

# Advanced Reactor Codes and Standards Collaborative (ARCSC)

## Current Progress, Future Actions

Kate Hyam, ASME Director of Nuclear, Clean Energy, Power and Facilities  
Codes and Standards & ARCSC Co-Chair

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

# Presentation Objectives

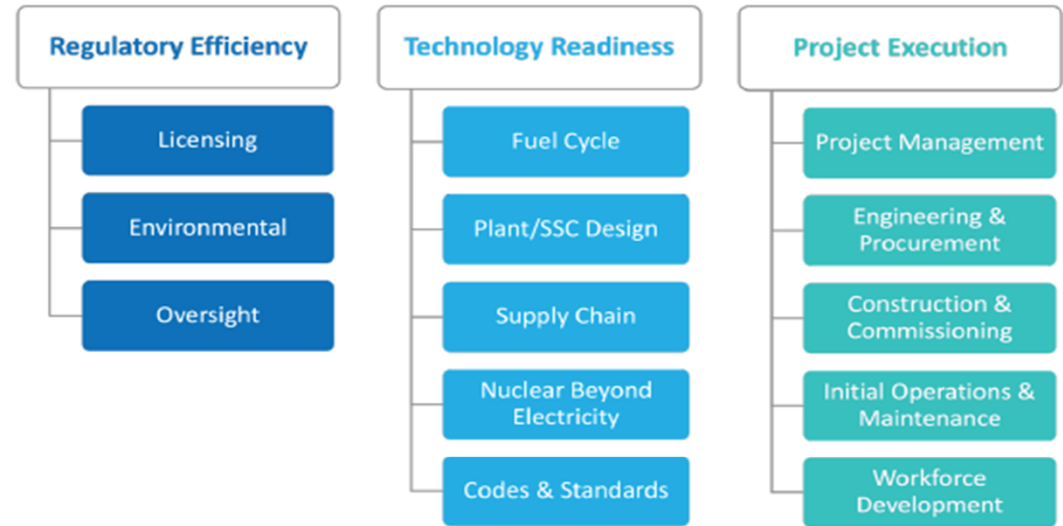
- North American Advanced Reactor Roadmap
- ARCSC Charter and Goals
- 2023 Accomplishments, 2024 Projected Activities
- Overall Assessment Process/Survey
- Survey Initial Results
- Future Actions

# North American Advanced Reactor Roadmap

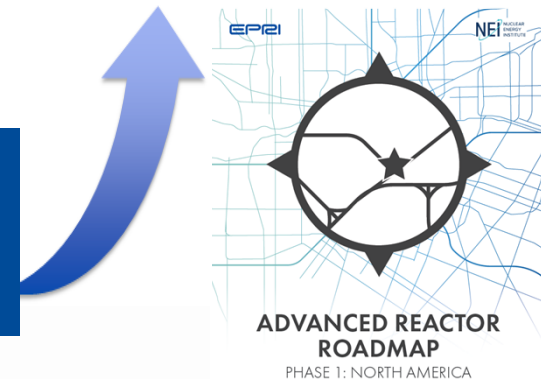
Achieve successful deployment of advanced reactors through a shared industry strategy

Align organizations and foster collaboration to implement the strategy

Serve government, academic, industrial, and public stakeholders



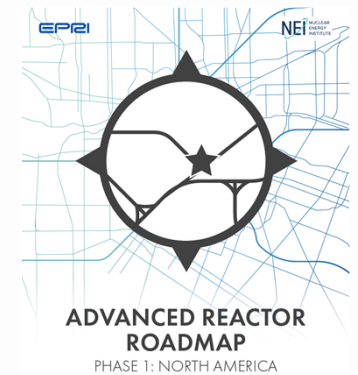
**ARCSC and its constituent SDOs and stakeholders interface with the Roadmap through the Codes & Standards element.**



# 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



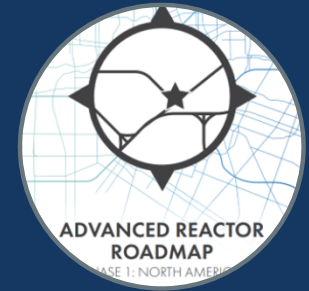
**Share information**  
on AR standards  
development among  
SDOs and stakeholders



