

# **CNSC - U.S. NRC Cooperation on Advanced Reactor Technologies and Small Modular Reactors**

January 11, 2023

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# Outline

- Introduction
- Memorandum of Cooperation process
- First products
- Current work
- Future projects

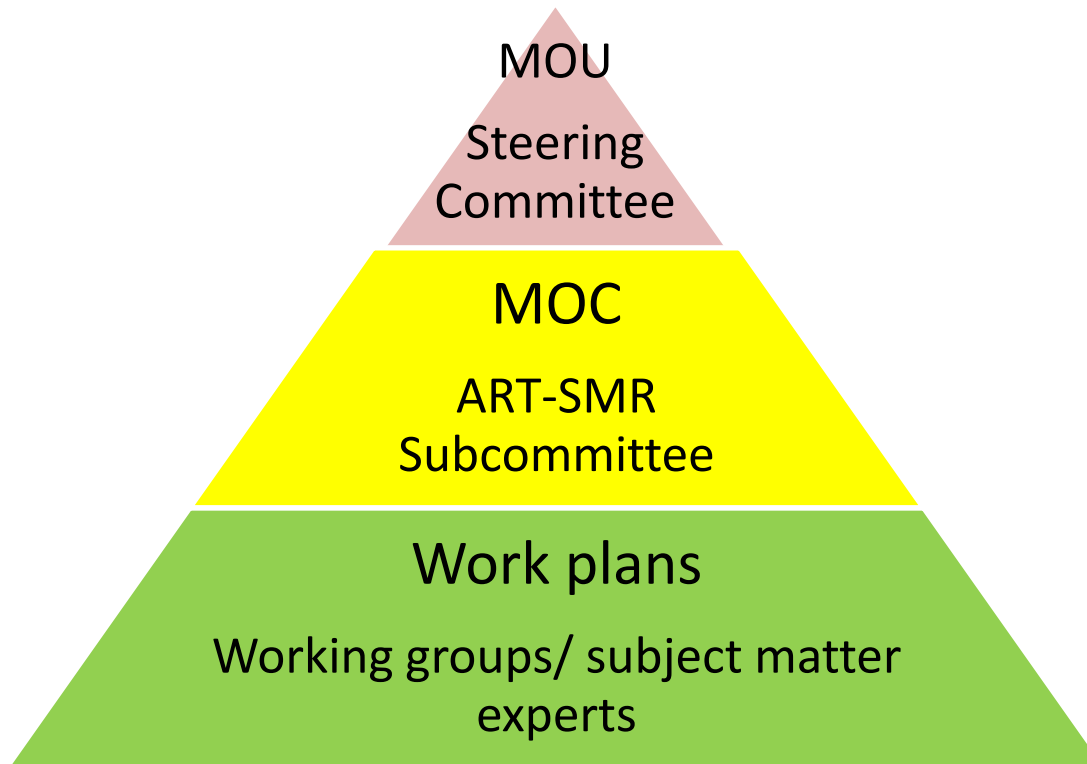


# Introduction

- Memorandum of Cooperation signed in 2019 to collaborate on reviews of designs submitted for review in the U.S. and Canada
- Goal - Collaborate on ART-SMR design reviews and share experience
- Benefits to CNSC and USNRC
  - Effective and efficient regulation
  - Risk-informed agile decision-making



# Implementation of the MOC



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# Scope of Memorandum of Cooperation (MOC)

## Scope of projects

- Pre-licensing engagement
- Licensing reviews
- Science and research

## Development of work plans

## Processes for collaboration



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# Joint NRC/CNSC Products

## Pre-licensing Engagement

- X-energy – Xe100 reactor pressure vessel construction code assessment
  - GEH- BWRX-300 Containment Evaluation Method
    - Terrestrial - postulated initiating events

## Review Approaches

- Report Comparing the U.S. LMP with the Canadian Approach

## Unique Technical Considerations

- TRISO fuel qualification



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# Lessons Learned and Improvements to the Collaboration Process



