

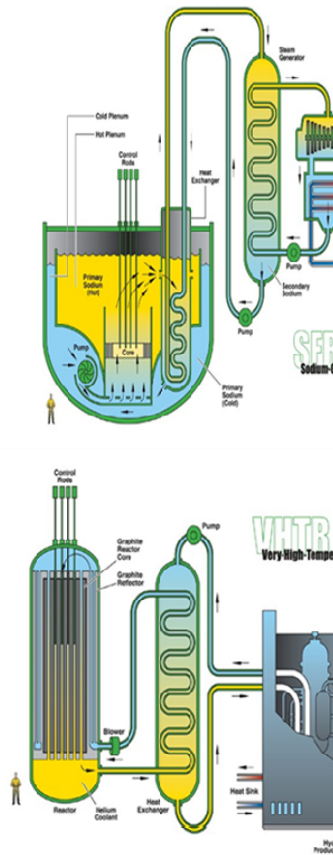
---

# NRC's Vision and Strategy for Non-Light Water Reactors

Joe Williams

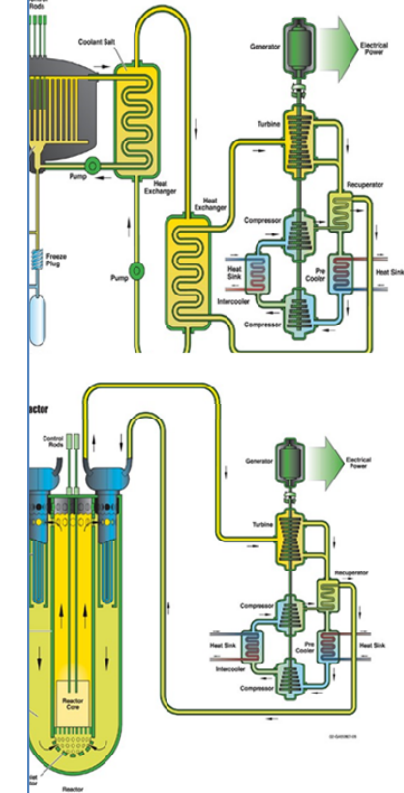
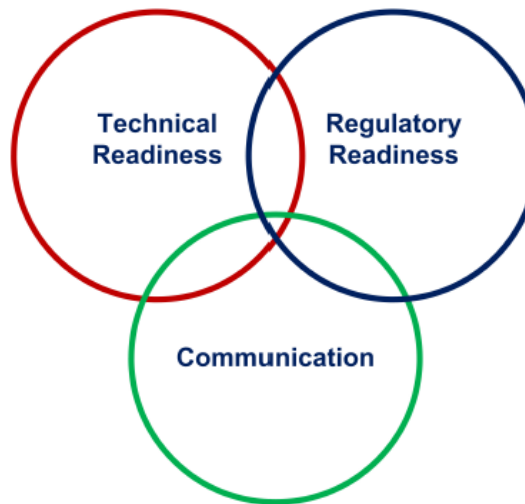
Senior Project Manager  
Office of New Reactors

# Vision and Strategy



ML16356A670

NRC Vision and Strategy:  
Safely Achieving Effective and Efficient  
Non-Light Water Reactor  
Mission Readiness