**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)

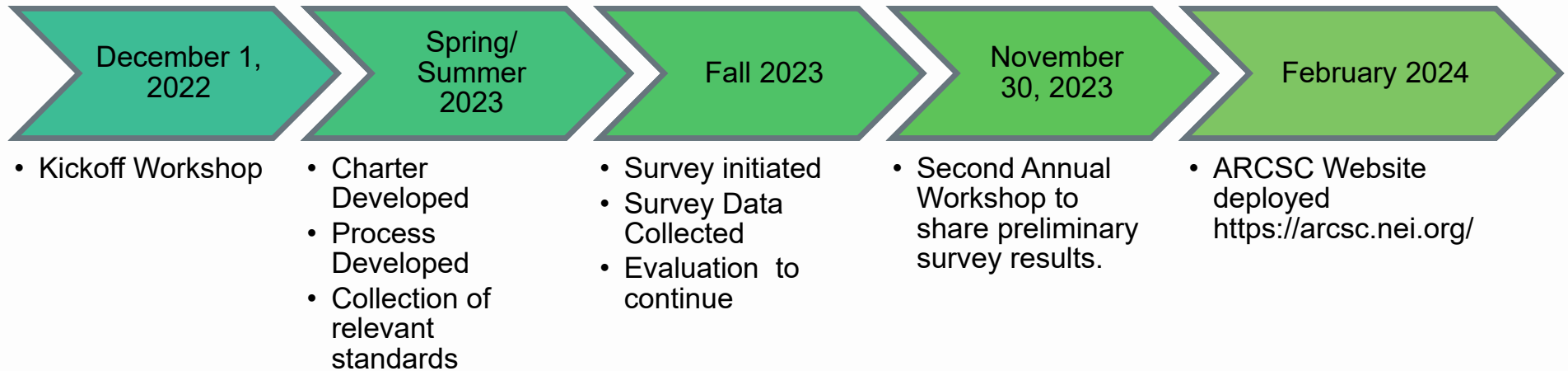


Input to Roadmap  
Implementation Board to  
**align actions**  
with NEI/EPRI North  
American Advanced  
Reactor Roadmap

