Closing the Gaps for Deploying New Nuclear

An Overview



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Advanced Nuclear Technology (ANT) Program Focus

MISSION: Accelerating the deployment of nuclear power around the world

- **Informing Resource Planning**
- **Technology Development**
- **Reducing Deployment Costs**
- **Supporting Plant Startup**



- More than +100 companies
- 300+ Past Products
- Dozens of Ongoing Projects

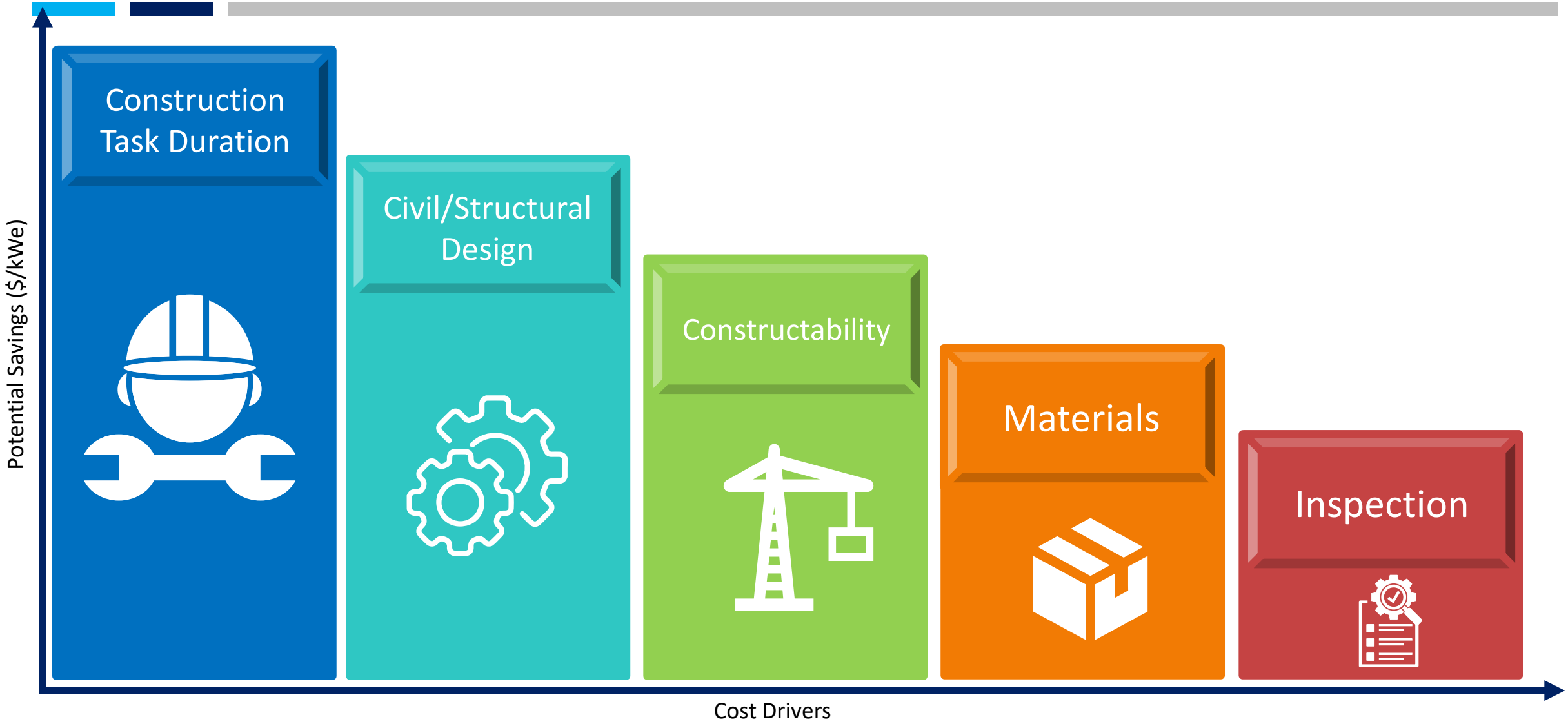
From project initiation through initial operation,

ANT is an extension of your team.

VISIT ANT.EPRI.COM

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What Drives Nuclear Costs



Project Execution and Planning are Critical for Project Success!

