Advanced Reactor Codes and Standards Collaborative (ARCSC)

Current Progress, Future Actions

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Codes and Standards & ARCSC Co-Chair

New & Advanced Reactors: Codes & Standards Meeting, 4 April 2024 Washington DC

Presentation Objectives

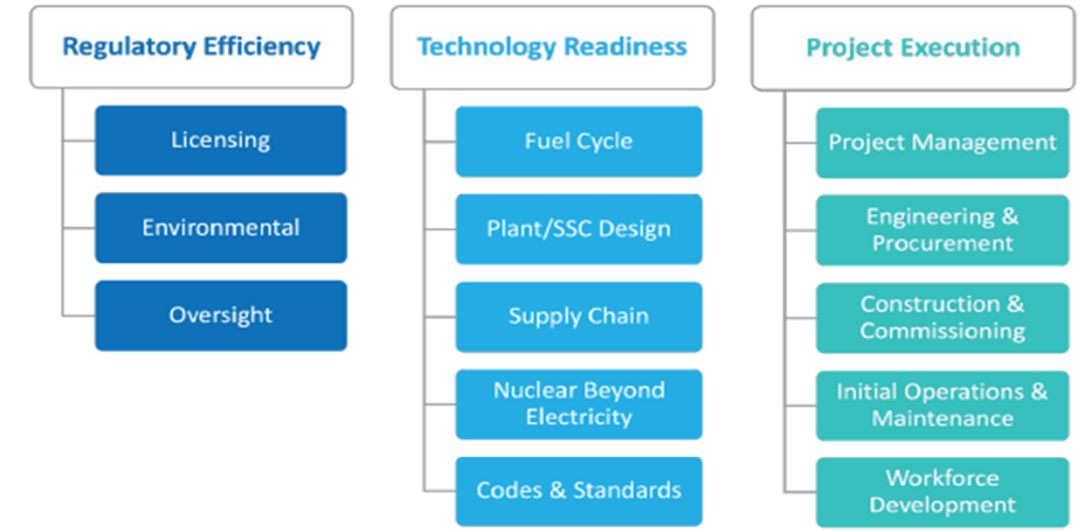
- North American Advanced Reactor Roadmap
- ARCSC Charter and Goals
- 2023 Accomplishments, 2024 Projected Activities
- Overall Assessment Process/Survey
- Survey Initial Results
- Future Actions

North American Advanced Reactor Roadmap

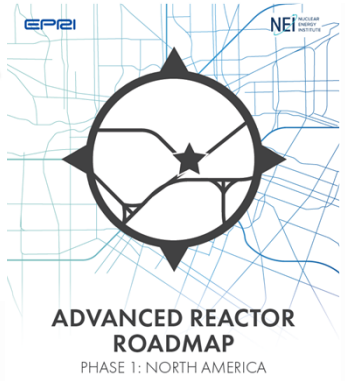
Achieve successful deployment of advanced reactors through a shared industry strategy

Align organizations and foster collaboration to implement the strategy

Serve government, academic, industrial, and public stakeholders



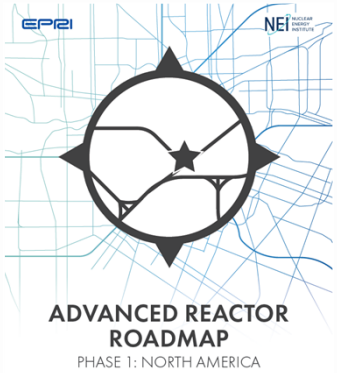
ARCSC and its constituent SDOs and stakeholders interface with the Roadmap through the Codes & Standards element.



ARCSC Establishment and Membership

Formed in fall 2022 through efforts of ANS, ASME, CSA, NEI, EPRI

NEI/EPRI to facilitate the logistics and support the operation of the Advanced Reactors Codes and Standards Collaborative (ARCSC) to implement the Codes and Standards (C&S) actions identified in the North American Advanced Reactor Roadmap action plans and implemented through the Implementation Board.



ARCSC Members currently comprised of U.S. and Canadian organizations to streamline the use of C&S in designs deployed in both countries.