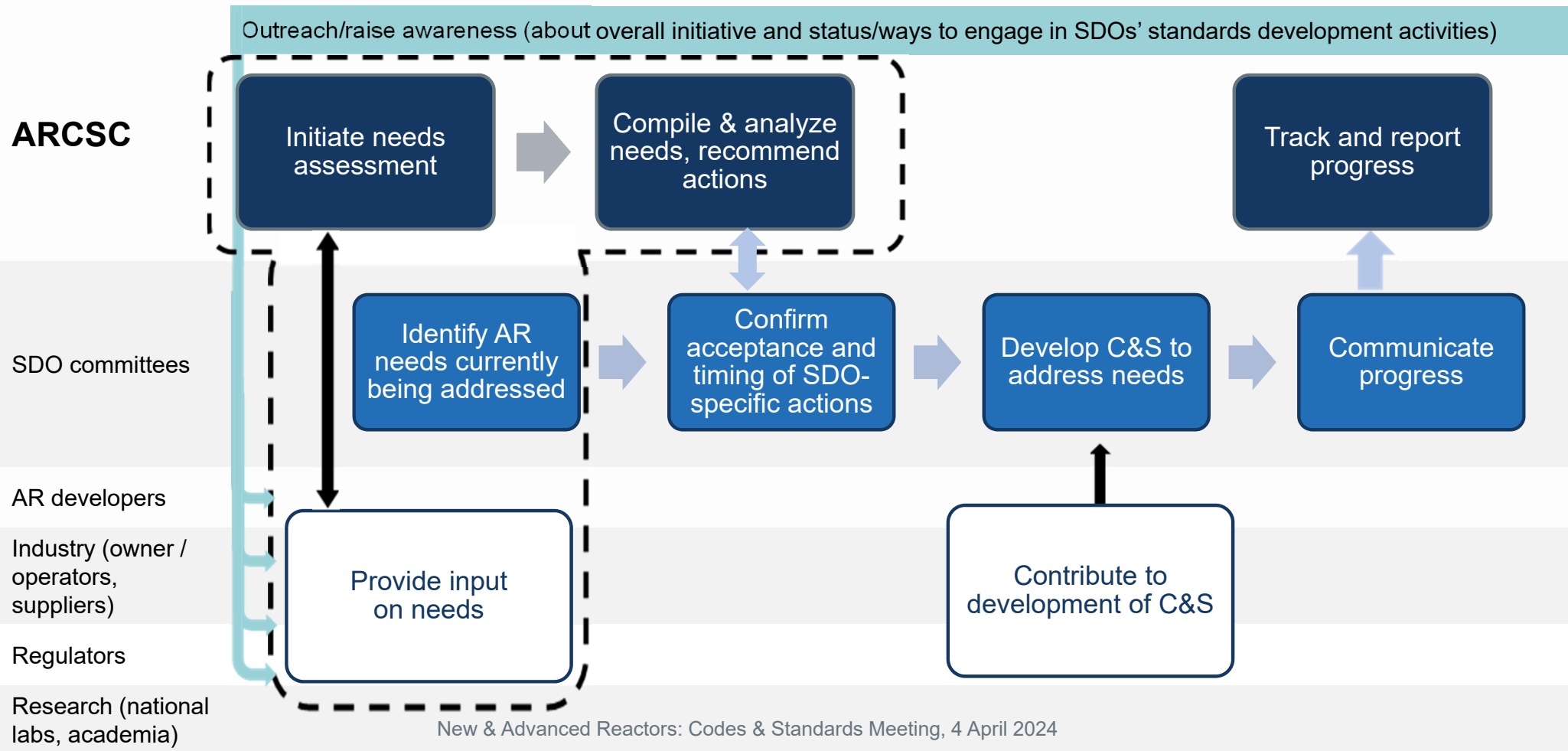
## Objectives

**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



# 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)?

## Advanced Reactors Codes and Standards Collaborative - Needs Assessment

Thank you for providing your input on needs and gaps for advanced reactors codes and standards (C&S) to the Advanced Reactors Codes and Standards Collaborative ("The Collaborative").

### About the Collaborative

The Collaborative came together in late 2022 to ensure the development, alignment, and timely availability of U.S., Canadian, and international codes and standards (C&S) needed to support large-scale advanced reactor deployment. The Collaborative's objectives are to facilitate information sharing between standards development organizations (SDOs) and industry, identify and gather advanced reactor developer standards needs, inform and complement international and national C&S efforts, and align actions with the NEI/EPRI North American Advanced Reactor Roadmap.

### About the Needs Assessment

Responses will be used by the Collaborative to inform the identification, prioritization, and assignment of actions to address C&S needs. All responses will be aggregated and will not be attributed when shared beyond the Collaborative, including in future stakeholder workshops. Following this survey, the Collaborative is planning a public workshop tentatively to be held November 30, 2023 in Washington D.C.