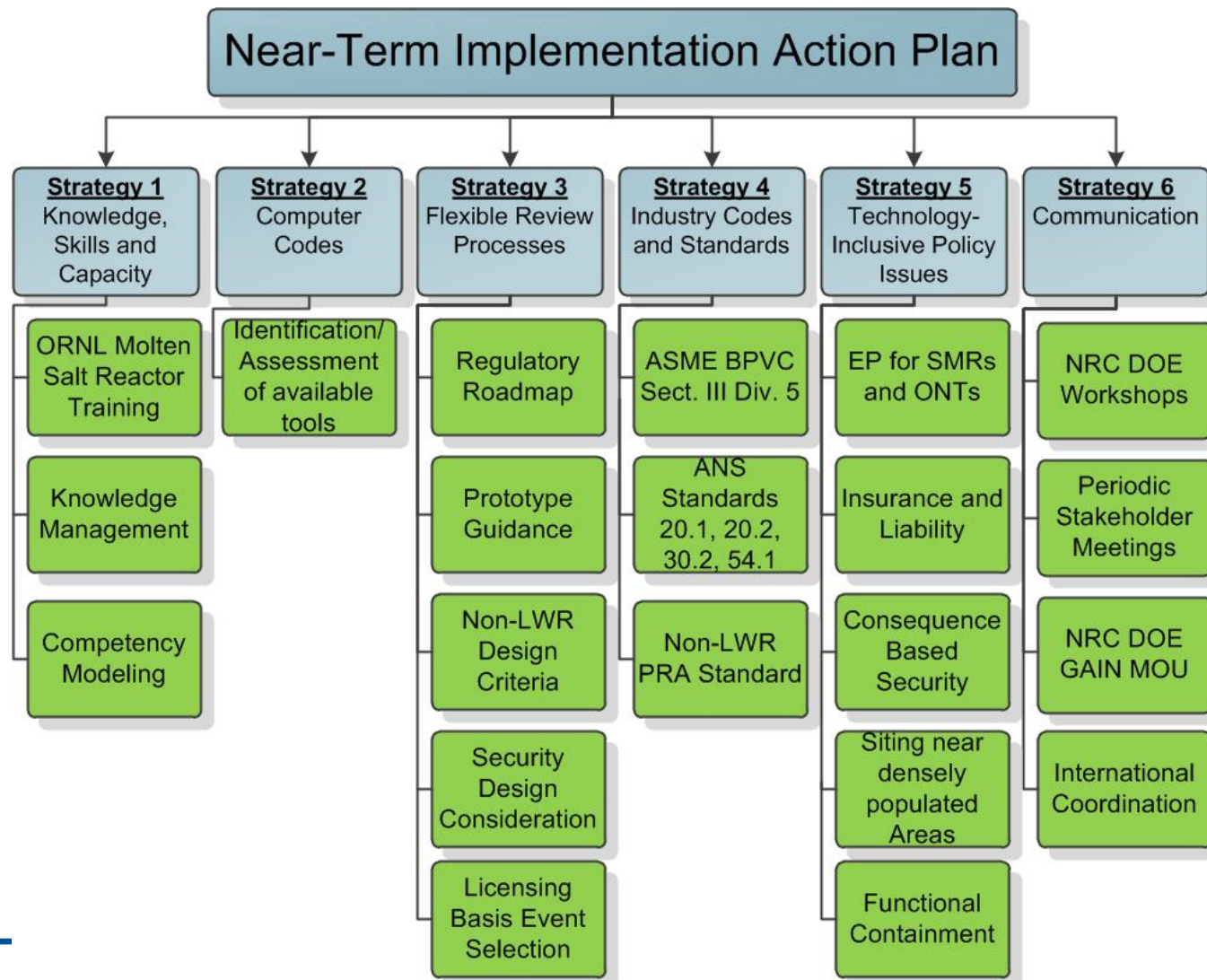
December 2016

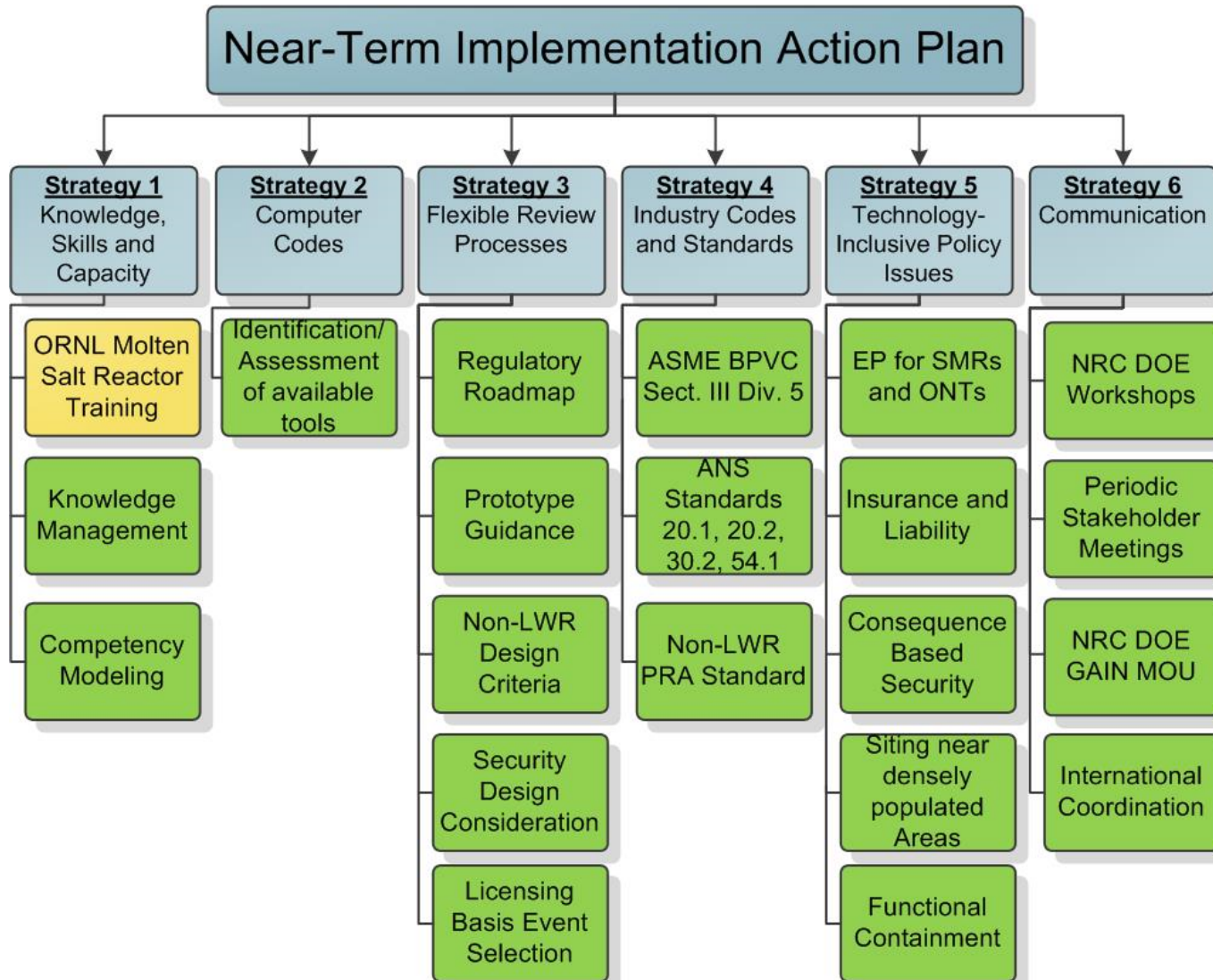
---

# Implementation Action Plans

- The IAPs are planning tools that describe:
  - Work to be done to achieve non-LWR readiness
  - Resources needed to accomplish the work
  - How to prepare the workforce to do the work
- Timeframes
  - Near-term (0-5 years)
