



Proposal to Establish Alternate Requirements for Components Commensurate with Safety and Risk

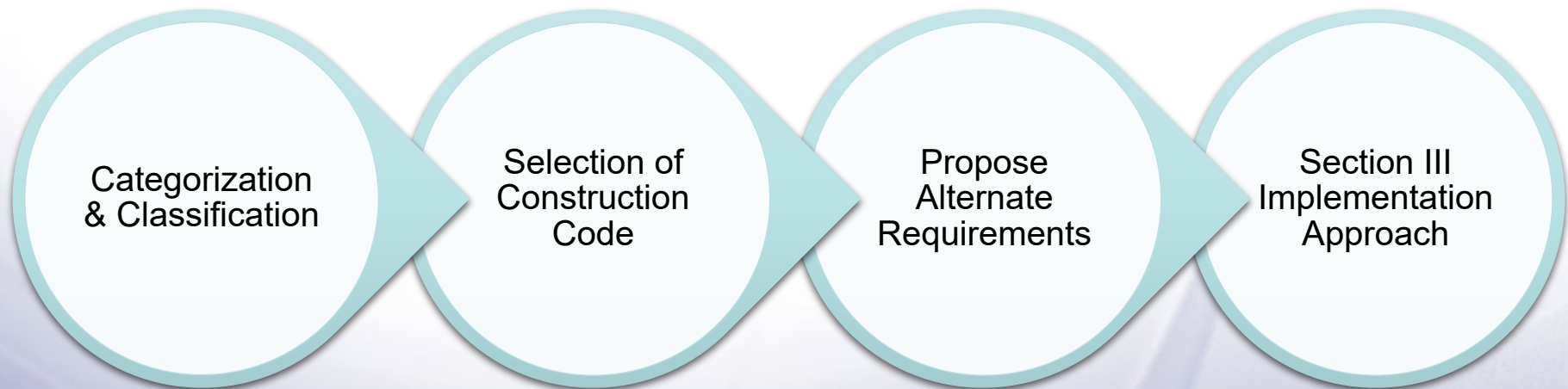
**NRC Public Meeting
November 14, 2022**

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MPR Associates**

Introduction

Purpose:

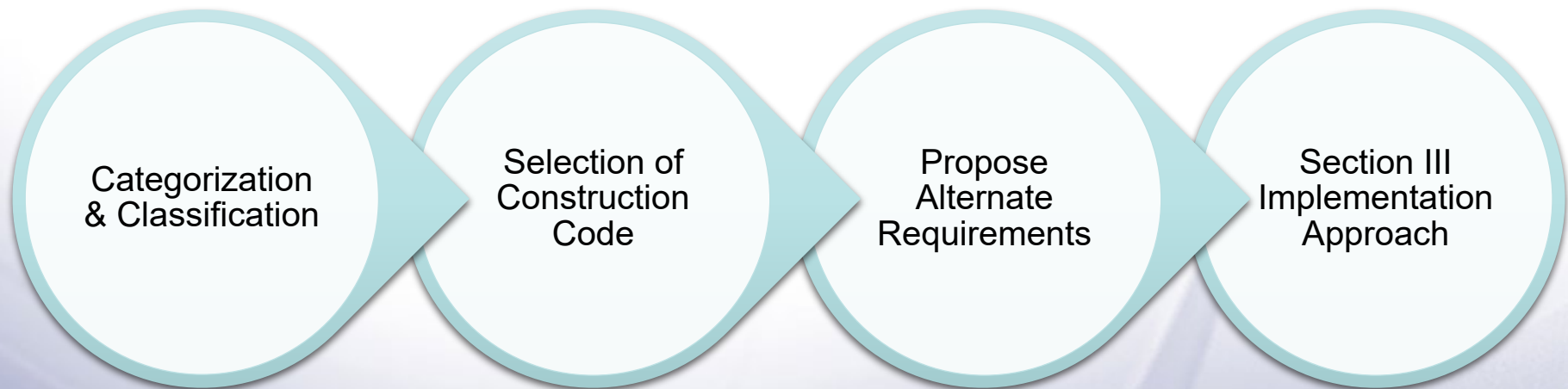
Discuss the technical basis for proposed alternate requirements for the construction of ASME Section III nuclear items commensurate with an item's contribution to safety or risk



Introduction



Desired Outcome:

Open and interactive discussion of viewpoints on technical basis and Section III approach to rules for these items and potential regulatory avenues for endorsement



