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Significance of the Republic of Korea's Nuclear-Powered Submarine Initiative and Institutionalization Tasks: Implications for the Direction of the Special Act

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Abstract

The Ministry of National Defense's release of *The Republic of Korea's Nuclear-Powered Submarine Initiative* is significant in that it has elevated the nuclear-powered submarine debate to the level of official state policy. The Korean government has framed the nuclear-powered submarine as a national strategic project that spans national security, strategic technology, industrial capacity, international cooperation, and regional policy. Its basic direction includes low-enriched uranium-based fuel, domestic development and construction, adherence to international nonproliferation principles, nuclear safety and security, and industrial development at the national level. By setting the goal of launching the first submarine in the mid-2030s, the government has made clear that the project has entered the implementation phase.

Discussion of the special act should therefore focus on translating this policy direction into a legal and institutional framework capable of practical implementation. The special act should be designed as a comprehensive statute that integrates the implementation system, safety regulation, allocation of authority, financial support, nuclear fuel management, and community acceptance. It should establish a standing whole-of-government implementation system, an independent safety regulatory framework specialized for military reactors, principles for low-enriched uranium-based fuel procurement and spent fuel management, civilian-military role allocation, and a dual framework for security and information disclosure.

To ensure the project's sustainability as a national strategic undertaking, the act should also provide for long-term financial investment, industrial ecosystem development, specialized personnel training, base infrastructure construction, and community acceptance. Accordingly, it should incorporate a special account or long-term financial management system, project management exceptions and good-faith performance immunity for participating firms, supply-chain development and strategic component localization, a specialized personnel training system, local support and safety monitoring, and a phased roadmap. In sum, the special act should consolidate policy principles, organizational arrangements, safety and security, finance and industry, and community acceptance and infrastructure into a single implementation

framework, thereby establishing the nuclear-powered submarine program as a national project that strengthens deterrence against the North Korean nuclear threat while also fostering advanced strategic industries.

Keywords

nuclear-powered submarine, Jangbogo-N Project, special act, whole-of-government implementation system, low-enriched uranium, civilian-government role allocation, good-faith performance immunity, community acceptance

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Significance and Implications

The Republic of Korea's Nuclear-Powered Submarine Initiative, released by the Ministry of National Defense on May 26, is noteworthy because it is the first official policy document to move the nuclear-powered submarine issue beyond debates over necessity and justification. The initiative defines the nuclear-powered submarine not as a mere shipbuilding project but as a national strategic undertaking that combines national security, strategic technology, industrial capacity, international cooperation, and regional policy. It also publicly presents, for the first time at the government level, the project's implementation direction and basic principles. By naming it the Jangbogo-N Project and setting the launch of the first submarine in the mid-2030s as its goal, the government has signaled that the project has entered a full implementation phase.

The initiative carries several clear policy implications. First, by endorsing a submarine concept based on low-enriched uranium and long-cycle operation, it establishes a direction that addresses both operational endurance and international nonproliferation obligations. In addition, its emphasis on domestic development and construction reflects the goal of securing self-reliance and stability in acquisition, construction, sustainment, and maintenance. The initiative also highlights the active use of domestic nuclear power and shipbuilding capabilities, indicating that the project is

not limited to military buildup but is intended to generate civilian–military technological convergence and broader industrial spillovers. Furthermore, it outlines total life–cycle management covering design, construction, operation, maintenance, and decommissioning, while reaffirming ROK’s non–possession of nuclear weapons, compliance with international nonproliferation obligations, and safeguards cooperation with the International Atomic Energy Agency (IAEA). In this respect, the initiative articulates a policy direction that seeks to reconcile security necessity with international legitimacy.

The next task is to give concrete institutional form to this state policy through effective laws and institutions. Since the Ministry of National Defense has already established the policy direction, discussion of the special act should now focus on institutional support and implementation design. The central issues include the structure of a whole–of–government implementation system, an independent safety regulatory framework specialized for military reactors, legal principles for low–enriched uranium–based fuel procurement and spent fuel management, total life–cycle infrastructure planning, and support systems for community acceptance and industrial ecosystem development. For the project to take root as a national strategic undertaking, policy direction, special legislation, implementation plans, and organizational design must be aligned within a single coherent framework. On this basis, this brief identifies the major institutional tasks raised at the recent symposium of the Civilian–Government Joint Support Group for Nuclear–Powered Submarine Development, hosted by the Institute for National Security Strategy.