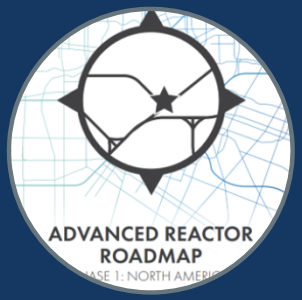
- Co Chairs: Larisa Logan CSA Group; Kate Hyam, ASME
- Leadership Team: Mark Richter, NEI; Andrew Sowder, EPRI; Don Eggett, ANS and Frankie Pimentel, NEI, both Implementation Board members
- Members are volunteers representing SDOs (ANS, IEEE, ASME, ASCE, AISC, CSA, WNA)
- Observing members from multiple organizations and government agencies including U.S. Department of Energy, Nuclear Regulatory Commission, IEC, INPO

ARCSC Charter and Goals

Share information
on AR standards development among SDOs and stakeholders

Identify needs:
gather stakeholder input; identify gaps being addressed by SDOs; assess remaining gaps and identify actions and resources needed

Inform and complement
relevant international & national efforts (e.g., IAEA NHSI, WNA CORDEL)



Input to Roadmap Implementation Board to **align actions** with NEI/EPRI North American Advanced Reactor Roadmap

Objectives

Mission: To ensure the development, alignment and timely availability of U.S., Canadian and international codes and standards needed to support large-scale advanced reactor deployment.

ARCSC Activities to date

- Kickoff Workshop

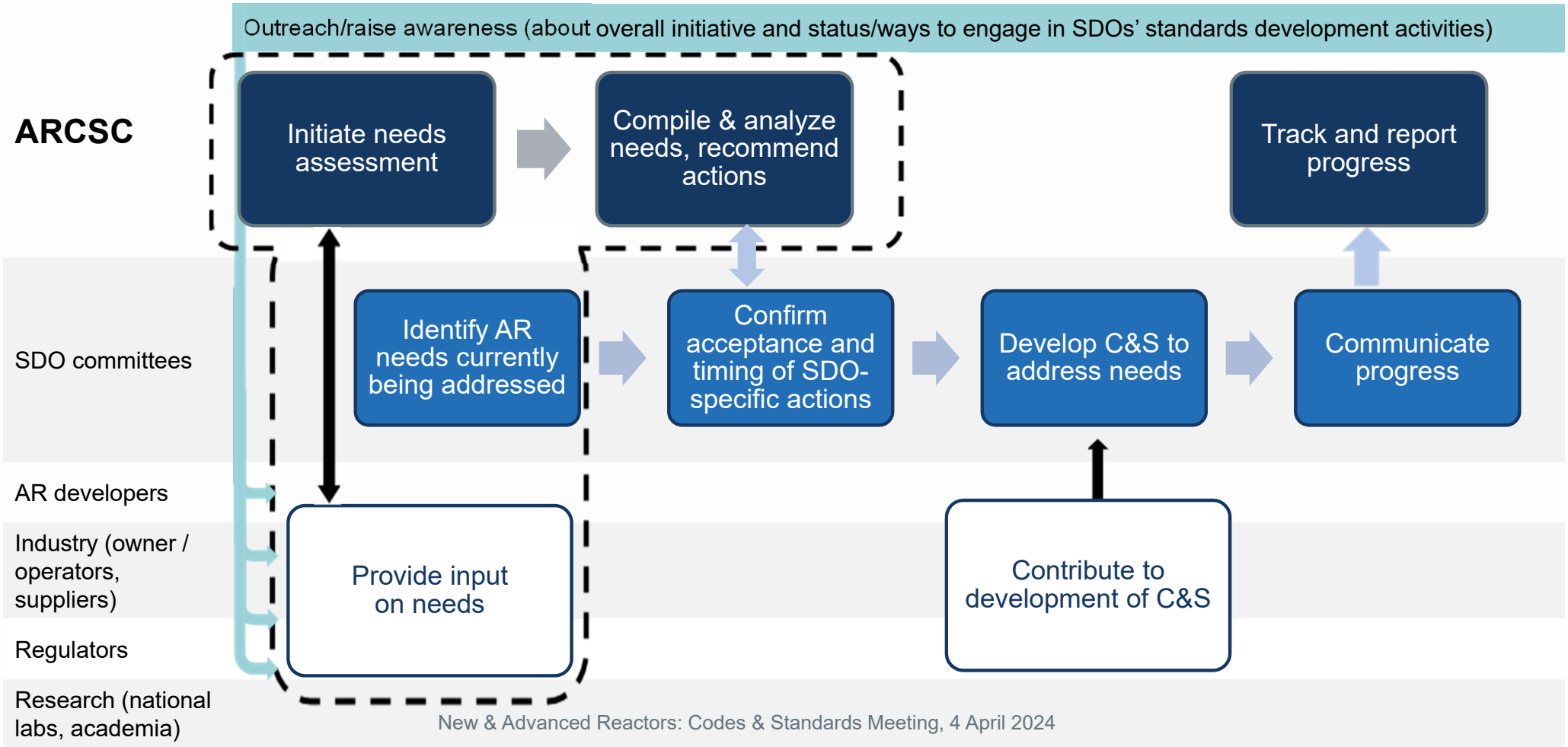
- Charter Developed
- Process Developed
- Collection of relevant standards