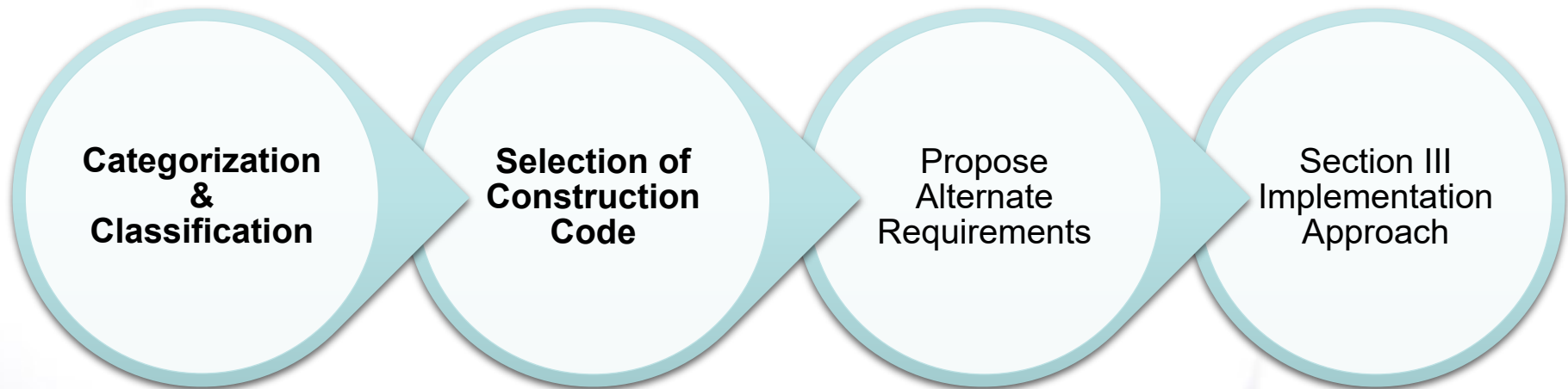
Section III Approach Summary

- Section III is developing alternative requirements commensurate with an item's contribution to safety and risk (e.g., NEI 18-04)
 - Results in increased value for construction
 - Aligned with the design needs of advanced reactors

ASME Section III	Industrial Codes + Additional Requirements
 Rules well suited for nuclear applications	 Value commensurate with item's contribution to safety and risk

Review and Discussion of Proposed ASME III Alternate Requirements for Construction

Background



Categorization & Classification

- Traditional categorization process is deterministic:
 - Safety Related or Non-Safety Related
- Risk-based approaches for LWRs consider Core Damage Frequency and Large Early Release

Risk-Informed Safety Classifications

“RISC-1” SSCs Safety-Related Safety Significant	“RISC-2” SSCs Nonsafety-Related Safety Significant
“RISC-3” SSCs Safety-Related Low Safety Significant	“RISC-4” SSCs Nonsafety-Related Low Safety Significant

Categorization & Classification

- Paradigm shift in advanced reactor safety basis from traditional nuclear reactors
- Categorization processes developed, and some endorsed, that recognize this paradigm shift

SSC Categorization Process
(e.g., NEI 18-04)

Identify SSC Safety
Classifications (e.g., RISC-3,
NSRST)

Select Applicable Codes and
Standards (e.g., Section III,
Section VIII, B31.1)

Select Code Classifications
(e.g., Class A)

Categorization & Classification

- Paradigm shift in

SSC Categorization Process
(e.g., NEI 18-04)

advanced reactor safety
base
nu

- Ca
de
en
thi

Nuclear Codes and Standards do not yet fully
recognize advancements in categorization and
classification of systems, structures, and
components

(e.g., Class A)

Selection of Construction Codes

- Current available options to construct items with a minimal contribution to safety or risk:
 1. Construct to requirements of Section III
 2. Construct to industrial codes and as necessary, apply additional requirements

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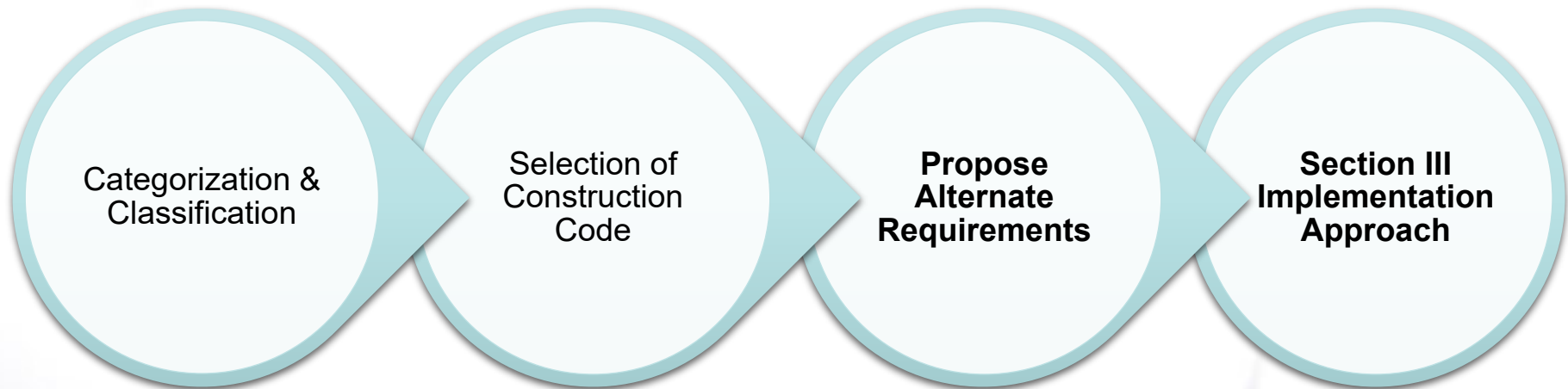
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Proposed Changes



