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Supporting the Development of a Regulatory Framework for Advanced Non-Light Water Reactors

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Advanced Non-Light Water Reactors Overview

There has been increasing interest in advanced non-light water reactors as a means to provide clean energy.

That interest has been apparent in:

- **Administration initiatives and Congressional appropriations**
- **Nuclear industry-led activities** (NEI, NIC, Third Way)
- **Nuclear reactor vendor concept development**
- **DOE initiatives that will be highlighted in a *Vision and Strategy for the Development and Deployment Advanced Reactors***

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Advanced Non-Light Water Reactors DOE Initiatives

- **The Test/Demonstration Reactor Planning Study has been completed, and the report is in review**
- **The DOE *Vision and Strategy for the Development and Deployment Advanced Reactors* is also in review**
- **Two awards have been made for cost-shared further development of two performance based advanced reactor concepts**
  - X-Energy (Pebble Bed High Temperature Gas Reactor)
  - Southern Company Services (Molten Chloride Fast Reactor).
- **The Gateway for Accelerated Innovation in Nuclear (GAIN) initiative to enhance nuclear infrastructure capabilities and to vastly improve private sector access to those facilities has been launched.**
  - Includes a small business voucher program

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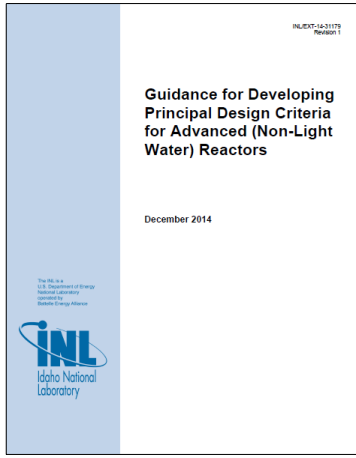
Supporting NRC Development of a Regulatory Framework

- **DOE and NRC have noted the need for regulatory guidance for non-light water reactor designs**
  - Existing licensing guidance is written for light water reactors
  - A regulatory framework is needed to support reasonable timelines for design certification and licensing
- **DOE-NE and NRC initiated a joint project for development of General Design Criteria (GDC) for non-light water reactor concepts**
  - DOE issued draft GDC in December 2014 with stakeholder input
- **Purpose of this GDC initiative is to establish guidance for advanced reactor developers. The initiative is expected to:**
  - Reduce regulatory uncertainty for advanced reactor developers
  - Improve the timeliness and efficiency of future licensing activities for both applicants and NRC staff



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Design Criteria Applicability

- **The Advanced Reactor Design Criteria (ARDC) are intended to be applicable to:**
  - Sodium Fast Reactors (SFRs)
  - Modular High Temperature Gas-Cooled Reactors (mHTGRs)
  - Fluoride High Temperature Reactors (FHRs)
  - Molten Salt Reactors (MSRs)
  - Gas Cooled Fast Reactors (GFRs)
  - Lead Fast Reactors (LFRs)
- **Two workshops had been held and stakeholder companies and organizations submitted comments and inputs on the design criteria proposed by DOE in 2014.**

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Coordinating with the NRC to Reduce Regulatory Risk

- **DOE and NRC initiated a series of workshops with industry, national laboratories, and other non-government organizations**
  - The purpose of the workshop series is to explore options for increased efficiency, from both a technical and regulatory perspective, in the safe development and deployment of innovative reactors
  - First workshop was held Sept. 1-2, 2015.
  - Next workshop scheduled June 7-8, 2016 with a focus on near term initiatives and licensing of concepts with new fuel
- **The development of Advanced Reactor Design Criteria is seen as a needed first step in the development of a regulatory framework for advanced reactors. Further actions will be explored and discussed at the next workshop.**

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