Should you have specific questions as to the Collaborative's objectives or this survey, contact either:

Kathryn Hyam ([hyamk@asme.org](mailto:hyamk@asme.org)), Collaborative Co-Chair  
Larisa Logan ([larisa.logan@csagroup.org](mailto:larisa.logan@csagroup.org)), Collaborative Co-Chair  
Mark Richter ([mar@nei.org](mailto:mar@nei.org)), Collaborative Facilitator

Thank you in advance for your input and support of this effort.

\* Required

### Contact information

1. Full Name \*

Enter your answer

2. Title \*

Enter your answer

3. Organization \*

Enter your answer



# ARCSC Website – Launched in February 2024

<http://arcsc.nei.org>

ARCSC Home About Projects Events Grants Contacts

ARCSC  
Advanced Reactor Codes & Standards Development

## Advanced Reactor Roadmap Codes and Standards Technology Readiness

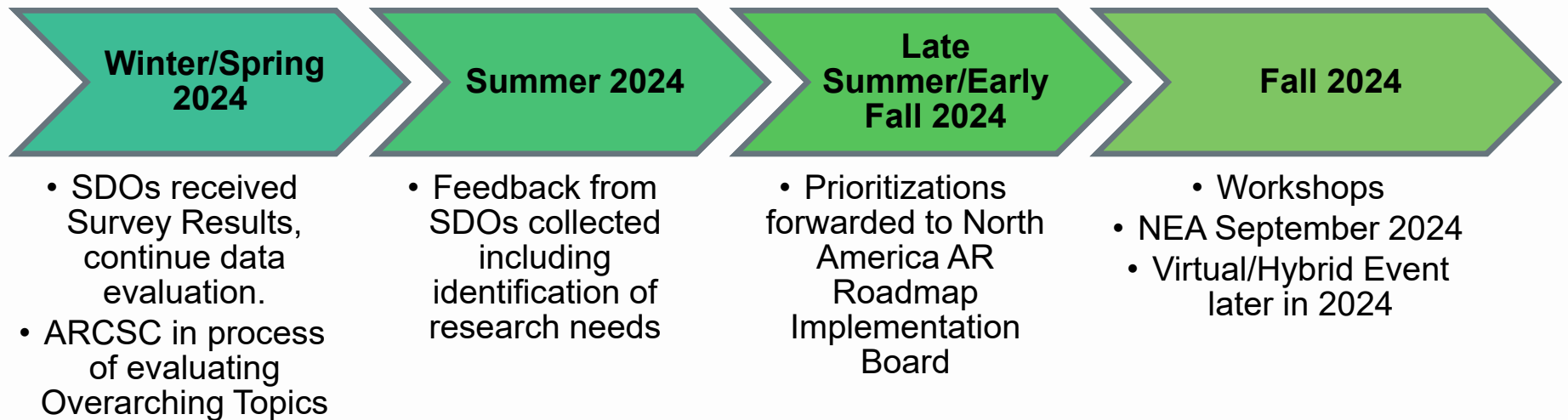
Consensus codes and standards (C&S) provide acceptance criteria, methodologies, processes, and other data based on the accumulated experience of the industries they serve and documented by subject matter experts. The design of advanced reactors (AR) and a new generation of nuclear reactor construction challenge the context and numerous assumptions that the current consensus codes and standards are based upon. The purpose of this effort is to identify the most critical codes and standards needs, in order to successfully deploy advanced reactors in North America in the 2030s.