  - Mid-term (5-10 years)
  - Long-term (>10 years)

# Executing the Vision





---

# Overview of MSR Technology Training

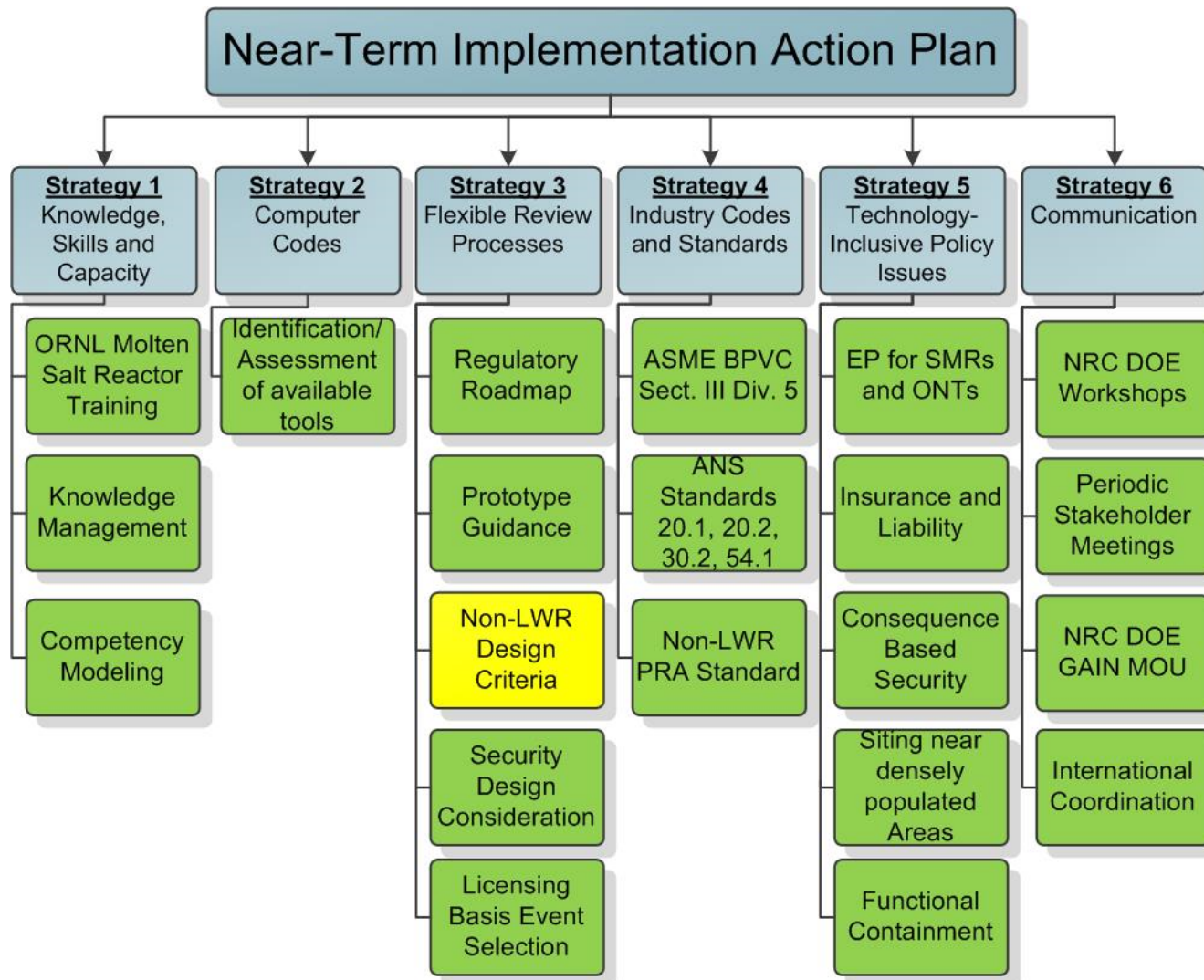
- Training prepared and delivered by ORNL staff
- Three 2-day sessions
- Approximately 90 NRC staff attending
  - NRO, NRR, RES, NMSS, NSIR, OGC
  - DOE
- First session video recorded