Legislative Design

The nuclear–powered submarine project cannot be adequately addressed through individual statutes such as the Defense Acquisition Program Act, the Nuclear Safety Act, or the Act on Contracts to Which the State Is a Party. A nuclear–powered submarine is both a military weapons system and a strategic asset equipped with a nuclear propulsion system. The special act

should therefore not function as a single isolated statute attempting to absorb every issue. Rather, it should take the form of package legislation, with the special act serving as the parent statute and related special provisions and amendments to existing legislation arranged under it. This structure is the most practical, as it allows distinct issues such as military secrecy, export controls, contract exceptions, community support, nuclear fuel management, and safety regulation to be addressed according to their specific characteristics. For that reason, the project requires an independent legislative framework distinct from ordinary defense projects and civilian nuclear programs.

Australia's approach to nuclear-powered submarines offers a useful reference. Rather than incorporating the project into its existing civilian nuclear framework (the ARPANS Act, 1998), Australia enacted separate legislation (the Australian Naval Nuclear Power Safety Bill, 2023) suited to the distinctive nature of military nuclear propulsion. The law establishes a nuclear safety regulator, a licensing system, obligations, enforcement powers, and penalty provisions. Its structure includes general provisions, nuclear safety duties, naval nuclear safety licenses, compliance and enforcement, the regulator, and the relationship with federal law.

The Australian case suggests that a nuclear-powered submarine special act should not remain merely a declaratory support law or a collection of special exceptions. It should instead be drafted as a comprehensive implementation statute that organically integrates project execution, safety regulation, authority distribution, and the implementation system within a single legal framework. Its scope of application should also encompass the full cycle: construction, maintenance, operation, berthing, repair, fuel storage and transfer, and disposal.

The implementation system itself cannot be left to a temporary task force or an ad hoc consultative body within the Ministry of National Defense. A policy-coordination body directly under the President should oversee national strategic direction and external negotiation posture. In parallel, a standing whole-of-government

executive organization under the Prime Minister or the Office for Government Policy Coordination should handle interagency coordination, scheduling, budget control, and the streamlining of licensing and permits. This body should function as a dedicated project group involving the Ministry of National Defense, the Defense Acquisition Program Administration, relevant ministries, research institutes, and industry. It must have substantive and independent authority, not merely consultative capacity. If the project proceeds without a single implementation system spanning design, construction, preparation for operation, maintenance, and disposal, it will inevitably face administrative fragmentation. The special act should therefore anchor a standing whole-of-government organization and the principle of clear assignment of responsibility to prevent policy confusion and the dispersion of authority across ministries.

Since the project is not a short-term policy task subject to electoral cycles, the law must also contain mechanisms that secure continuity. It should codify the legal status of the standing organization, the guaranteed term of its head, regular reporting to the National Assembly, and reporting or deliberation procedures for major policy changes. Such provisions would reduce the risks of suspension or retrenchment under changing political conditions. The purpose of the special act should not be limited to creating a new organization; it should secure continuity and consistency for a national strategic project.

The special act should also clearly define exceptions and special provisions when existing laws are applied. In matters requiring military secrecy, ordinary public-hearing procedures or uniform disclosure rules cannot simply be applied without modification. Rather than eliminating disclosure altogether, the law should institutionalize closed-door deliberation procedures, limited reporting, and differentiated disclosure according to security classification, thereby balancing secrecy protection and democratic oversight.

Nuclear Fuel Management and Role Allocation

Nuclear fuel management is a central bottleneck and should be regulated in a separate chapter of the special act rather than treated as an ancillary matter. In the initial stage, the project should rely on a stable supply system based on external procurement. Over the medium and long term, diversification of supply sources and alternative procurement options should be examined in phases. A system should be established to manage, under national responsibility, the full process of fuel procurement, loading, replacement, storage, and disposal. If necessary, a separate nuclear fuel management law may be enacted to support this framework.

A clear distinction between military and civilian roles is also required. Since a nuclear-powered submarine is fundamentally a military platform, the regulatory and operational logic of civilian nuclear power plants cannot simply be applied. At the same time, civilian capabilities remain essential to building the foundation for fuel procurement, technology accumulation, research and development, and industrial preparation. In the early stage, civilian-led activities such as fuel-related foundational research, industrial base development, and supply-chain construction should be actively utilized. After a certain stage, however, the focus should shift decisively toward military operation, security, and military management. The law and the basic plan must specify the point and scope at which control transfers to the military's exclusive domain. If legislation precedes the establishment of policy principles, confusion over boundaries and responsibilities is likely to deepen rather than diminish.