Proposed Alternate Requirements

- Provide a new construction **option** commensurate with an item's contribution to safety and risk via alternative requirements within Section III that:
 - ✓ Uses design rules developed specifically for nuclear applications
 - ✓ Aligns Section III construction requirements with typical industrial codes

Technical Basis:

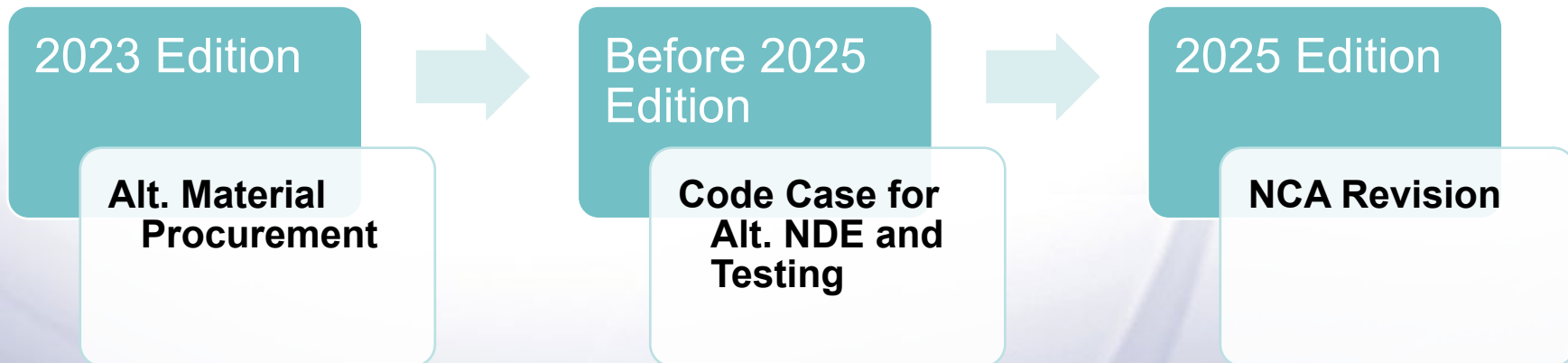
- Nuclear design rules are already used in nuclear applications
- Construction of low safety significant items to industrial code requirements is already permitted (e.g., 10CFR50.69)

Proposed Alternate Requirements

- Materials, Fabrication, and Examination Requirements
 - Code revisions for alternate material procurement
 - Code Case to permit alternate methods for NDE and testing
- Quality Requirements
 - Subsection NCA revision for alternate quality requirements

Implementation Approach

- Materials, Fabrication, and Examination Requirements
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Alternate Material Procurement

- Alternate requirements for material procurement of items commensurate with their contribution to safety or risk
 - Modeled after ‘small parts exemption’
- Permitted for all Classes in Division 5
 - Changes to Division 5 Subsections HBA and HBB, not Subsection NB
 - Changes to referenced Division 1 Subsections NCD, NE, NG and NF
- C&S Connect Record 22-979
 - *To see the evolution from the alternate requirements presented in the initial Code Case, see background file in Record 21-1257*

Record 22-979 - Revisions to NCA/HAA-3812 and HBA/HBB/NCD/NE/NF/NG-2610

NCA-3800 METALLIC MATERIAL ORGANIZATION'S QUALITY SYSTEM PROGRAM

NCA-3810 SCOPE AND APPLICABILITY (21)

The requirements of ~~NCA-3800~~ provide for various entities known as Certificate Holders, Material Organizations (~~NCA-3820~~), and approved suppliers (~~NCA-4255.3~~). These entities are involved in the performance of operations, processes, and services related to the procurement and furnishing of material, source material, and unqualified source material as defined in the Glossary (~~NCA-9200~~).

