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NAC-MPC/ NAC-UMS CoC Renewal Application Projects

First Pre-application Meeting

September 6, 2017

Agenda

- **Introductions**
- **NAC-MPC and NAC-UMS CoC Background**
- **Regulations, Guidance, and Precedence**
- **Overall Timeline for Projects**
- **Review of Work Completed**
  - System/Structure/Component Scoping Process
  - Aging Management Review Process (materials, operating environments, aging effects)
  - Pre-application Inspection 1
- **Review of Current Work**
  - Time Limited Aging Analyses Process
  - Aging Management Programs Process
  - Pre-Application Inspection 2 Preparations
- **Pre-Application Inspection-2018**
- **Review of Work Remaining**
- **Summary**

Introductions

- **Key NAC Project Team Members**
  - Wren Fowler, Director, Licensing
  - Gary Tjersland, Director, Cask Operations
  - Steve Sisley, Program Manager, Cask Development Projects
  - Eric Shewbridge, Project Manager
- **Key NAC Client Project Participants**
  - Paul Plante, Cask Relicensing Manager, Three Yankees
  - Neil Fales, Aging Management Programs Manager, Three Yankees
  - Cheryl Olson, Dairyland Power Cooperative
  - John Henkleman, Dairyland Power Cooperative
  - Steve Edwards, Duke Energy
  - Matt Keene, Duke Energy
  - Chris Long, Duke Energy
  - Luke McIntyre, Arizona Public Service

