

EPRI's Advanced Construction Research

Enabling the deployment of Advanced Reactors

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Engineering and Construction Innovation

GOAL
& VALUE

Identify, develop, qualify engineering and construction technologies that enable:

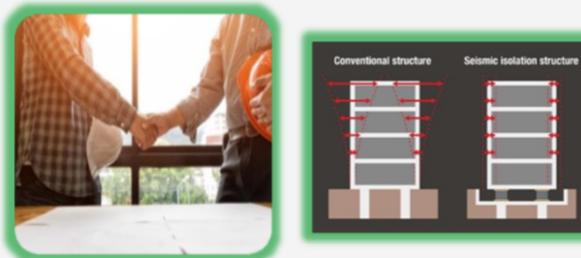
Reduced Cost | Increased Quality | Improved Efficiency



- Modular Construction Technologies
- Structural Health Monitoring
- Digital Twin Applications

Construction Technologies

- Risk-Informed Performance-based Design Solutions
- Steel-plate Composite (SC) Structures Analysis Guide
- Analysis of Structures, Systems and Components



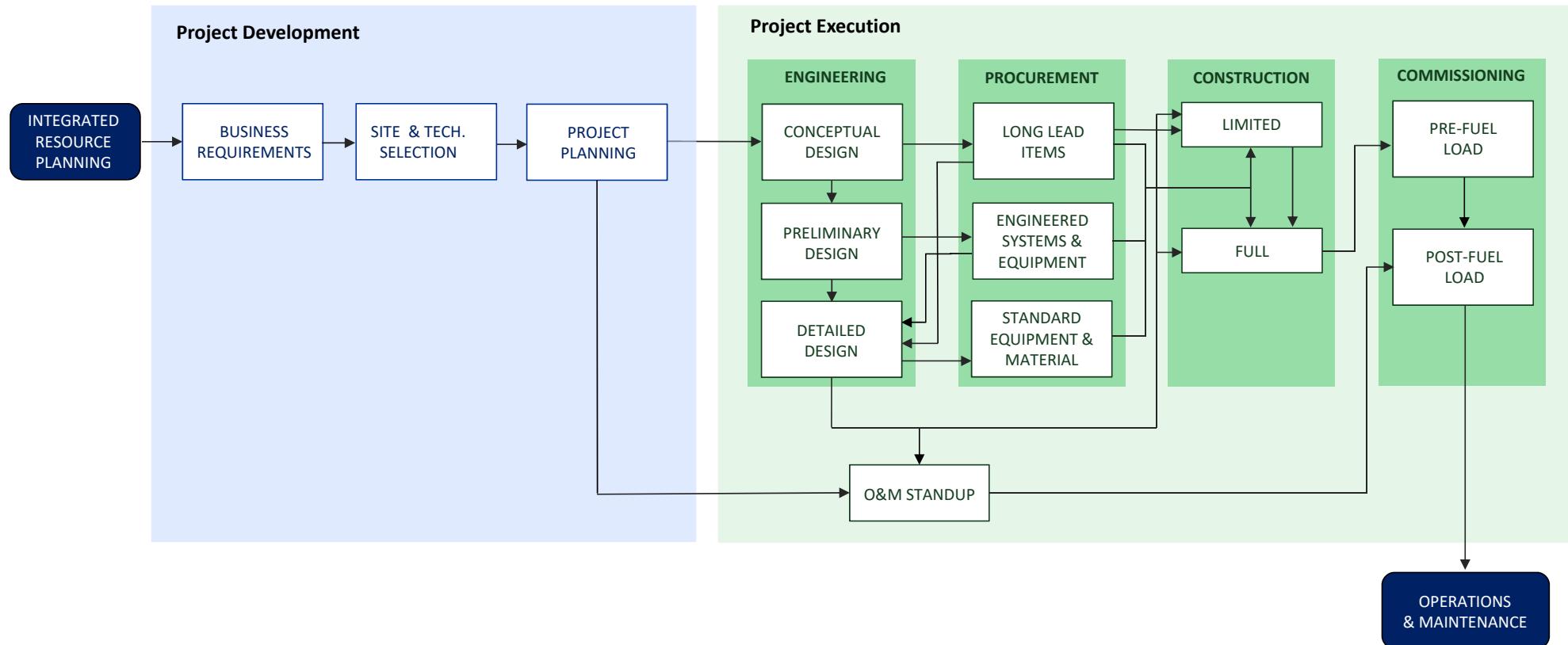
Engineering Solutions



- Assessing Concrete Behavior under Elevated Temperatures
- Testing high-strength Large Steel Rebars for applications
- Self-consolidating Concrete for Mass Construction Applications

Concrete and High Strength Rebars

Project Development and Execution Lifecycle



Shifting Paradigms for the Future Fleet

Innovative Construction Processes

- Seismic Base Isolation
- Digital Twins
- Faster construction disposition
- Modularization



Autonomous Advanced Reactor

- Optimize **staff** while improving **safety** and **reliability**
- Leverage **sensors, drones**, and **robotics**