- Survey initiated
- Survey Data Collected
- Evaluation to continue

- Second Annual Workshop to share preliminary survey results.

- ARCSC Website deployed https://arcsc.nei.org/

ARCSC Overall Process



Collection of Relevant Standards

18 Standards Development Organizations (SDOs) Contacted

1. American Concrete Institute (ACI)
2. American Institute of Steel Construction (AISC)
3. American Nuclear Society (ANS)
4. American Society of Civil Engineers (ASCE)
5. American Society of Mechanical Engineers (ASME)
6. ASTM International (ASTM)
7. American Society for Quality (ASQ)
8. American Welding Society (AWS)
9. CSA Group (CSA)
10. Health Physics Society (HPS)
11. Institute of Electrical and Electronics Engineers (IEEE)
12. Institute of Environmental Sciences and Technology (IEST)
13. Institute of Nuclear Materials Management (INMM)
14. International Society of Automation (ISA)
15. Manufacturers Standardization Society (MSS)
16. National Fire Protection Association (NFPA)
17. National Electrical Manufacturers Association (NEMA)
18. Nuclear Information and Records Management Association (NIRMA)

Green (14): List provided
Blue (2): Responded NA
Orange (2): No response
~1000 standards on master list

Survey: key questions

Structured around 6 topical areas

- Design and Construction
- Inspection and Testing
- Management and QA Programs
- Safety Systems and Risk Analysis
- Operations and Maintenance
- Fuel

Within topical areas:

- What standards are being used?
- What are gaps in existing standards?
- What are other standards gaps (e.g., lack of standards)?