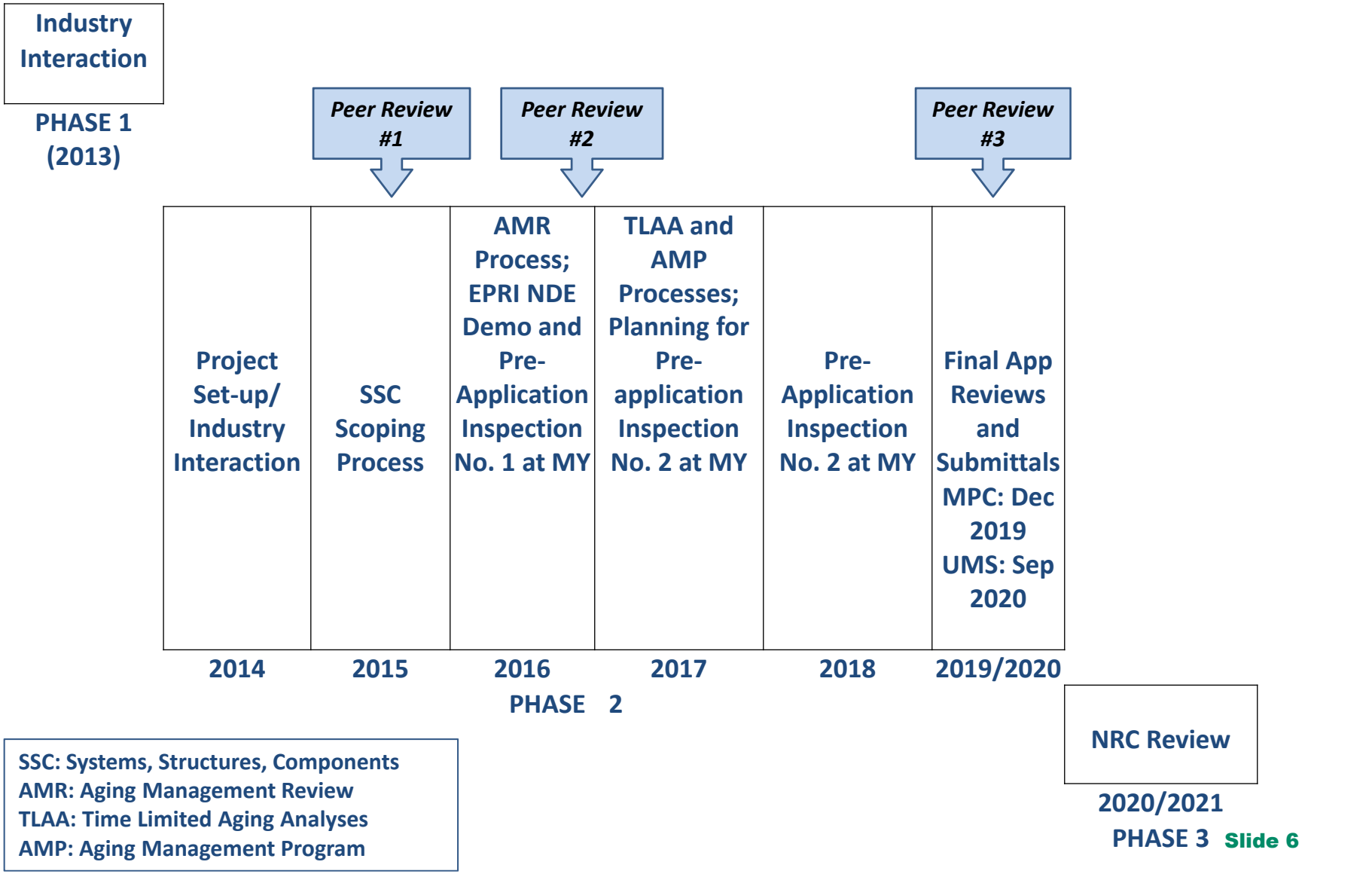
NAC-MPC and NAC-UMS CoC Background

- **NAC-MPC**
  - CoC granted April 2000 for initial 20 year term
  - 6 Amendments; Amendment 7 to be discussed later today
  - Requesting 40-year period of extended operation
  - Deadline for timely renewal: March 2020
  - Intend to submit by December 2019
  - Applicable Sites: Connecticut Yankee, Yankee Atomic, Dairyland LACBWR
- **NAC-UMS**
  - CoC granted November 2000 for initial 20 year term
  - 5 Amendments; Amendment 6 has been accepted for review
  - Requesting 40 year period of extended operation
  - Deadline for timely renewal: October 2020
  - Intend to submit by September 2020
  - Applicable Sites: Maine Yankee, Palo Verde (APS), McGuire (Duke), and Catawba (Duke)

Regulations, Guidance, and Precedence

- 10 CFR 72.42
- NUREG 1927, Revision 1
- NUREG XXXXX MAPS (Draft)
- NEI 14-03, Revision 2
- EPRI CISCC Susceptibility Assessment Criteria Report (Sept 2015)
- EPRI Aging Management Guideline (March 2017)
- ASME Section XI Code Case (Draft)
- VSC-24 CoC Renewal Application

NAC-MPC/NAC-UMS CoC Renewal Projects Timeline



SSC: Systems, Structures, Components
AMR: Aging Management Review
TLAA: Time Limited Aging Analyses
AMP: Aging Management Program

NAC-MPC/NAC-UMS CoC Renewal Projects Work Completed

- Conducted System/Structure/Component (SSC) Scoping Process for each system
- Conducted Aging Management Review Process (materials, operating environments, aging effects)
- Completed initial drafts of NAC-MPC/NAC-UMS CoC Renewal Application (RA) templates, Section 1 (General Information), Section 2 (Scoping Evaluation), and Section 3 (Aging Management Reviews)
- Completed the collection and recording of aging management data by the participating utilities
- Upgraded NAC OE database capability for receiving multi-page PDF files
- Supported Two Industry Peer Reviews by Industry Subject Matter Expert
- Participated in key industry meetings affecting CoC RA (NRC/NEI meetings regarding NUREG 1927 Rev 1 and NEI 14-03; NEI/INPO meetings regarding Aging Management INPO Database; ASME Section XI ISI meetings; EPRI ESCP meetings; EPRI NDE Pilots at Palo Verde, McGuire, and Maine Yankee)

NAC-MPC/NAC-UMS CoC Renewal Projects
SSC Scoping Results

SSC Description	Scoping Results		In-Scope SSC
	Criterion 1(1)	Criterion 2 (2)	
Transportable Storage Canister (TSC/Canister)	Yes	NA	Yes
Vertical Concrete Cask (VCC)	Yes	NA	Yes
Transfer Cask (TFR)	Yes	NA	Yes(7)
Spent Nuclear Fuel Assemblies(3)	Yes	NA	Yes
Fuel Transfer Equipment(4) and Ancillary Operating Equipment(5)	No	No	No
Temperature Monitoring Equipment	No	No	No
ISFSI Storage Pad	No	No	No
ISFSI Security Equipment(6)	No	No	No

Reference Notes are on following slide

NAC-MPC/NAC-UMS CoC Renewal Projects
SSC Scoping Results

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Notes:

(1) SSC is Important-to-Safety (ITS)

(2) SSC is Not-Important-to-Safety (NITS), but its failure could prevent an ITS function from being fulfilled

(3) Fuel pellets are not within the scope of the renewal

(4) Fuel transfer equipment includes a) the adapter plate and hardware to position the transfer cask with respect to the storage or transport cask; b) lifting yoke for the transfer cask; c) lifting slings for the canister and canister lids, d) air pallets, e) heavy haul trailer, and f) vertical cask transporter (applicable to facilities that still retain transfer equipment on site).