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Construction and Commissioning Priorities – Advanced Reactors Roadmap



- **Nuclear Construction Culture**
  - Right-sized approaches for nuclear construction activities
  - Review processes to eliminate unnecessary or burdensome work that add little of no value to the project
- **Advanced Construction Technologies and Standardization**
  - Develop, enable and utilize new construction technologies
  - Perform construction demonstrations and tests to accelerate their deployment
- **Nuclear Construction Experience**
  - Compile construction guidelines that contain information on adequate division of responsibilities

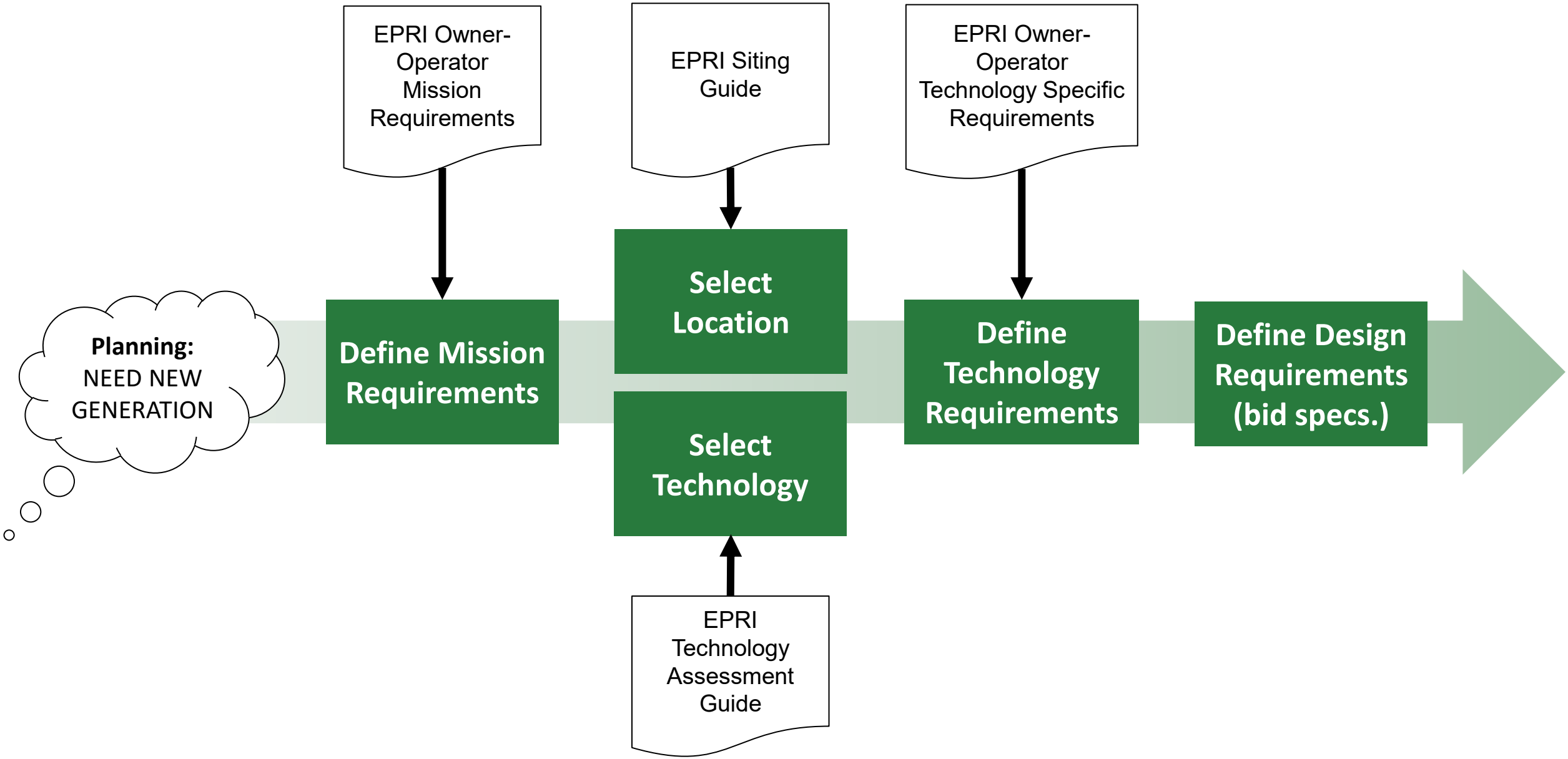


Industry's roadmap to the future fleet

ARRoadmap.com

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Project Development and Execution Guidance



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Project Execution Guides on EPRI.com

Comprehensive guides covering the full nuclear project life to ensure successful execution!