---

# Overview of MSR Technology Training

- History, background, current developments
- Technology and concepts
- Salt chemistry and thermal hydraulics
- Neutronics
- Materials
- Fuel cycle and safeguards
- Systems and components
- Instrumentation
- Operating experience
- Safety analysis and design requirements
- Regulatory issues and challenges
- Development and R&D issues







---

# Non-LWR Design Criteria

- NRC and DOE have been working on the initiative to develop design criteria for non-LWRs since 2013.
- DOE issued a report in December 2014 titled, “Guidance for Developing Principal Design Criteria for Advanced (Non-Light Water) Reactors.”
- NRC staff issued DG-1330 “Guidance for Developing Principal Design Criteria for Non-Light Water Reactors,” for public comment February 3, 2017.

---

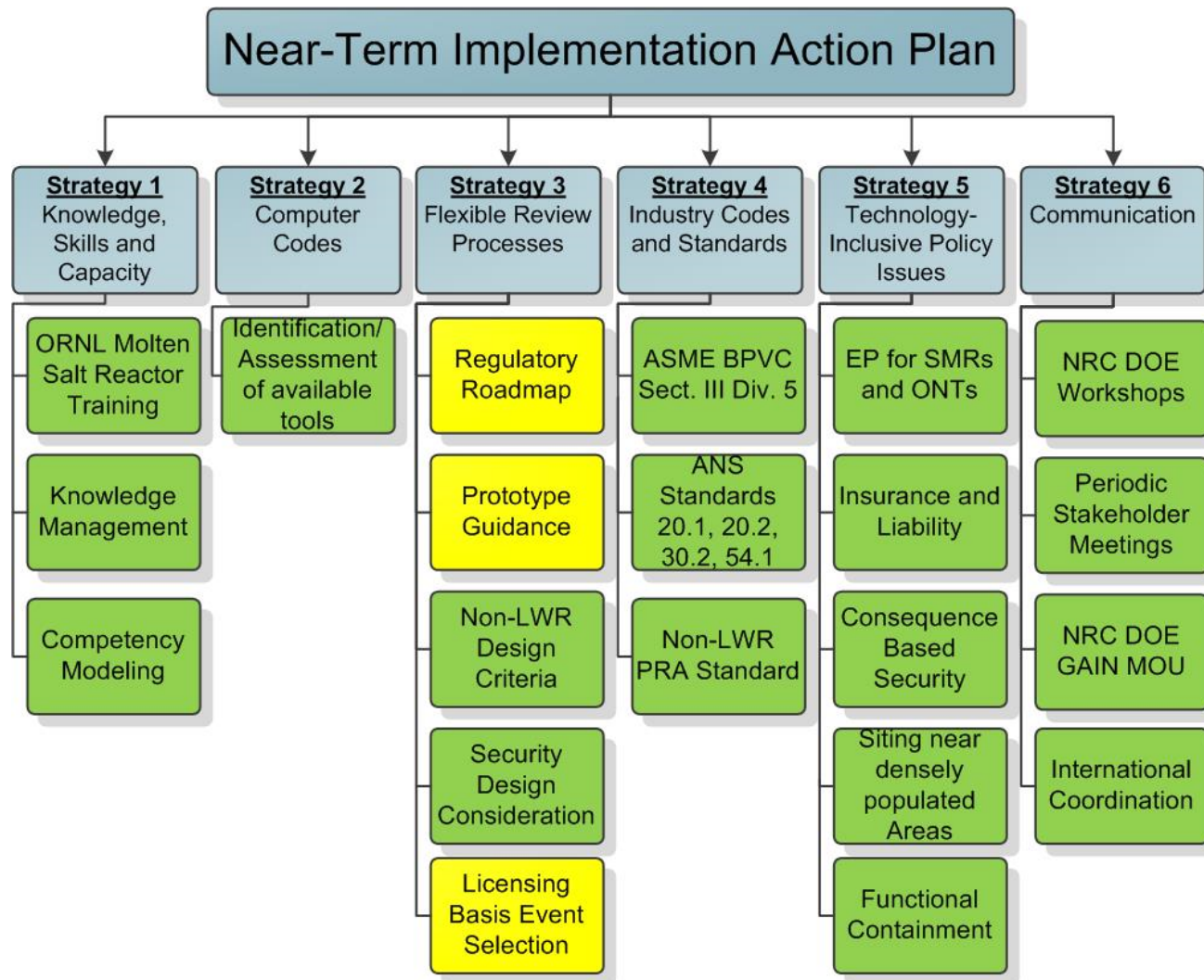
# Draft RG Highlights

- DG-1330 provides guidance to reactor designers, applicants, and licensees of non-LWR designs for developing principal design criteria (PDC).
- Non-LWR applicants would not need to request an exemption from the GDC in 10 CFR Part 50 when proposing PDC for a specific design.
- Non-LWR applicants may use DG-1330 to develop all or part of the PDC and are free to choose among the ARDC, SFR-DC, or mHTGR-DC to develop each PDC.

---

# Future Activities

- Public meeting to discuss public comments and final RG content was held on August 24, 2017.
- ACRS meetings (Full and Subcommittee) scheduled early 2018.
- Final regulatory guide issuance planned for spring 2018.



## Strategy 3 – Contributing Activities

Contributing Activity		Approach & Status
1	Establish criteria for safety-security-environmental findings	<ul style="list-style-type: none"> <li>➤ Utility-led Licensing Modernization Project preparing series of white papers (licensing basis events, PRA, defense in depth)</li> <li>➤ Subsequent development of NEI paper on risk-informed, performance-based approach for NRC review and endorsement in regulatory guide</li> </ul>