ARCSC Website – Launched in February 2024

http://arcsc.nei.org

Future ARCSC Activities

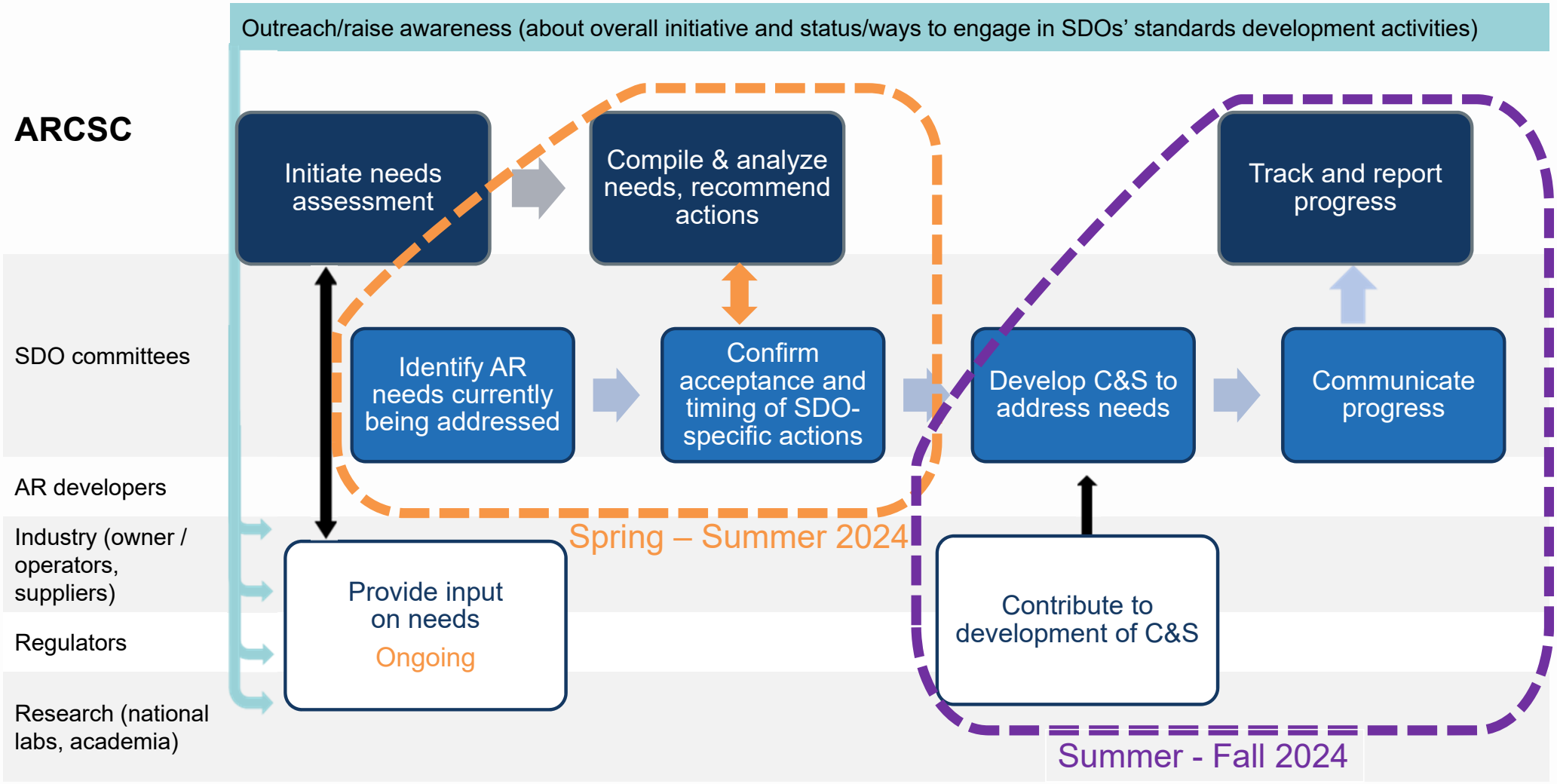
- SDOs received Survey Results, continue data evaluation.
- ARCSC in process of evaluating Overarching Topics

- Feedback from SDOs collected including identification of research needs

- Prioritizations forwarded to North America AR Roadmap Implementation Board

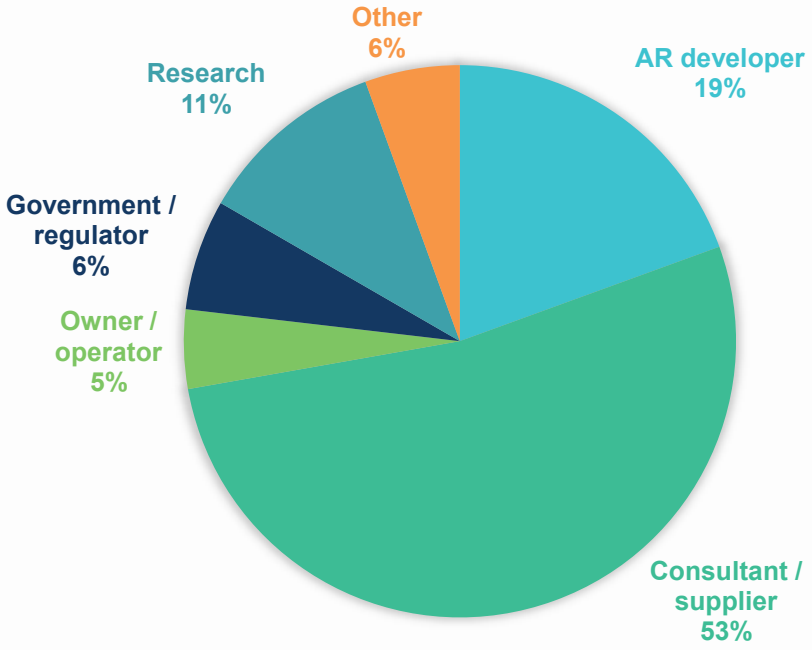
- Workshops
- NEA September 2024
- Virtual/Hybrid Event later in 2024

