Register, "Title 10, Code of Federal Regulations (CFR) Part 810 - Civil Penalties Update," 2024.