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Advanced Construction Technology Initiative Program: ACTI Phase 1 ACTI Phase 2

March 2024

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Changing the World's Energy Future

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NRIC National Reactor Innovation Center

Advanced Construction Technology Initiative Program

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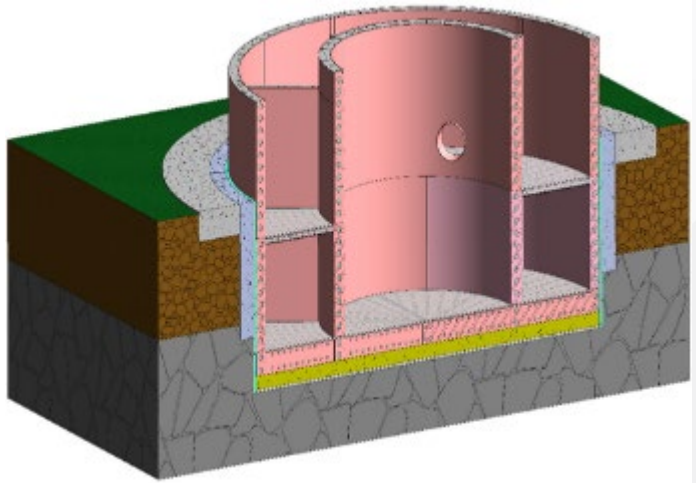


ACTI Program Scope

- Demonstrate technologies to significantly reduce the cost and schedule for construction of advanced reactors.
- Demonstrate the technology by 2026/2027 to improve the economics of deploying advanced reactors.
- Selected technologies will not require major R&D efforts. With prototyping and testing, the technologies will be ready for deployment at scale.

Benefits of Demonstration & Testing

- Bridge the gap between development and commercialization
  - Mature technology readiness and reduce risks to participants for first of a kind build
  - Facilitate partnership between technology developers, end users, national labs, universities, regulators, industrial participants
- Learn by doing reduces risks associated with first commercial build
- Build confidence with regulators
- Develop supply chain

Recap - ACTI Project with GEH

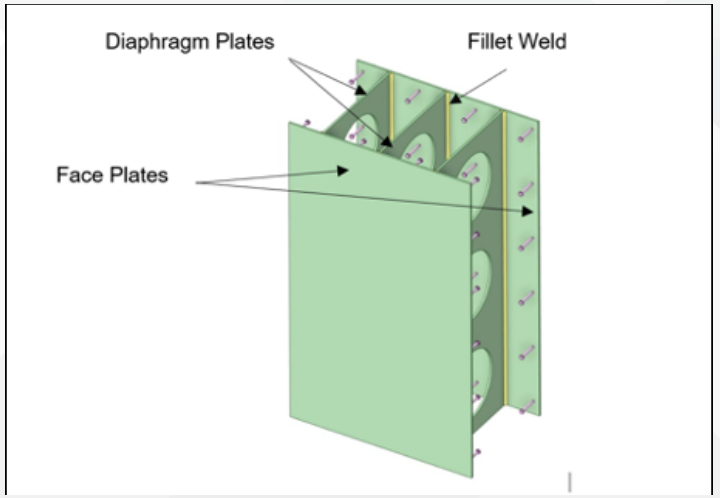
- Team - General Electric Hitachi
  - EPRI, Black & Veatch, Purdue, UNCC, Aecon Wachs, and Tennessee Valley Authority
- Purpose - demonstrate technologies to:
  - Reduce the cost of new nuclear builds
  - Speed the pace of advanced nuclear deployment
- Phase 1:
  - Build & test Steel Bricks™ specimens at Purdue
  - Design a reactor building demonstration
  - Develop advanced monitoring and digital twin technologies

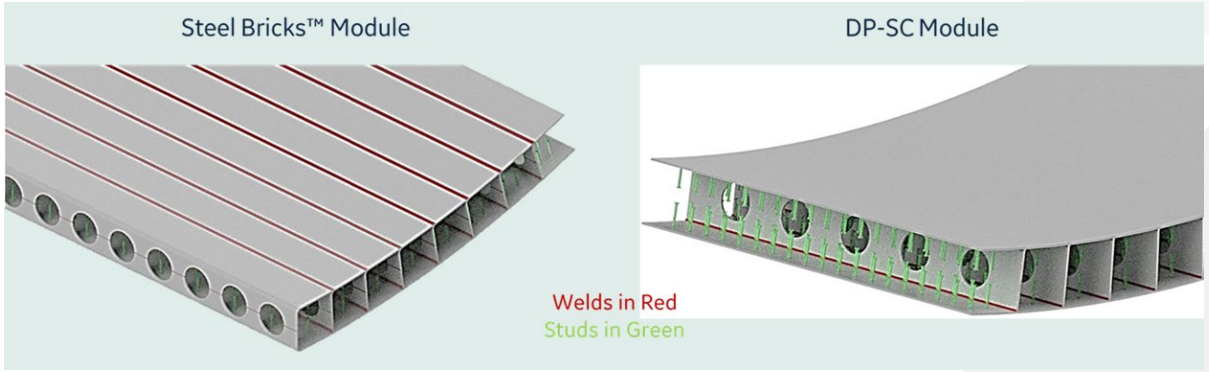
Recap - ACTI Project Accomplishments

- Demonstrated concept of fabricating Steel Bricks™ assemblies in a factory setting
- Successfully tested Steel Bricks™ specimens at Purdue
- Established digital twin and monitoring techniques
- Demonstrated NDE methods to inspect concrete inside Steel Bricks™

Design Pivot

- Design Pivot to Diaphragm Plate Steel Composite (DPSC):
  - From lessons learned in Phase I, GEH determined that DPSC are a better solution for the ACTI Project
  - Benefits over Steel Bricks™
    - Major reduction in weld volume and inspection
    - Faster to fabricate
    - Does not require post-forming heat treatment
    - Simplified fit-up
    - More cost effective





Current Project Status

- Extended Phase 1 to Q4 FY24
- Phase 1 Completion:
  - Fabricate and test DPSC specimens
  - Design Phase 2 demonstration using DPSC
  - Propose Phase 2 demonstration project with DPSC
- Potential Phase 2 scope may include:
  - Build and test structure using DPSC
  - Disassemble and decommission

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