“New” Naval Nuclear Programs: Brazil, South Korea, Iran

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Mitigating Security and Proliferation Risks from Naval Nuclear Fuel
Brazil’s nuclear submarine program: motivations

**Strategic (official narrative):**
- Protection of the coast
- Protection of natural resources in offshore waters
- Protection against potential enemies

**Bureaucratic:**
- Navy’s organizational interests
  - steady source of funding
  - an interesting technological project

**Technology, Modernity, and Prestige:**
- Membership in the exclusive club
- Enrichment/submarine technology
Brazil’s nuclear submarine program: timeline

1970s – launch of the program

2003 – new impetus for the program under president Lula

2008 – agreement with France

2015 – Lavo Jato (Operation Car Wash) corruption scandal (main construction company Odebrecht implicated)

2017 – revelations of a corruption investigation of Brazil-France agreement

Itaguaí Naval Complex
Brazil’s nuclear submarine program: current status

- Full steam ahead but potential technical problems with the reactor
- Deliberate policy of transparency
- Unlike civilian nuclear sector, no human capital problem
- Naval fuel: below 20% enrichment
- Self-sufficient in terms of naval fuel
- Conversation about safeguards
- Projected date of completion – 2029-2030 (likely delays)
South Korea’s potential nuclear submarine program

2003 – secret “362 Initiative” (basic design for an indigenous nuclear submarine); shut down in 2004

2017 –

• Presidential candidate Moon: “The time has come when we need them.”
• President Moon appointed Song Young-moo, a retired Navy admiral who participated in “362,” as his defense minister
• July 2017 - after DPRK’s ICBM test “ready to consider”
• November 2017 – during a US-ROK summit a conversation on state-of-the art strategic assets (U.S. nuclear submarines)
South Korea’s potential nuclear submarine program: current status

October 2017 – ROK Navy commissioned a feasibility study from Korea Defense Network (KDN)

March 2018 – KDN reported back to the Navy (suggestion: a nuclear attack submarine, French Barracuda design, LEU fuel)

No decision from the Navy yet
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<td><strong>Security incentives:</strong> immediate threat (DPRK)</td>
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<td><strong>Age of the program:</strong> since 1970s</td>
<td><strong>Age of the program:</strong> since 2003</td>
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<td><strong>Nuclear reactor technology:</strong> depends on foreign partners</td>
<td><strong>Nuclear reactor technology:</strong> major producer and exporter</td>
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<td><strong>Main foreign partner:</strong> France</td>
<td><strong>Main (projected) foreign partner:</strong> France</td>
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| **Naval fuel:**  
  • Likely enrichment level – below 20% | **Naval fuel:**  
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Iran’s potential nuclear submarine program

2012–2013
- talk of nuclear propulsion

2016
- Iran’s president order the nuclear agency to draw up a plan for a nuclear submarine and naval fuel production

2018
- Iran informed the IAEA its intention to “construct naval nuclear propulsion in the future”