Project Planning

Defining scope, schedule, budget, risks, and overall execution strategy for the project.

Procurement

Sourcing and purchasing materials, equipment, and services needed for the project.

Engineering & Design

Creating technical designs and specifications that define how the project will be built.

O&M Preparation

Planning how a facility will be operated and maintained after construction, including staffing, procedures, and maintenance plans.

Construction

Physically building and installing all project components on-site.

Commissioning

Testing and verifying systems to ensure they work correctly before operation.

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Modular Applications in New Nuclear Builds

Electrical Modules

(sensors, power supplies, signal processors)



(courtesy of KHS&S Contractors)

Mechanical Modules

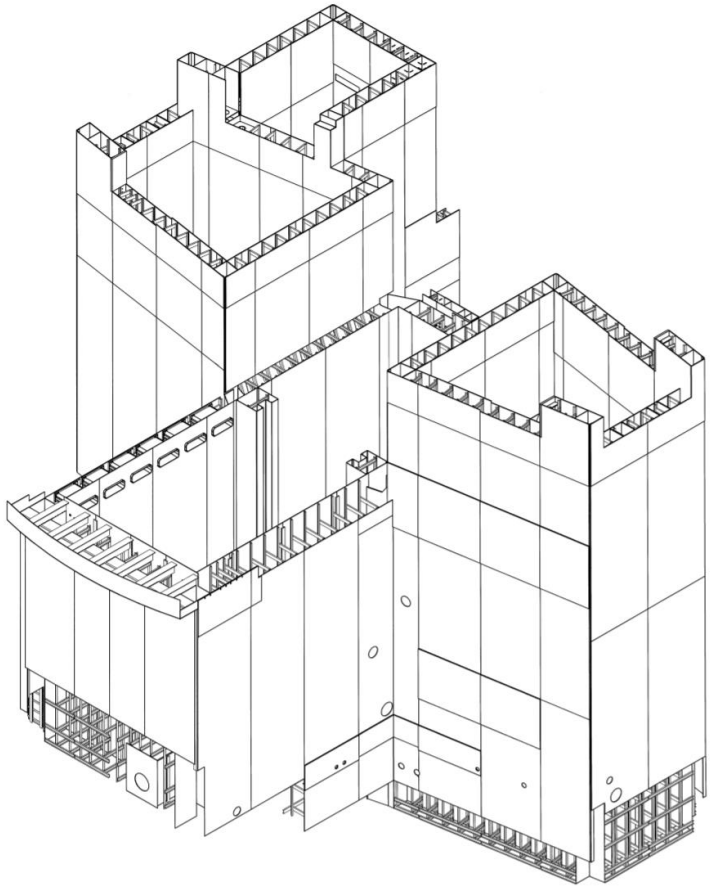
(piping, tanks, valves, strainers, orifices)



(courtesy of MEP Solutions)

Structural Modules

(steel-plate composite construction, structural steel, rebar cages/mats)



(AP1000 DCD, ©Westinghouse Electric Company, LC)

Structural Steel



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Typical Quality and Inspections Items - 1021178

Factory testing should be performed to the same requirements that would be used at the site

- Shape, size, dimensions, spacings
- Support locations and defects
- Pipe weld
- Connections, bolts, and fit-ups
- Studs and tie rods welding
- Cleanliness check
- Hydrostatic testing
- Flushes
- Component testing
- Electrical checks
- Instrumentation checks
- System testing



Research shows that digital documentation of quality records improves efficiencies

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Importance of Large-Scale Testing – 3002026496

Example: Study lap splice strength of large steel bars for use in nuclear application to reduce reinforcement congestions