**[Provide your input on the Needs Assessment Survey](#)**

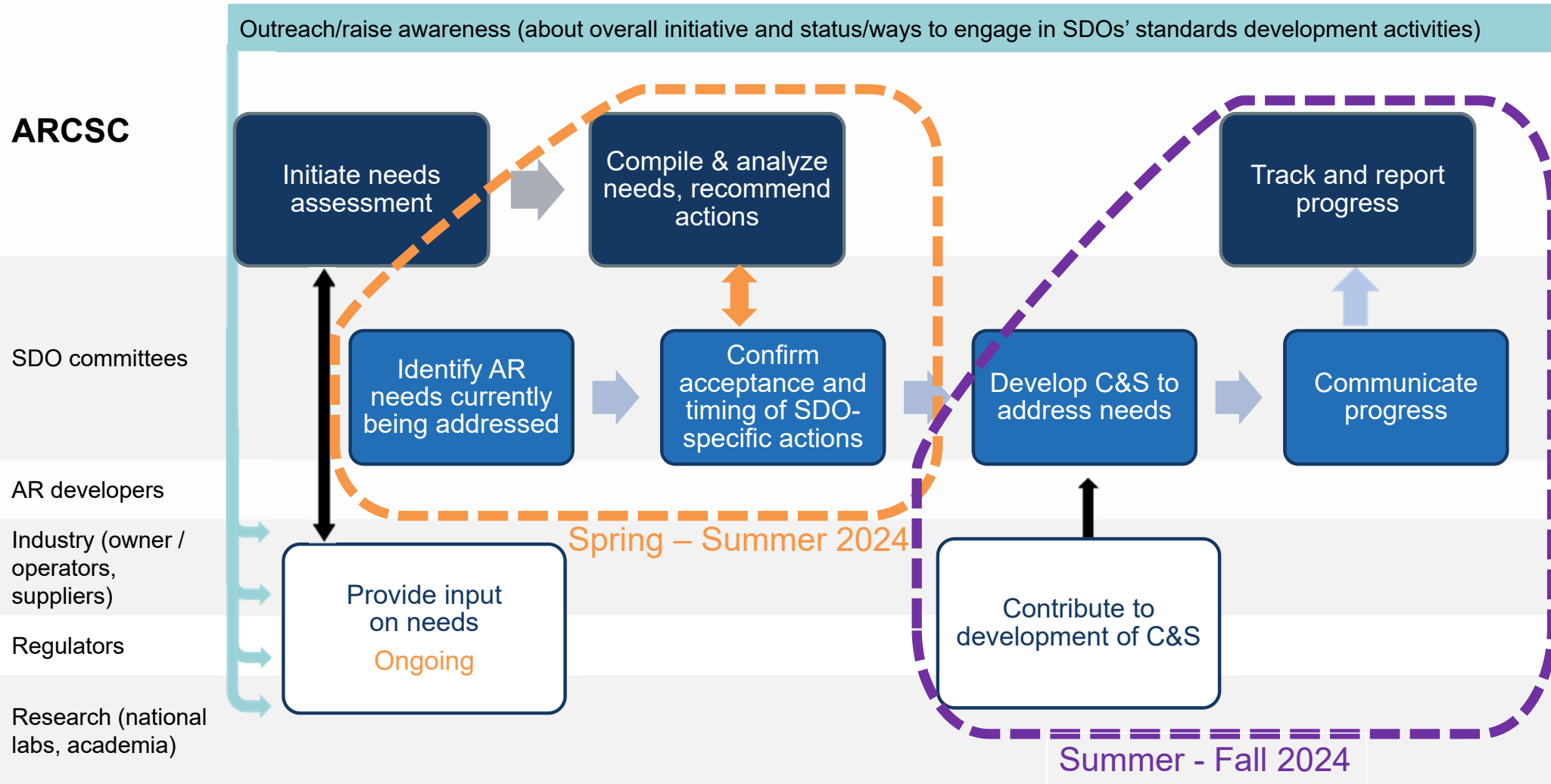
- About
- Charter
- Member Organizations
- Projects Status
  - Nuclear Codes and Standards List
  - Standards Development
  - Organization Contacts
  - Needs Assessment Survey
- Events
- Grants

