

# Advanced Reactor Safeguards and Security: Next Steps

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# Overview

- Following the release of the 2019 GNI report, PGS and BTI convened a workshop that assessed traditional and creative approaches to advanced reactor safeguards and security.
- An outgrowth of that discussion was a decision to draft a White Paper that seeks to evaluate the characteristics of the reactors that may: (a) mitigate nuclear weapons proliferation and security dangers; or (b) create new challenges in these areas.
- This assessment will use the GNI document and other relevant publications as a foundation to evaluate small modular and advanced reactor characteristics.



# Evaluation Criteria (1)

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- The analysis will assess the reactor characteristics on a continuum from best to most concerning, perhaps using three categories:

<b>Ideal, Best Case, Better than LWRs</b>	<b>In-Between, Up for Debate, Same as current LWRs</b>	<b>Concerning, Worst Case, Worse than LWRs</b>
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- The initial categories are:

<b>Physical Security</b>	<b>Safeguards and Nonproliferation</b>	<b>Geopolitics and Deployment</b>
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# Evaluation Criteria (2)

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- The **assessment** will be focused on 4 reactor technology classes:

Small Modular Light Water

High-Temperature Gas Cooled

Molten Salt

Liquid Metal Fast

- The **focus** will be on the 9 reactors that currently are in pre-licensing in the U.S. and Canada.
- The **objective** is to get a more accurate understanding of:
  1. Whether there are **inherent characteristics** in one or more of the reactor types or reactor designs that: (a) **support proliferation prevention and security** without requiring additional actions or guidance; or (b) that may reduce the requirements under current guidelines.
  2. **What additional actions may be required** to assure the effective safeguarding and security of the reactor types or designs that indicate the need for additional actions or guidance.
  3. **Which reactor(s)** offer the best deployment potential from a safeguards and security perspective.
- Because of the potential of this analysis to displease one or more advanced reactor design companies, it is planned **not to complete this work under the GNI project** and thereby insulate NEI from potential criticism of member organizations.