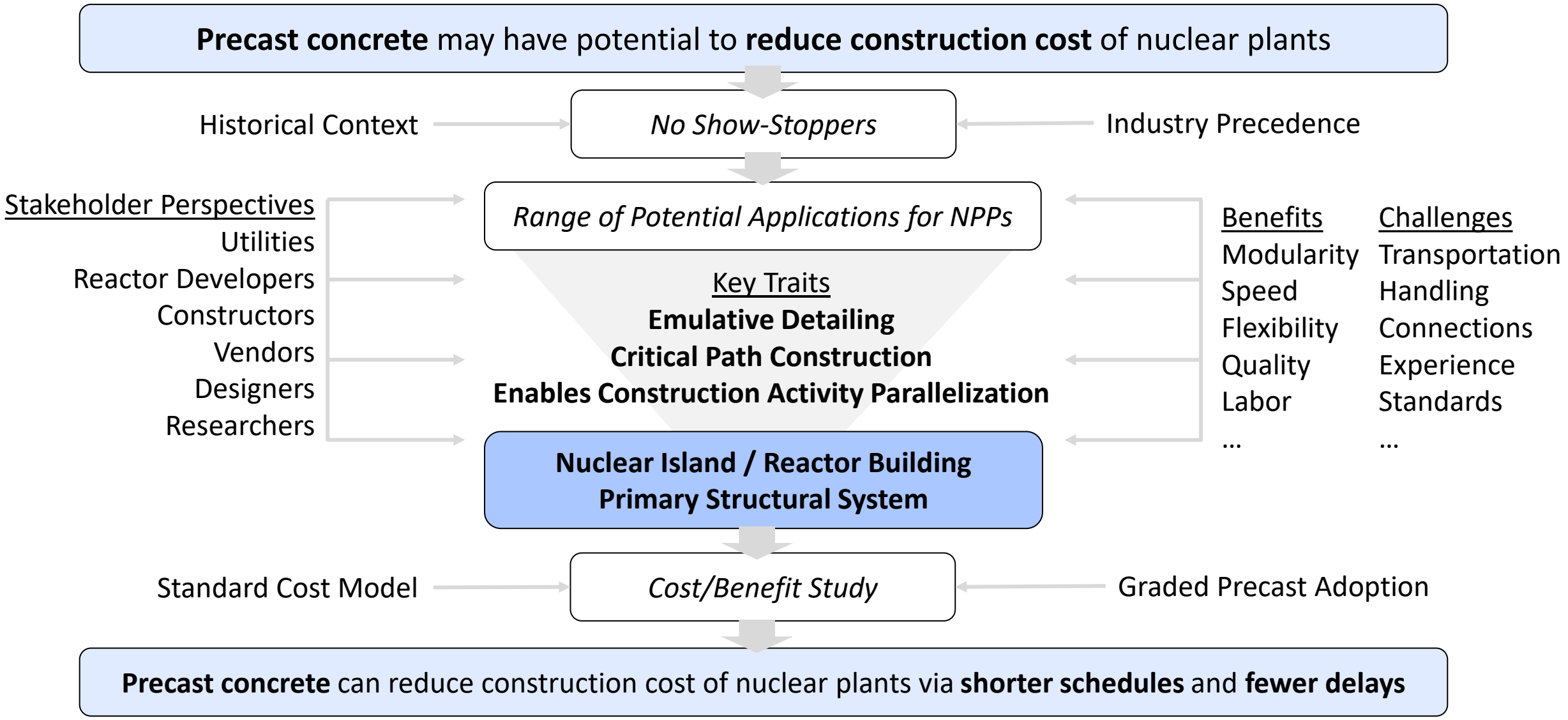






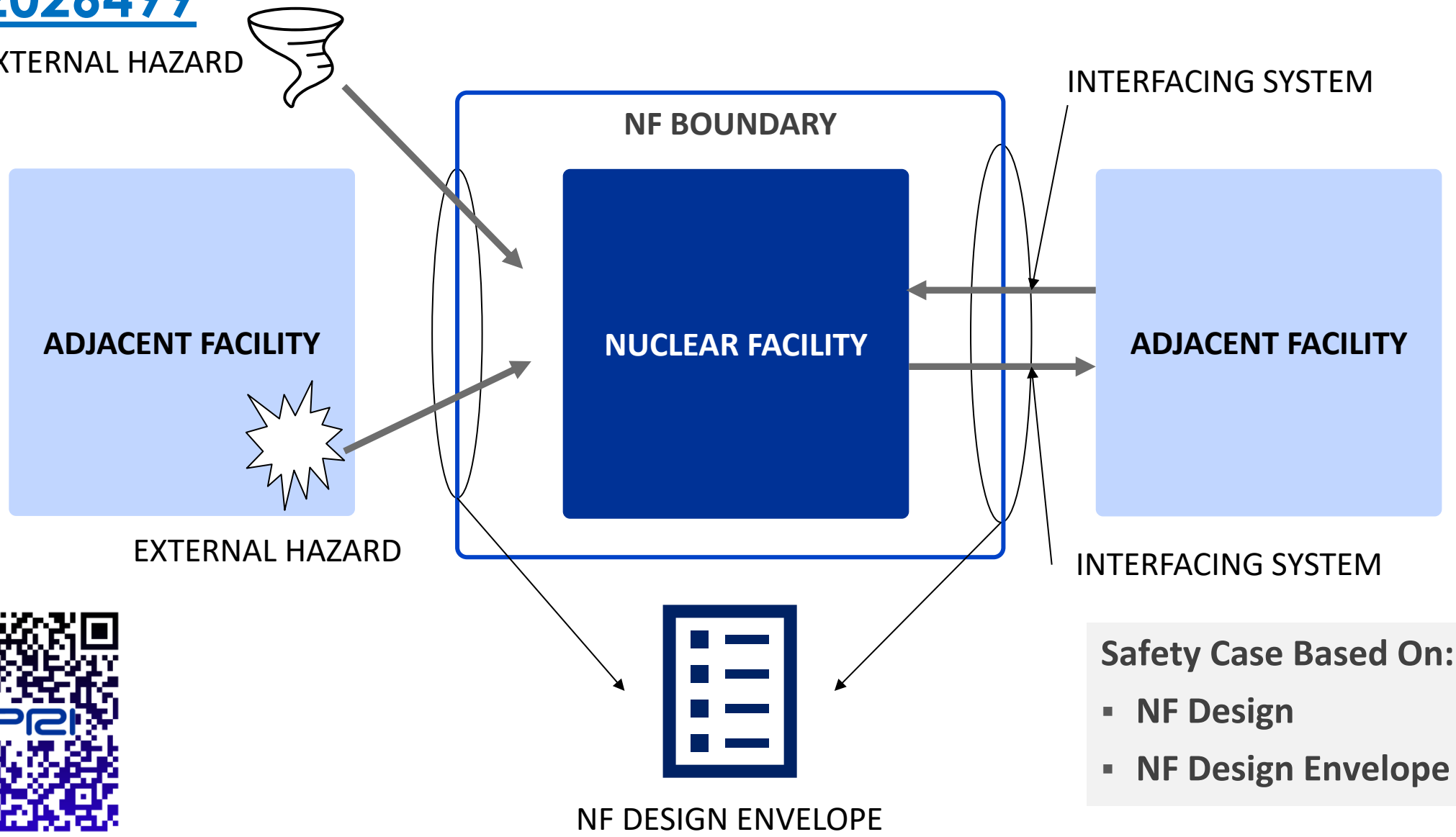
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Evaluation of Precast Concrete Construction for New Reactor



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Separation of Nuclear Facilities from Adjacent Facilities – 3002026499