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

# Future ARCSC Activities

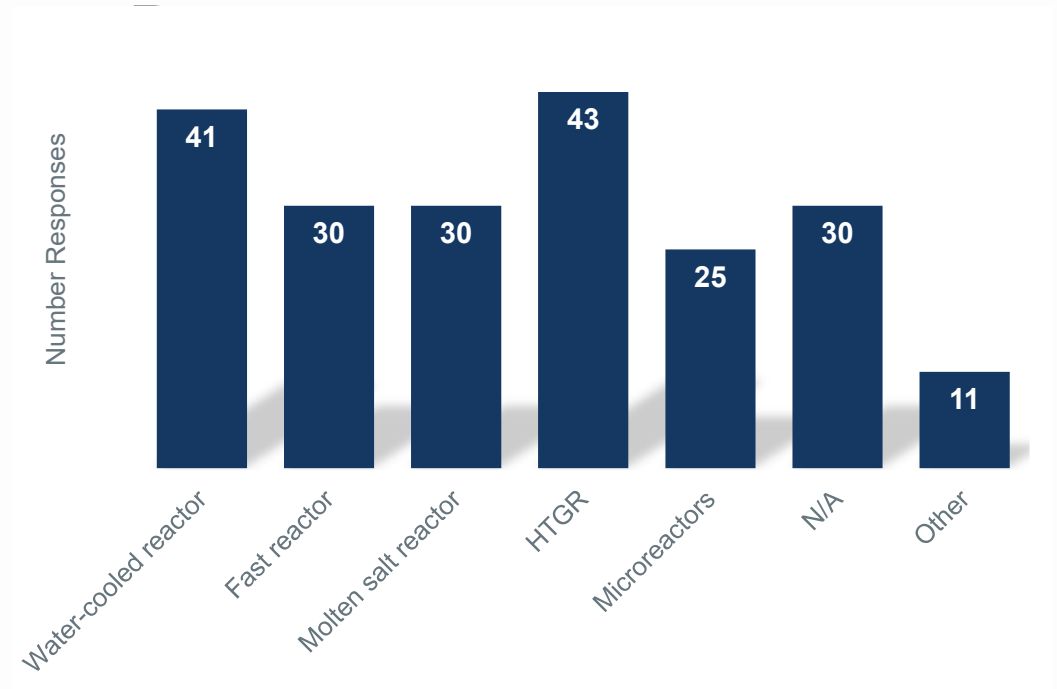
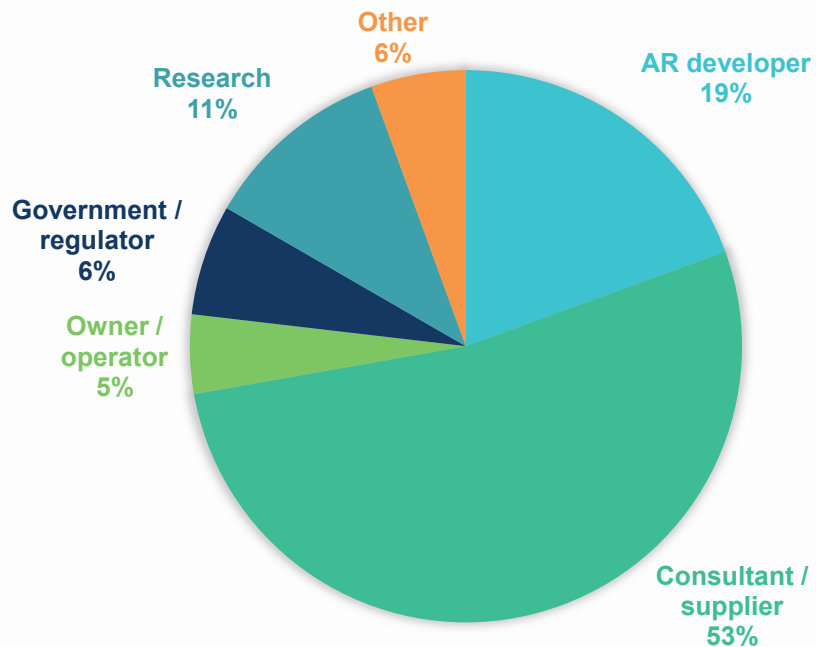