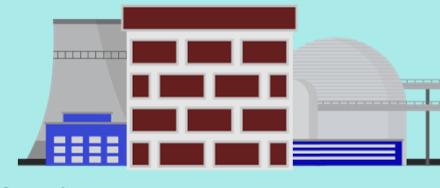
Reinventing the Nuclear Supply Chain



- Commercialize advanced manufacturing techniques
- Reduce long-lead procurement times by **up to 90%**
- **Develop code cases** to allow for industry application

Separation of NF & AF

Develop a methodology to **decouple nuclear facility** from adjacent facilities



- Improve **economics**
- **Enables** non-electric missions
- Simplifies **licensing** reviews

Large-Scale Testing

PHASE 1 (COMPLETE)

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



PHASE 2

Explore mechanical splices of high-strength steel bars

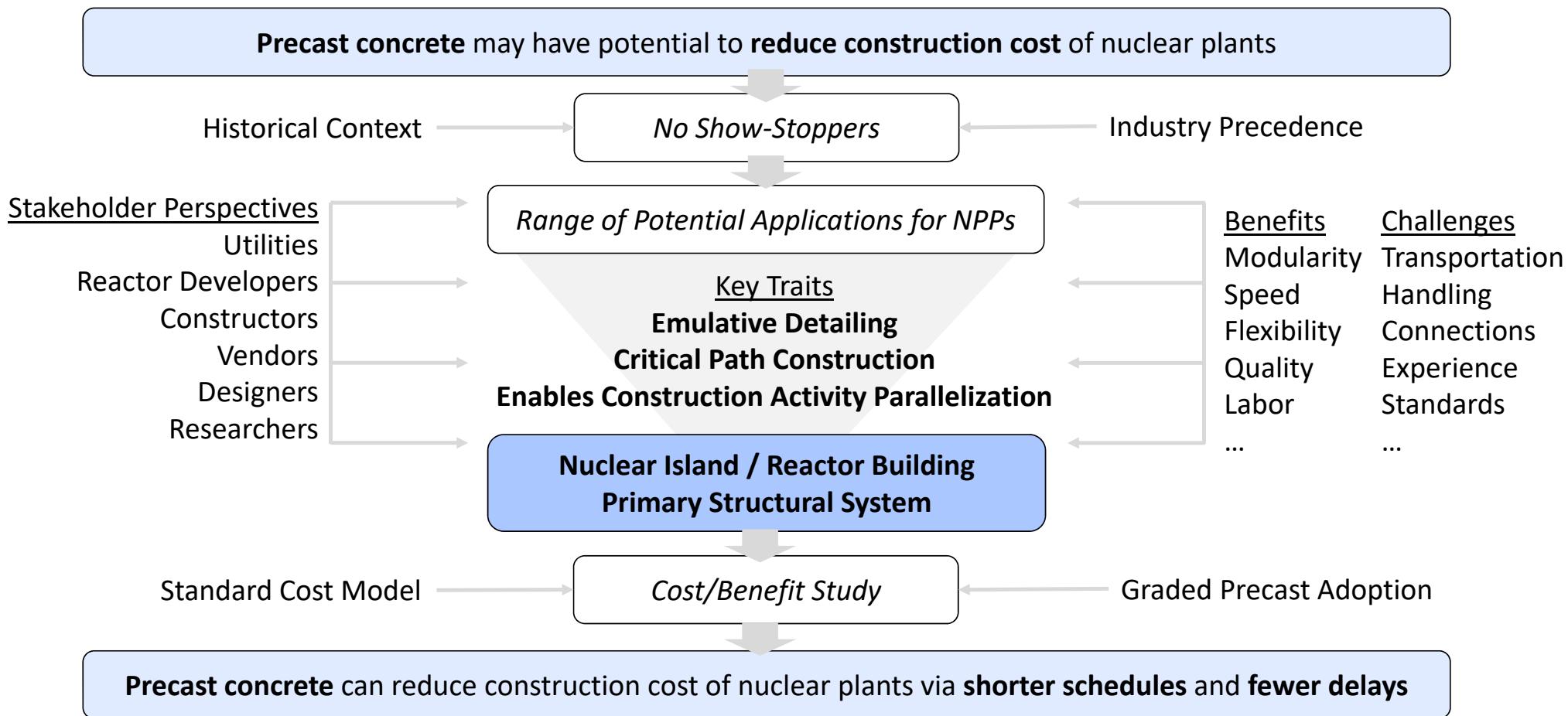


PHASE 3

Experiment earthquake-resistant anchorage design



Evaluation of Precast Concrete Construction for New Reactors



Accelerating Construction Schedule

- Streamlining Construction Evaluations (SCE) for dispositioning construction nonconformances [3002023903](#)
- Risk informing construction inspections
- Strategies for efficient and skilled labor
- Large demonstration projects of critical construction activities
 - Field welding/Fit-up/Fabrication of modules
 - Underground construction





Together...Shaping the Future of Energy®