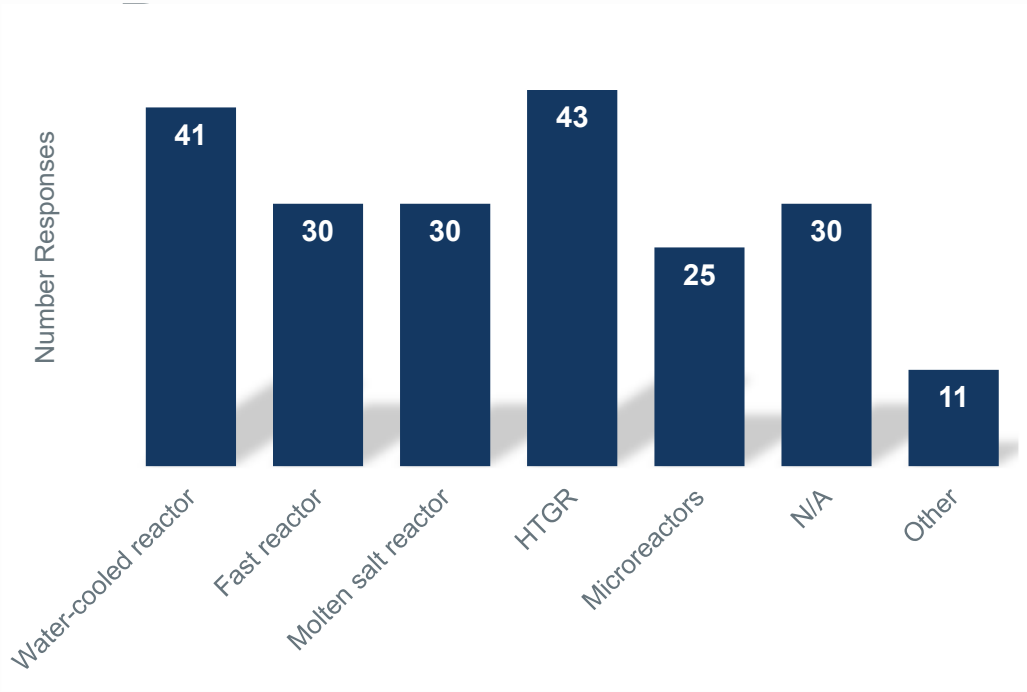
Identify C&S Needs: Next steps - SDO committee(s) disposition of survey results



Survey Responses – General

- **103 responses** as of November 1
- Approximate interest category distribution