## Identify C&S Needs: Next steps - SDO committee(s) disposition of survey results



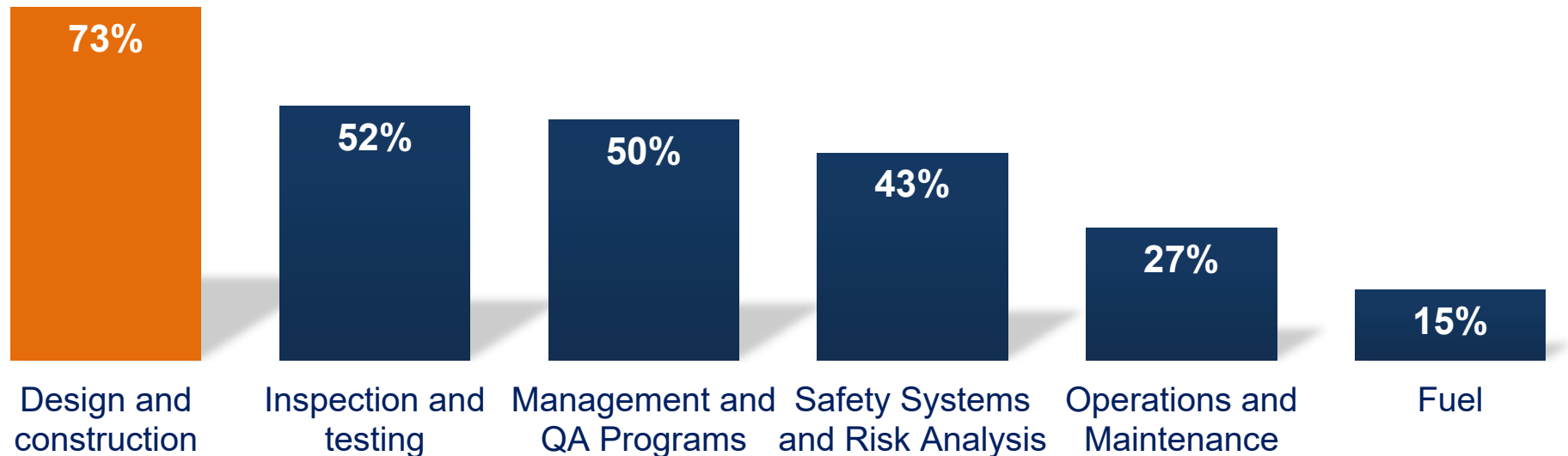
# Survey Responses – General

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



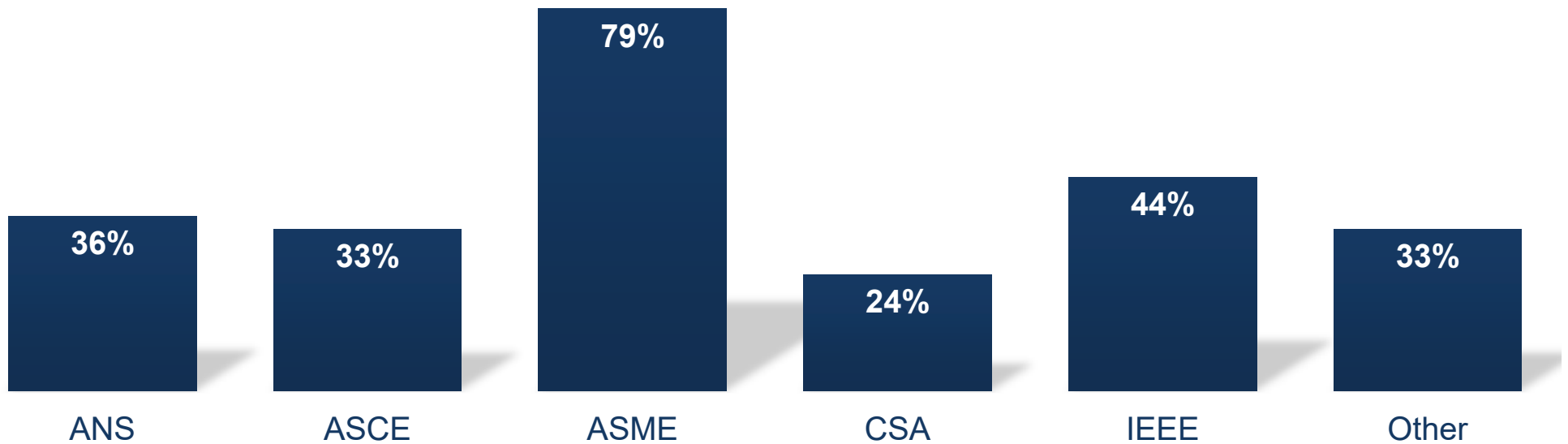
# Survey Responses – Topical Areas

## Respondents Applying Standards per Topical Area



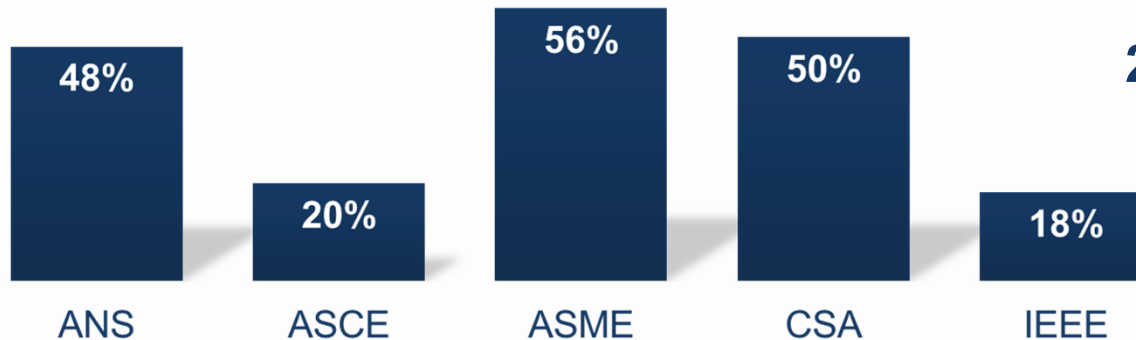
# Survey Responses – Design and Construction

