

Adam Owens, Moltex Energy

RECC: Rigid Elastic Composite Civilworks

Team members

- Argonne National Laboratory
- Oak Ridge National Laboratory
- Electric Power Research Institute
- Purdue University

Goal

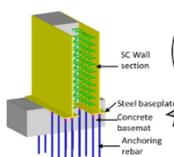
- Demonstrate that Advanced Nuclear deployment can be transformed using contemporary construction technology.
- Develop the evidence required to achieve licensing-readiness of these technologies

What is the technology?

- RECC technolog(ies) are construction techniques that deliver structural performance (seismic, impact) with significant cost/time savings
- Our design philosophy attacks the 4 fundamental obstacles in the critical path:
 - Design
 - Form
 - Install
 - Reinforce

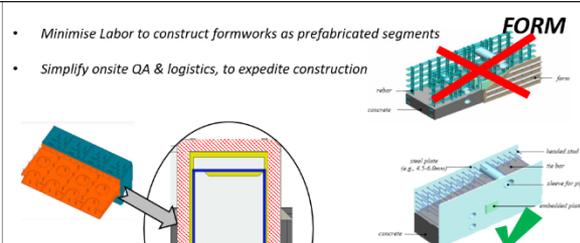
DESIGN

- Connections which are common throughout, no custom engineering
- No time spent validating custom rebar designs for regulators
- BIM – Design Automation enabled



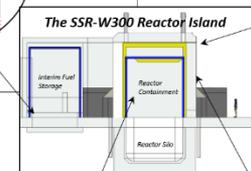
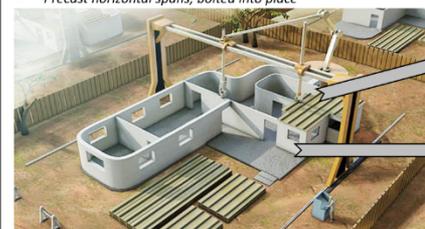
FORM

- Minimise Labor to construct formworks as prefabricated segments
- Simplify onsite QA & logistics, to expedite construction



INSTALL

- Automated pouring – Inspired by 3D additive printing
- Precast horizontal spans, bolted into place

REINFORCE

- Add fibrous polymer coatings or grouts for additional flexural strength (seismic, small missile impacts)
- Customisable solution, can adapt to different reactor designs
- Provides additional innovative functions, including waterproofing



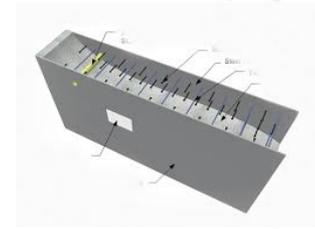
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How is your system transformational?

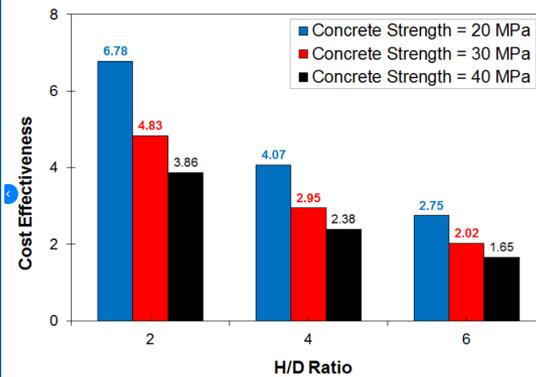
- CCGT can be deployed in 24m. Rapid construction can make advanced nuclear the **natural replacement**.
- Overnight CAPEX: targeting a \$0.25Bn opportunity from critical path reduction/simplifying qualification.
- Rigid Elastic Composite Technologies (spray coatings, composite grouts/aggregates, composite-integrated formworks) have demonstrated prospects in other industries (see right).
- The move to contemporary structural design is an enabler for:
 - Simpler construction QA
 - Simpler Install/forming
 - Simpler/generic site design

“Steel Core System Revolutionizes High-Rise Construction”



The technologies have already been transformational in other industries...

Can we achieve the same for Nuclear?



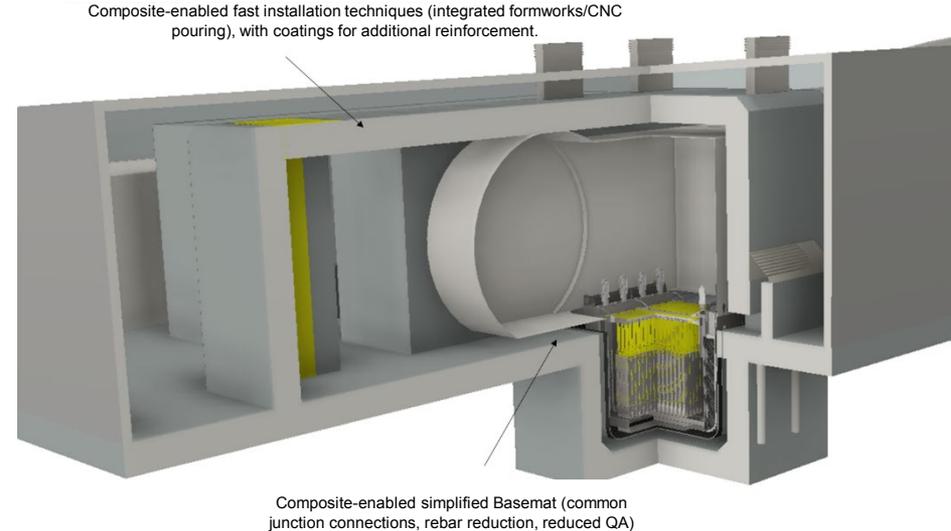
“earthquake-resistant concrete half of the cost of standard (solutions)”

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What challenges do you anticipate?

- *How do we make a safety case?*
 - *Rigorously identify “new” PIEs and failure modes*
 - *Be able to demonstrate consequences in terms of Reactor Performance*
 - *Be able to quantify hazards arising from these consequences*
- *The technology options are actually relatively-mature. The application of them to a nuclear licensing regime needs development of a considered approach.*
- *It's the technology that needs to be done first! Construction efficiency is pivotal to FOAK timing. Other reactor developments can come after...*



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Thank you

Q&A