International cooperation should follow the same logic. Negotiations with the United States, consultations with the IAEA, and protection of military technology should be led by the government. Industrial cooperation, foundational technology acquisition, and supply-chain development are better led by the civilian sector and research institutions. International cooperation and fuel management should therefore be institutionalized in phases, after policy principles and civilian-military role allocation

have been established. In this project, unclear role division will blur responsibility and reduce efficiency. Roles and authority should therefore be clearly defined with the military responsible for military requirements, operations after reactor fuel loading, security, harbor control, operational employment, and the military maintenance system.

The civilian sector and research institutions should primarily handle fuel-related foundational technologies, shipbuilding and component production, supply-chain development, testing and research, personnel training, and industrial ecosystem development. In the early stage of the project, civilian-led preparation and technology accumulation will inevitably account for a relatively large share, but after a certain stage, the core operation and management systems need to shift clearly toward a military-centered structure. Civil-military role allocation is not simply a matter of cooperation: it is a matter of institutionally fixing the boundaries of responsibility and authority, and this should be clearly reflected in the special act.

Safety and Security

Safety and security should be structured as a dual system that reflects military distinctiveness while preserving independent verification. The safety of a nuclear-powered submarine cannot be treated as an extension of civilian nuclear power plant regulation. Its operating environment—submerged operations, rapid maneuvering, shock, enclosed spaces, and sustained operations—is fundamentally different from that of civilian reactors. Safety standards should therefore be developed as a separate regulatory system tailored to military maritime reactors. Existing civilian nuclear regulations have limited applicability in this context. In particular, considering military secrecy and the actual operational environment, military and civilian nuclear systems need legally distinct regulatory structures.

At the same time, safety oversight cannot be left solely to the military's internal judgment. The project implementation body and the safety supervision body should be institutionally separated.

While design, construction, and operation may be handled by the Ministry of National Defense, the Navy, and the Defense Acquisition Program Administration, approval of safety standards, periodic inspections, safety assessments, and independent audits should be assigned to a separate regulatory authority. This authority should be a standing organization with independent power, established either as a separate whole-of-government body or as a dedicated military nuclear safety regulator. The core of the safety system lies in combining military distinctiveness with independent external oversight.

Core infrastructure directly connected to the submarine's operational life cycle, such as land-based test facilities, construction bases, nuclear fuel storage facilities, home ports, maintenance and repair facilities, and disposal-related facilities, should be designated and managed as core national security facilities. Reactor design, noise-reduction technology, maintenance data, operational information, and fuel-handling data should be protected as core national technologies or top-level security information. Construction and operation facilities should also be required by law to establish an integrated security system encompassing anti-drone defense, satellite surveillance response, cybersecurity, access control, personnel background checks, and periodic security review. Since the project combines military and industrial security, its protective measures should be integrated rather than piecemeal.

At the same time, excessive secrecy on the grounds of safety and security would be undesirable. The policy direction and implementation principles should be publicly disclosed, while detailed plans and information related to core facilities should remain confidential in light of national security and strategic necessity. Information on the location, function, and timing of land-based test facilities, construction bases, home ports, and maintenance and disposal facilities should be subject to restricted disclosure. A clear distinction between disclosure and non-disclosure would help reduce unnecessary distrust while controlling security risks.

Building a Sustainable Foundation

The nuclear-powered submarine project is a long-term national strategic undertaking that cannot be pursued effectively through a single-year general-account approach. Its life-cycle costs include not only vessel construction but also reactor systems, nuclear fuel procurement, maintenance facilities, security infrastructure, education and training, spent fuel management, and decommissioning. The special act should therefore establish a special account or an equivalent long-term financial management system to secure stable funding. This mechanism should cover construction as well as operations, maintenance, repair, overhaul (MRO), decommissioning, and waste management, and it should insulate the project from short-term fiscal fluctuations.

Special project management provisions are also necessary. Given the project's high technical uncertainty and development risk, the law should permit design changes, phased contracts, demonstration-based development, risk-sharing contracts, and multi-year contracts. In addition, given the trial-and-error that may inevitably arise in the early development process, a good-faith performance immunity system should also be available within a limited scope where there is no intent or gross negligence. Without such protection, firms may avoid participation due to excessive liability exposure, which would undermine technological development. At the same time, immunity must not extend to unlawful conduct such as safety violations, security leaks, false data submission, or concealment of defects. Development failures should be distinguished clearly from acts subject to legal liability.