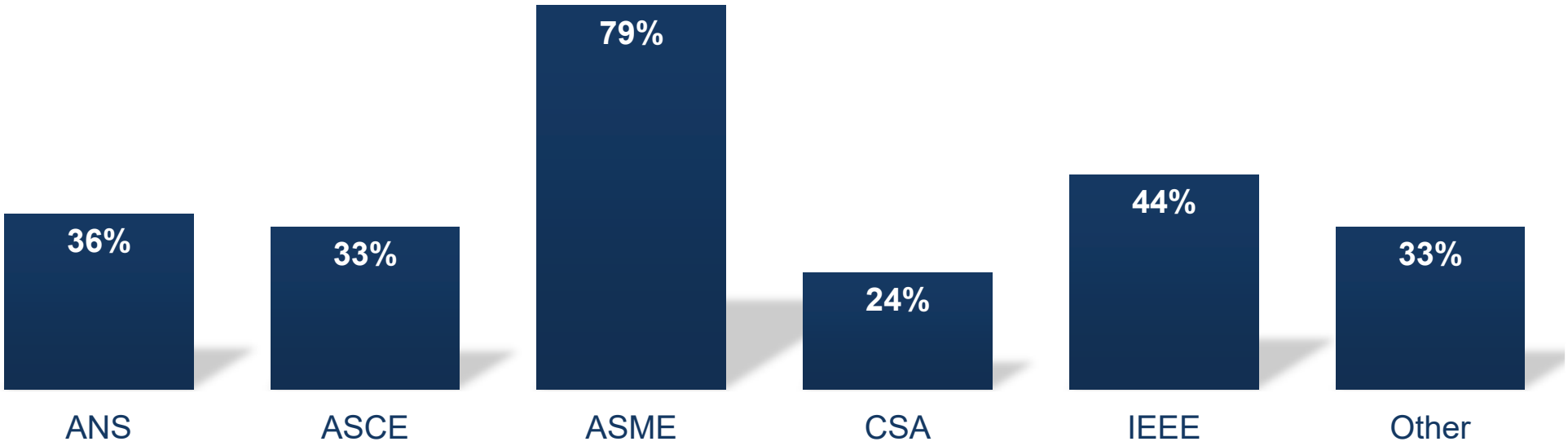


Survey Responses – Topical Areas

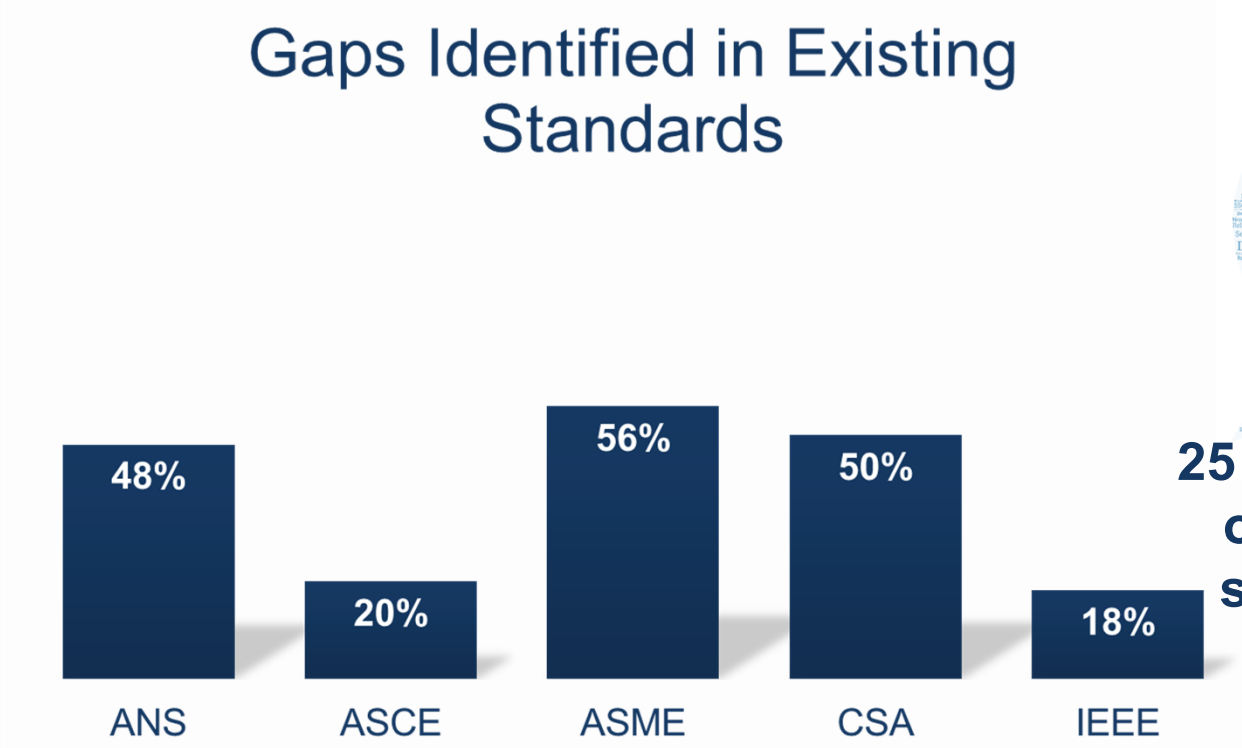
Respondents Applying Standards per Topical Area