2	Determine appropriate licensing bases and accident sets	
3	Identify and resolve gaps in regulatory framework	
4	Develop regulatory review “roadmap”	<ul style="list-style-type: none"> <li>➤ Draft issued in October 2016. Revision being prepared, including reference to paper on “major portions” for scope of SDA</li> </ul>
5	Update prototype guidance	<ul style="list-style-type: none"> <li>➤ Draft issued in June 2017 and discussed at stakeholder meeting in August 2017. Revision to be prepared</li> </ul>
6	Engage on technology- or design-specific regulatory engagement plans (REPs)	<ul style="list-style-type: none"> <li>➤ Received specific REPs to support preapplication interactions</li> <li>➤ NEI preparing outline for preparing REPs</li> </ul>
7	Support longer-term efforts to develop, as needed, new regulatory framework	<ul style="list-style-type: none"> <li>➤ Tracking regulatory gaps, policy issues to help determine potential benefits of developing new regulatory framework (e.g., Part 53)</li> </ul>

---

# Pre-Application Activities

- Pre-application underway with Oklo, Inc.
- Core review team approach
- Responses to RIS 2016-08
  - Oklo
  - Terrestrial
  - Transatomic
  - TerraPower
  - X-energy

---

# Stakeholder Engagement

- Seeking stakeholder feedback at all steps
- Three joint NRC/DOE Workshops
- Stakeholder meetings every ~6 weeks
- Memorandum of Understanding with DOE for Gateway for Nuclear Innovation (GAIN)
- Information from prospective applicants informs budget, schedule, and priorities
- International coordination



---

# Other Upcoming Activities

- Commission papers
  - IAP status: late 2017
  - Functional containment: early 2018
  - Physical security: later in 2018
- Siting white paper
- Emergency preparedness rulemaking
- Insurance and liability

---

# Summary

- Vision and Strategy sets high level goals and objectives to achieve readiness
- We have transitioned from planning to execution
- Key challenges:
  - Budget uncertainty
  - Applicant uncertainty