The special act should also support the project as an industrial policy initiative. Nuclear-powered submarines are not merely warships; they are strategic industrial platforms that combine shipbuilding, nuclear technology, materials, electronics, control systems, and MRO. Since only a limited number of vessels will be built, a model centered solely on large shipyards would make it difficult to form a sustainable industrial ecosystem. A supply-chain structure involving SMEs, component manufacturers, research

institutes, universities, and testing and certification bodies is therefore necessary. Domestic-first procurement, strategic component localization, technology protection for partner firms, and expansion of testing and certification infrastructure should be supported through legal mechanisms.

Personnel training should likewise be incorporated as a core element of the special act. Nuclear-powered submarines require comprehensive capabilities in reactor operation, radiation management, maintenance, safety review, security management, and underwater operations. The special act should therefore provide for specialized personnel training, a crew nuclear-certification system, maintenance personnel qualifications, and special protection and career management for strategic technology personnel. Recruitment and retention should be supported through security allowances, special duty allowances, long-service incentives, and post-retirement career linkage measures. Since such personnel cannot be trained in a short period, institutional arrangements for long-term accumulation of expertise must be established from the outset.

Base Infrastructure, Community Acceptance, and a Phased Roadmap

Community acceptance is essential to the stable implementation of the project, and this should be institutionalized from the pre-launch stage. The special act should include a siting policy that differentiates construction bases, home ports, and maintenance bases, together with criteria that account for military security, radiation safety, marine environmental impact, operational efficiency, and future expansion potential. The base issue is therefore not merely a question of land acquisition; it is a national policy matter that links safety, security, operations, and local support.

Facilities that directly affect local communities, such as construction bases, home ports, and maintenance or disposal-related facilities, require clear allocation of responsibility among the state, the military, and the operating agency. Such clarity is essential to establishing basic trust. The special act should therefore provide for

a regional development fund, local hiring priorities, tax support, expansion of living infrastructure, environmental and radiation safety monitoring, a resident oversight committee, and resident deliberation procedures. Community acceptance cannot be secured through explanation or one-off publicity alone; it requires substantive safety guarantees, local economic support, and continuous information-sharing and communication. Where necessary, support for surrounding areas may be regulated through a separate act or an independent chapter within the special act. Only when such an institutional foundation is in place can both the implementation of the national strategic project and community acceptance be secured together.

The roadmap should also be converted from a policy statement into a phased implementation plan directly linked to execution. Since the ROK government has set the launch of the first submarine in the mid-2030s as its target, land-based test facilities, construction bases, home ports, MRO facilities, fuel storage facilities, disposal facilities, and specialized personnel training systems should all be treated as prerequisite tasks requiring early and integrated preparation. Infrastructure construction, personnel training, industrial base development, and safety systems are not separate projects; they should be organically linked within a single national plan that supports the launch schedule and subsequent force-generation process. The roadmap should also specify preparatory tasks, implementing bodies, institutional arrangements, financial investment, and infrastructure acquisition schedules at each phase. Disclosure of the roadmap should be differentiated in light of national security and strategic necessity: the public version should present the basic policy framework, while specific locations, construction timing, as well as deployment and operational plans, should remain non-public.

The special act should go beyond providing a legal basis for implementation. It should connect policy principles, the basic plan, organizational structure, infrastructure, industrial ecosystem development, and community acceptance into a single integrated implementation framework. Only then can the nuclear-powered submarine project move beyond a one-time policy agenda and

become a durable national project that strengthens maritime deterrence and advanced strategic industrial capacity.

The project is a complex national strategic undertaking that cannot be implemented by government effort alone. Given the interdependence of nuclear power, shipbuilding, safety regulation, international cooperation, industrial ecosystems, and community acceptance, a sustained support system based on civilian–government cooperation must operate in parallel across policy, industry, research, and academia. The Civilian–Government Joint Support Group for Nuclear–Powered Submarine Development led by the Institute for National Security Strategy should serve as a long–term cooperative platform that continuously provides policy support.

The views and opinions expressed in this report are those of the author(s) and do not necessarily reflect the official position of INSS.