(5) Ancillary equipment includes canister closure equipment used to drain, backfill, and seal the canister (e.g., the suction pump equipment, the vacuum drying system, automated or manual welding equipment, weld inspection equipment, and helium backfill and leak detection equipment).

(6) ISFSI security equipment includes the ISFSI security fences and gates, lighting, communications, and monitoring equipment.

(7) Applicable to sites that still retain a Transfer Cask (TFR) on-site and to TFRs in storage under NAC control. NA to facilities that have disposed of the equipment or the equipment is not in service.

NAC-MPC/NAC-UMS CoC Renewal Projects
Work Completed: Pre-Application Inspection 1

- **Fall 2015: EPRI NDE Demonstration, Palo Verde NGS, Tonopah, AZ (NAC-UMS)**
  - Dummy TSC placed in VCC on construction pad
  - Dry Cask Cutaway, Training Center
  - NAC-UMS Vent Mock-up
- **Spring 2016: EPRI NDE Demonstration, McGuire NS, Huntersville, NC (MAGNASTOR)**
  - Unloaded TSC in VCC on construction pad
- **Summer 2016: EPRI NDE Demonstration/NAC Pre-Application Inspection 1, Maine Yankee, Wiscasset, ME (NAC-UMS)**
  - Loaded GTCC Canister in VCC #2 on ISFSI pad

NAC-MPC/NAC-UMS CoC Renewal Projects
Pre-Application Inspection Number 1

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- **Visual Inspections**
  - VCC Lid
  - VCC Lid Gasket
  - Shield Plug and Shield Plug Cavity
  - VCC Lid Bolts
  - VCC Lid Bolt Holes
- **Surface Chemistry Sampling and Testing**
- **Video Inspection through Inlet and Outlet Vents**
  - Four Small Rust Colored Spots
  - Coating Damage associated with edges of carbon steel structures
- **Radiation Survey of GTCC canister**
- **Thermography Demonstration**

NAC-MPC/NAC-UMS CoC Renewal Projects
Current Work

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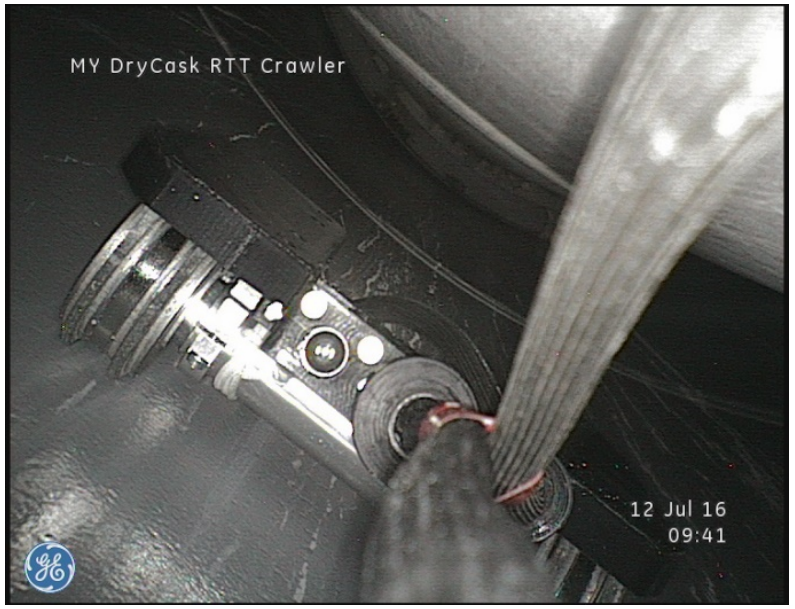
- **Time Limited Aging Analyses Process:**
  - Developing appropriate analyses (e.g., fatigue, corrosion, boron depletion) using guidance in draft MAPS NUREG and experience with VSC-24 application
  - Completing entry of design basis documents in Access database and performing screening against TLAA criteria found in NUREG 1927 R1
  - Plan to perform final review of screened-in TLAAs
- **Aging Management Programs Process:**
  - Developing applicable AMPs using draft MAPS NUREG and VSC-24 application as guides.
- **NAC-MPC and NAC-UMS CoC RA templates:**
  - Revising tables and some text in Sections 2 and 3 based on review of advanced copies of NAC-MPS and NAC-UMS sections of MAPS NUREG draft
  - Plan to add information TLAA and AMP information to Section 3 (as well as Appendices A, B) by end of 2017