Expansion to include UK/ONR



Staff exchanges



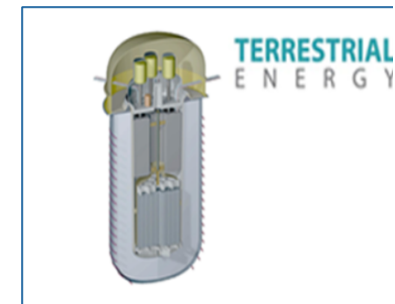
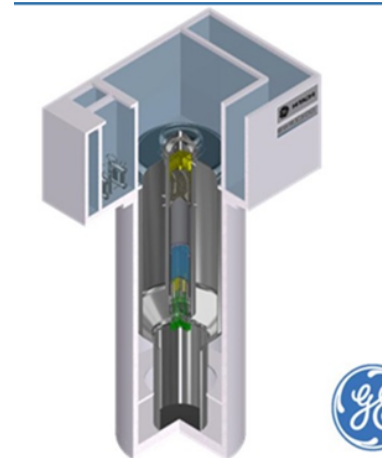
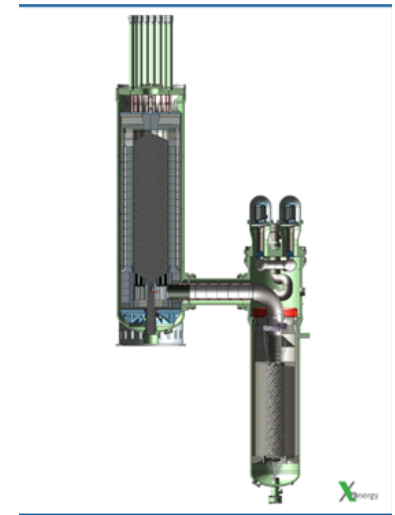
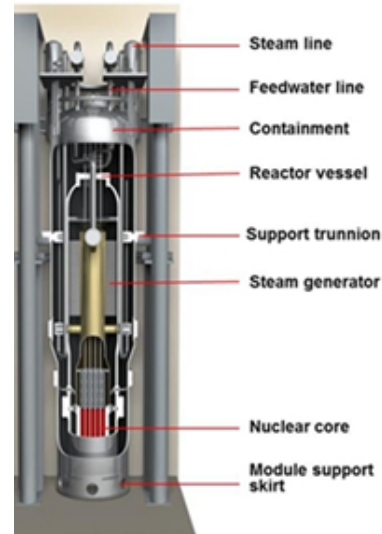
Strengthened communication to external stakeholders



Upgrades to collaboration tools

# Project Selection

- Request by vendors
- Criteria
  - The extent to which the vendor is engaging in meaningful pre-licensing activity with each regulator
  - The similarity between the vendor's engagement activities in each country
  - The timelines for engaging with each regulator
  - The ability of the vendor to share information about their design with both regulators



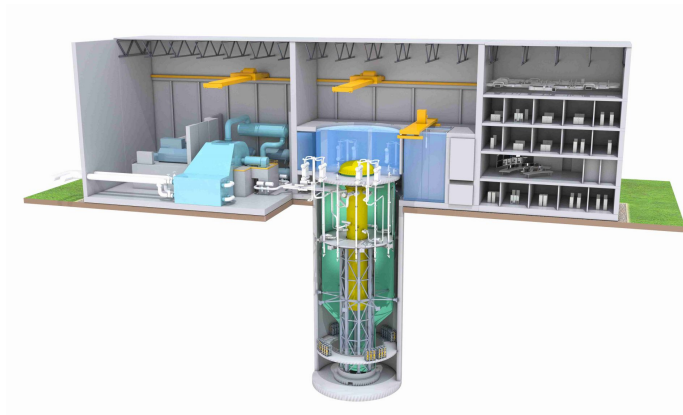


# Current Work

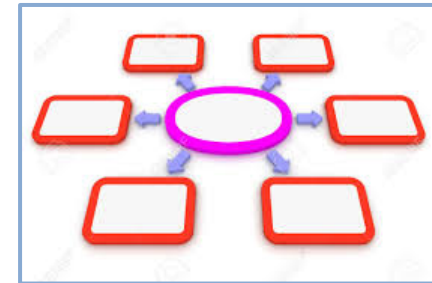
Collaborative work plans underway



TRISO Fuel  
Qualification



GEH BWRX-300



Safety Classification  
of Structures,  
Systems and  
Components

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# Joint Review of GE Hitachi's BWRX-300

- TVA, OPG, SaskPower independently selected the same technology (GE Hitachi's BWRX-300 design)
- NRC and CNSC are conducting collaborative reviews on specific technical topics Under the MOC
- Goal: Efficient and coordinated reviews resulting in common technical positions
- To date, NRC and CNSC have successfully collaborated and issued a joint report on BWRX-300 containment evaluation method.



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# CNSC-NRC MOC BWRX-300 Current Projects

- BWRX-300: Advanced construction techniques. The NRC and CNSC staff are reviewing a white paper on BWRX-300 Steel-Plate Composite (SC) Containment Vessel (SCCV) and Reactor Building Structural Design
- BWRX-300: Safety Strategy. The NRC and CNSC staff are reviewing a white paper on the Safety Strategy for BWRX-300. The Safety Strategy incorporates selected guidance from the IAEA Safety Standards Specific Safety Requirements No. SSR-2/1, Revision 1, “Safety of Nuclear Power Plants: Design.”
- BWRX-300: fuel verification and validation. CNSC is leveraging previous USNRC reviews of the GNF2 fuel product in the CNSC’s review of OPG’s construction license application.



# Next Steps

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- Work with vendors and utilities to identify specific technical issues and perform joint reviews of topical reports and white papers in the pre-application phase
- Cooperate on the review of specific sections or topics in licensing applications.