Survey Responses – Design and Construction

Respondents Applying SDOs' Standards for Design and Construction

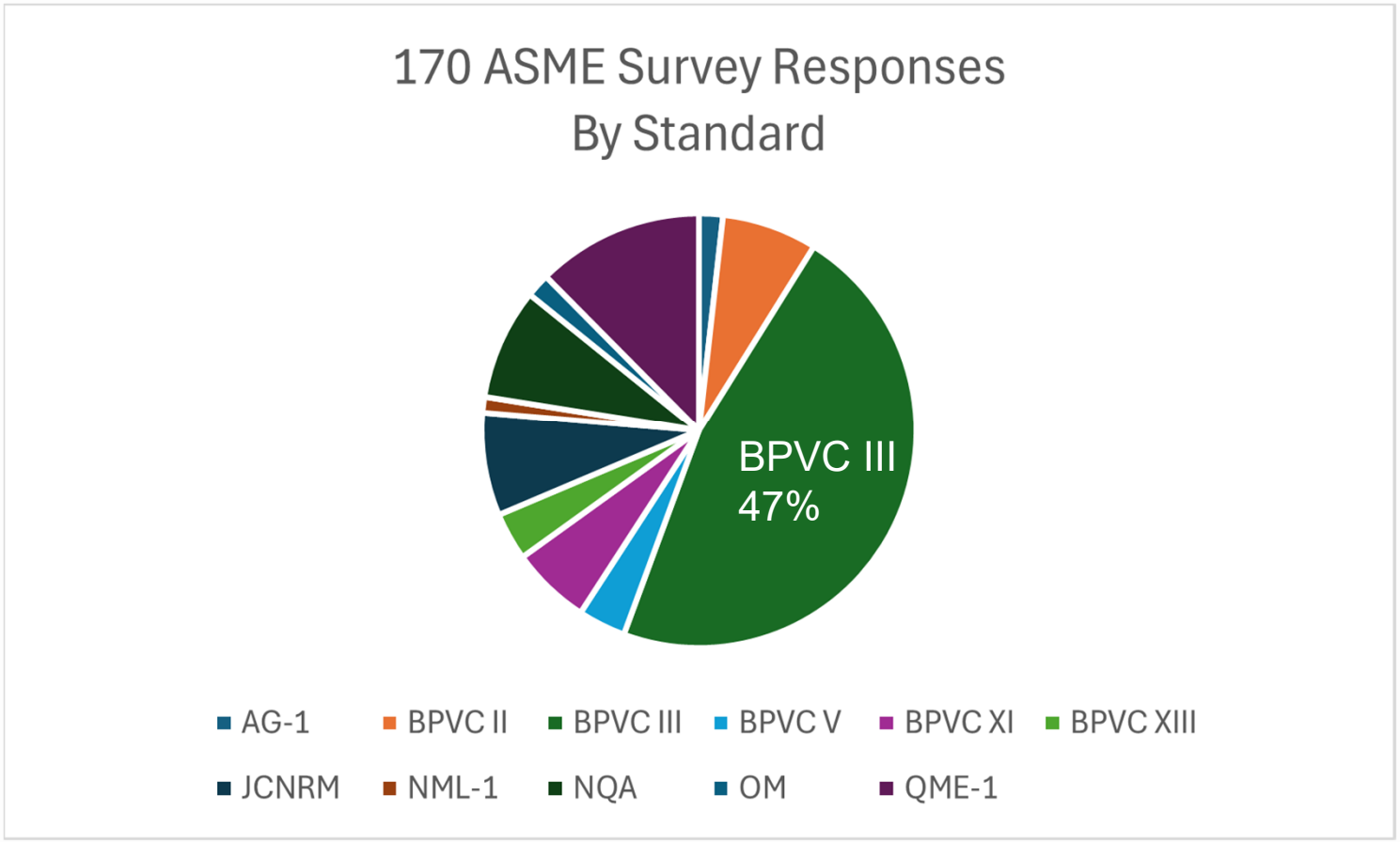


Survey Responses – Design and Construction



25 comments on lack of standards

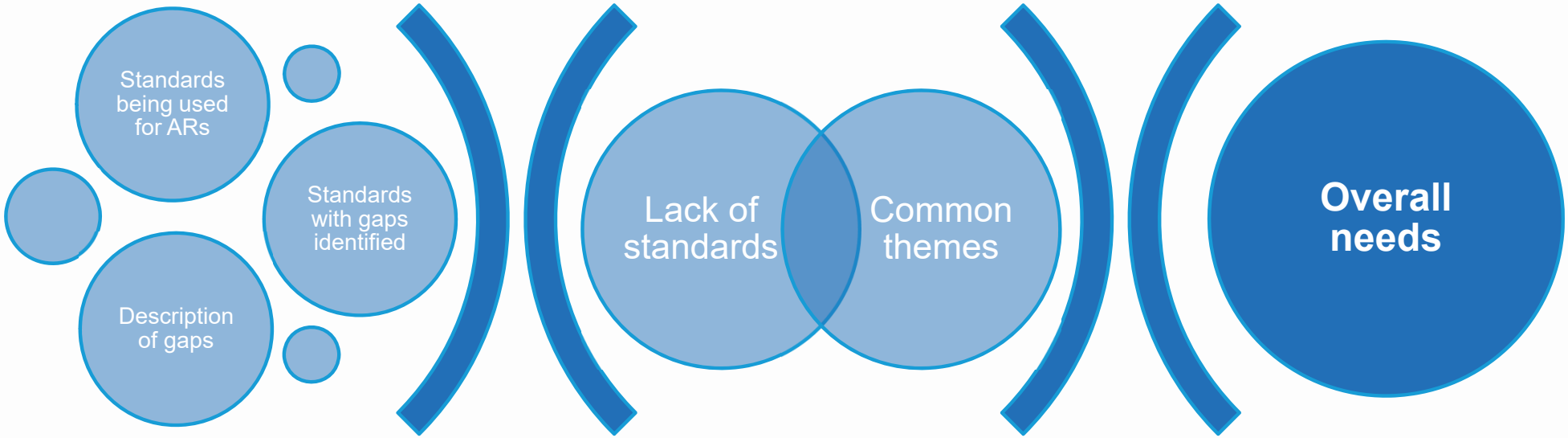
Survey Responses – ASME Standards



AR Industry Insights for ASME Standards

- Materials
  - Property data
  - Non-metallics (e.g. graphite)
  - High temperature materials creep-fatigue considerations
- Code Classification
- Requests for publication of pending standards and revisions to standards. (e.g. OM-2 and QME-1)

Survey and Workshop Results – Types of Insights



SDO-specific responses:
Action on SDOs

Cross-cutting responses:
Analysis by ARCSC

Future – Design Once, Build Everywhere

Design once and build everywhere is our aspirational goal in which codes and standards are a valuable enabler

Worldwide acceptance of codes and standards that address advanced reactor needs will support design and licensing

ARCSC needs stakeholder input! (Emphasis added)

- Support SDO-led ARCSC needs and priority surveys
- Engage in and support periodic workshops to help advance the Advanced Reactors Roadmap action plans
- Participate in codes and standards development meetings

"Advanced Reactor Codes & Standards Collaborative (ARCSC)
A multi-organization campaign dedicated to accelerating the development of industry consensus standards for the advanced nuclear power generation systems"

Thank you!

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