NCA-3811 Limitations

The following limitations apply to approved suppliers:

- (a) approved suppliers shall not approve other suppliers of materials or services that affect materials
- (b) approved suppliers may adopt a limited scope quality system program as approved by the Certificate Holder or Material Organization [~~NCA-4255.3(b)~~]

NCA-3812 Exclusions (21)

Material falling within the ~~small products exclusion~~ of NB/NCD/NE/NF/NG-2610 or material that is allowed by this Section to be furnished with a Certificate of Compliance, is exempted from the requirements of ~~NCA-3800~~, except

- (a) Certified Material Test Reports or Certificates of Compliance shall meet the requirements of ~~NCA-3862.1~~
- (b) for Class 1 construction only, material identification and marking shall meet the requirements of ~~NCA-4256.3~~

z. Add: for materials used in items commensurate with their contribution to safety or risk, as defined in (d) below, the requirements of NCA-3800.

(b) The requirements of ~~NCA-3862~~ shall be met as required by ~~NCD-2130~~. The other requirements of ~~NCA-3800~~ and ~~NCA-4200~~ need not be used by Material Organizations for small products, as defined in (c) below, for brazing material, and for material which is allowed by this Subsection to be furnished with a Certificate of Compliance. For these products, the Certificate Holder's Quality Assurance Program (~~NCA-4100~~) shall include measures to provide assurance that the material is furnished in accordance with the material specification and with the applicable requirements of this Subsection.

(c) For the purpose of this paragraph, small products are defined as given in (1) through (4) below:

- (1) pipe, tube (except heat exchanger tube), pipe fittings, and flanges NPS 2 (DN 50) and less;
- (2) bolting materials, including studs, nuts, and bolts of 1 in. (25 mm) nominal diameter and less;
- (3) bars with a nominal cross-sectional area of 1 in.² (650 mm²) and less;
- (4) material for pumps and valves with inlet pipe connections of NPS 2 (DN 50) and less;
- (5) materials exempted by ~~NCD-2121(c)~~.

Record 22-979 - Revisions to NCA/HAA-3812 and HBA/HBB/NCD/NE/NF/NG-2610

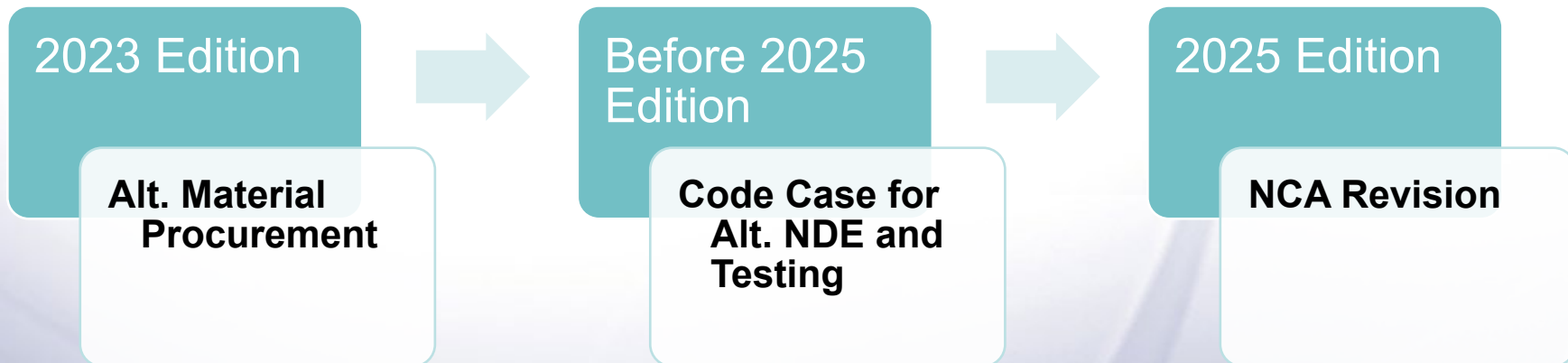
Add: (d) For the purpose of this paragraph, items commensurate with their contribution to safety or risk are defined as given in (1) and (2) below:

(1) The Owner or their designee has established that the exemption is consistent with the safety or risk significance of the item. The determination of the safety or risk significance of the item to design and operations is beyond the scope of this Section. Appropriate guidance for the safety or risk significance of the item shall be derived from system criteria documents for specific types of nuclear power systems and may be found in the requirements of regulatory and enforcement authorities having jurisdiction at the site.

(2) The Owner or their designee has permitted the exemption in the Design Specification and shall specify to which items this exemption applies.

Implementation Approach

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Future Section III Engagement

Alternate Requirements Commensurate with an Item's Contribution to Safety and Risk

Code Case on Class 2/3 Small Piping Alternate Requirements

Ultrasonic Examinations during Construction

Updates to Seismic Rules

Nuclear Technical Bulletin 5

Regulatory Strategy and Options

- Reason for a Regulatory Strategy
 - Unique approaches
 - Stakeholder needs
 - Broader and more frequent engagement
- Strategy
 - NRC Drop-in's
 - Public Meetings including AR Stakeholder Meetings
 - White papers
 - Draft Code Changes
- Explore various available regulatory options
 - Most efficient endorsement avenue

Q&A and Next Steps