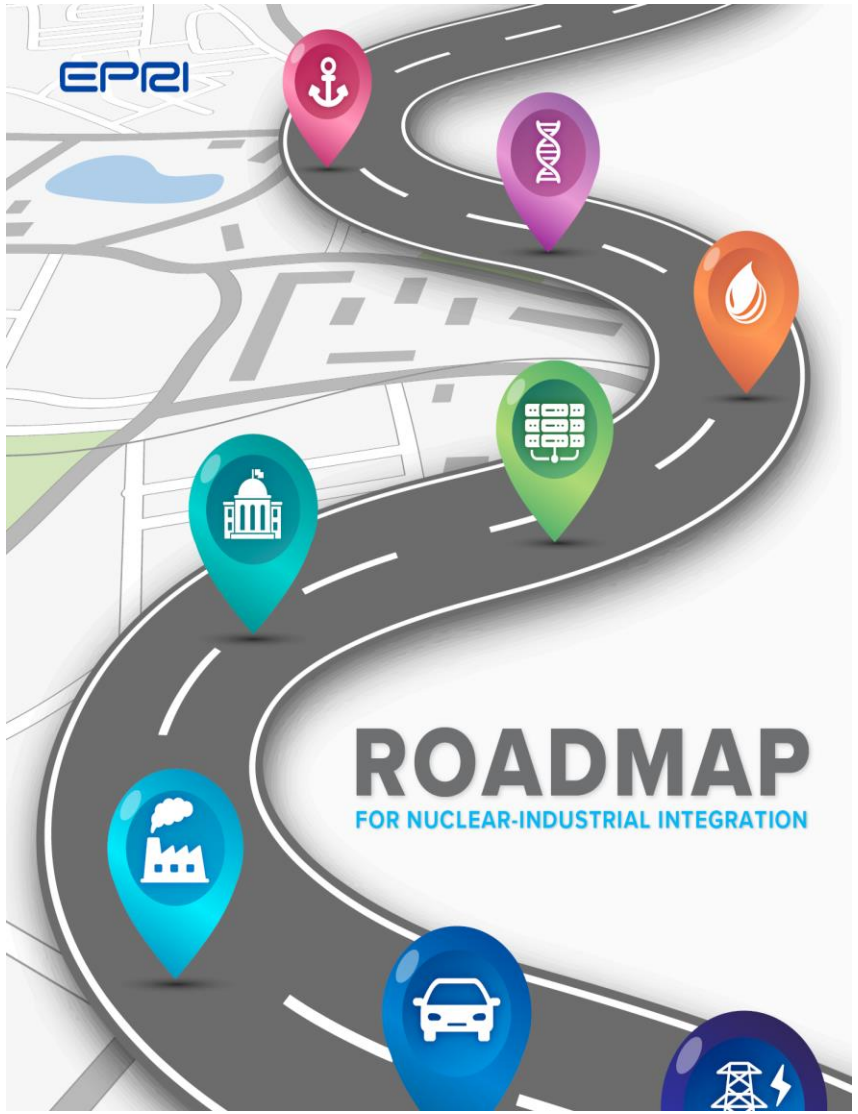
Safety Case Based On:

- **NF Design**
- **NF Design Envelope**

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Nonelectric Mission Roadmap (3002032210)

- Technical 01
- Operational 02
- Financial 03
- Ownership 04
- Policy / Regulatory 05
- Permitting 06
- Project Development & Execution 07
- Security 08
- Public Awareness 09
- Insurance 10



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New Plant Technical Assistance

Direct Technical Assistance

Provides **structured technical assistance** for new nuclear projects across the lifecycle

Customized Engagement

Delivers **member-specific engagement** through workshops, site visits, and guidance aligned to project maturity and goals

All ANT Capabilities

Integrates **ANT capabilities** (development, siting, technology selection, licensing, execution readiness) into one interface

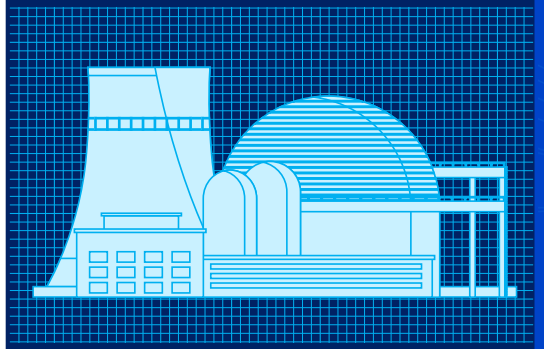
Risk Reduction

Supports **early decisions and risk reduction** using lessons from recent nuclear projects

Member Confidence

Strengthens **readiness** for licensing, procurement, and construction

EPRI Technology Transfer



Project Initiation

New to Nuclear Training

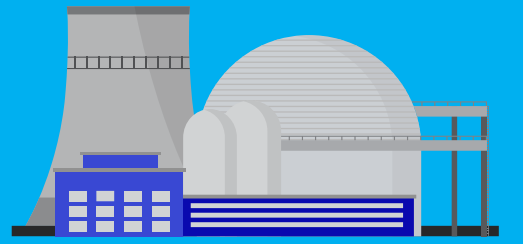
- ✓ Siting
- ✓ Utility and Owner Requirements
- ✓ Design



Pre-Construction

Construction Readiness Review

- ✓ Engineering
- ✓ Optimization
- ✓ Advanced Manufacturing



Commissioning and Initial Operations

Technical Readiness Review

- ✓ EPRI Program Implementation
- ✓ Startup and Testing

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