## Respondents Applying SDOs' Standards for Design and Construction



# Survey Responses – Design and Construction

## Gaps Identified in Existing Standards

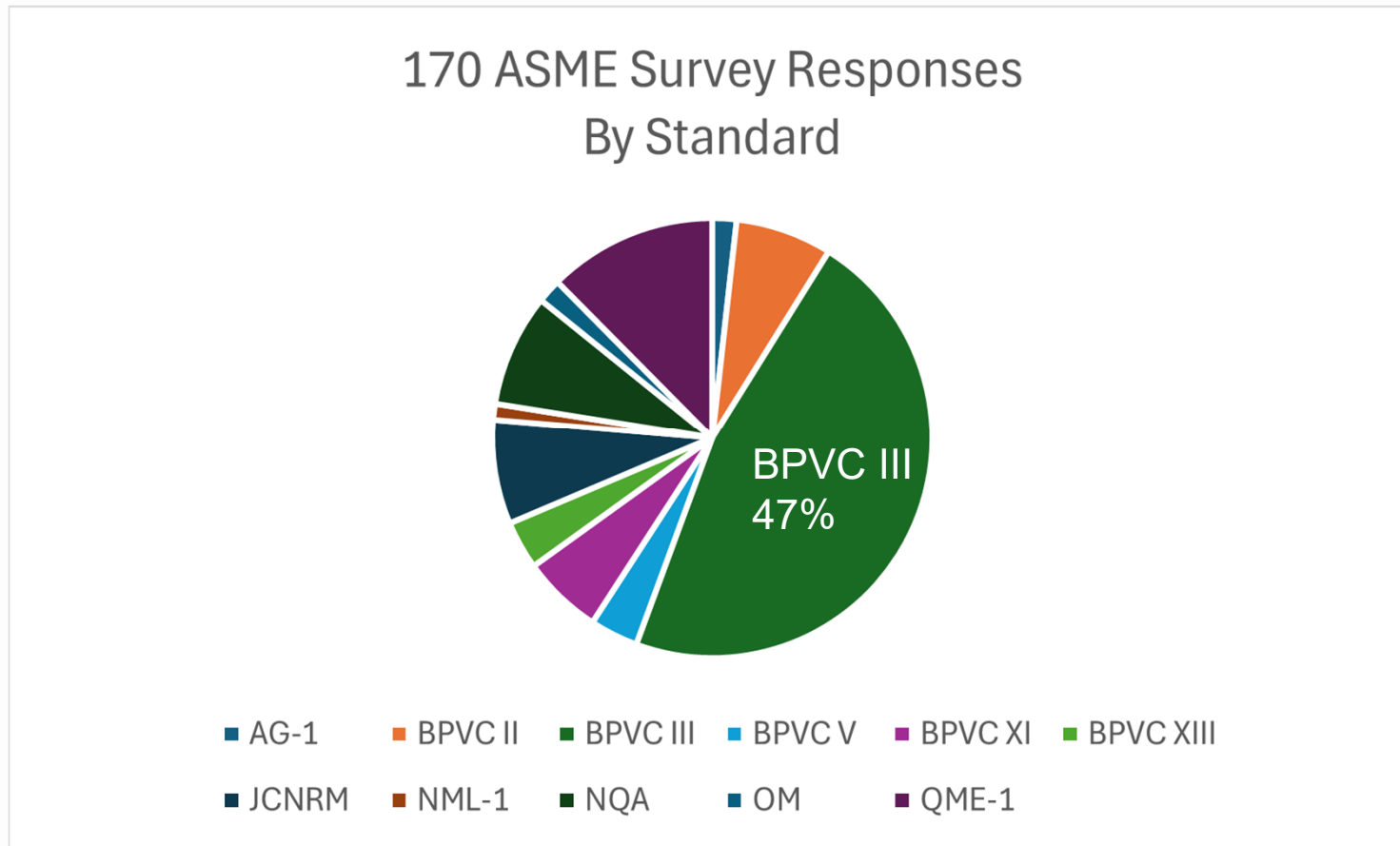


**25 comments  
on lack of  
standards**





# Survey Responses – ASME Standards

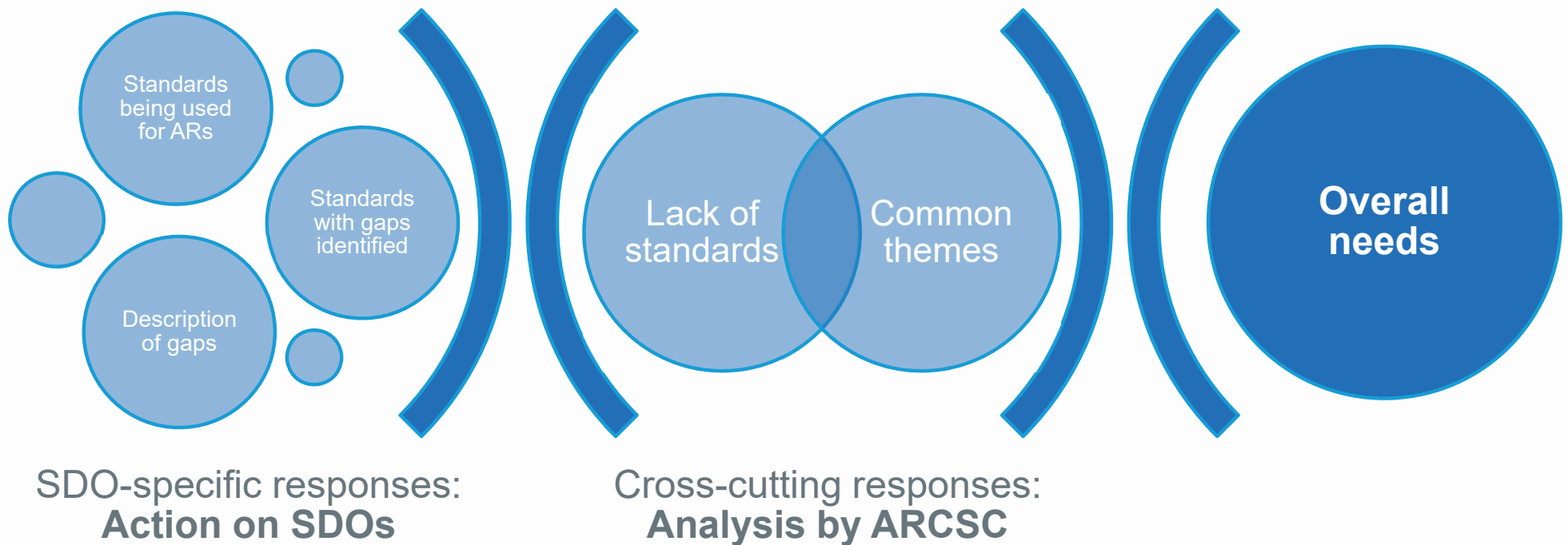


# AR Industry Insights for ASME Standards

- 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



# 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!

## Contacts

Larisa Logan, ARCSC Co-Chair [larisa.logan@csagroup.org](mailto:larisa.logan@csagroup.org)

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