NAC-MPC/NAC-UMS CoC Renewal Projects
Pre-Application Inspection Number 2 in 2018

- **NAC plans to conduct an additional pre-application inspection in Summer 2018 at Maine Yankee (NAC-UMS site); inspection is to be done on a best effort basis informed by the EPRI Aging Management Guidance (EPRI 3002008193); NAC inspection task plan and procedures are to be generated and followed.**
- **Cask to be inspected was chosen based on the criteria presented in the EPRI CISCC Susceptibility Assessment Criteria Report and is considered bounding for both NAC-MPC and NAC-UMS systems in the NAC fleet.**
  - NAC-MPC and NAC-UMS are sister designs that accommodate different size fuel
  - NAC-MPC and NAC-UMS casks have overall CISCC susceptibility scores that are in the middle of the EPRI Susceptibility Criteria—i.e., scores are 4s and 5s on scale of 10 for the entire population of NAC-MPC and NAC-UMS canisters in service. (MY has 25 level 4 canisters and 35 level 5 canisters.)
  - No site is near a large body of salt water (MY is about 170 m from the brackish waters of the Back River—salt content between 1% to 1.5%--and is approximately 12 miles from the open ocean.)
  - MY has been performing long-term measurement of chloride and sulfate aerosol concentration in the local atmosphere as well as salt concentration measurements on local surfaces including VCC inlets and outlets.
  - Four candidate TSCs were chosen with initial heat loads of 4.26 to 4.35kW and with time in service of nearly 15 years (current heat loads are under 4 kW)
  - Final decision on the MY TSC will be based on accessibility and other site factors
  - “Runner-up” site was CY with three candidate TSCs having current heat loads under 6 kW and time in service of 12 years

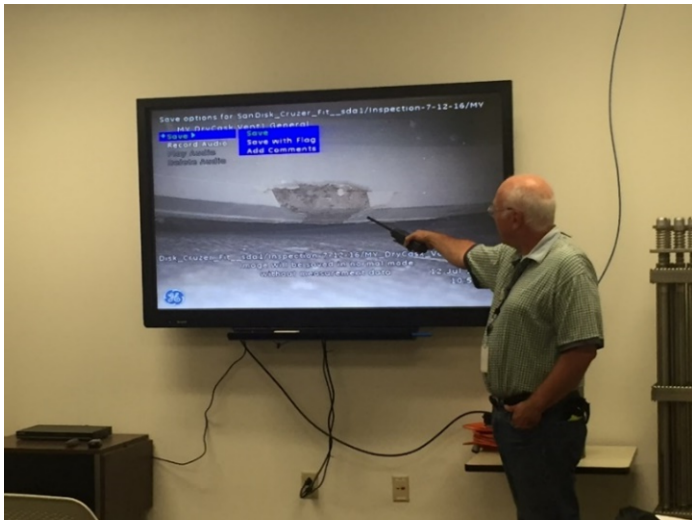
NAC-MPC/NAC-UMS CoC Renewal
Pre-Application Inspection(s) Plan for 2018

- Conducting discussions with prospective prime subcontractor for the inspection
- Inspection is to be done turn-key by a third party team led by NAC; team members will include NAC PM, 2 NDE inspection resources, and 1 Remotely Operated Vehicle (ROV) Technician
- Inspection capability will be VT by means of borescope and ROV



NAC-MPC/NAC-UMS CoC Renewal
Pre-Application Inspection(s) Plan for 2018

- Division of Responsibilities document (Maine Yankee, NAC, Inspection vendor, ROV vendor) has been drafted and will be finalized
- Intend to remove the VCC lid and shield plug; shield plug removal will be brief, allowing only for samples, swipes and perhaps some borescope activity
- A final report documenting this inspection will be delivered to NAC as a separate document from the raw video



NAC-MPC/NAC-UMS CoC Renewal
Pre-Application Inspection(s) Plan for 2018

- Per NUREG 1927, pre-application inspections “demonstrate that an aging effect either does or does not require management.” Therefore, pre-application inspections are done for a specific aging mechanism.
- Propose use of data from inspections that have been done already to add substance to the CoC RAs. Examples:
  - 1) Use existing data from MY/CY/YR concrete cask inspections to demonstrate that freeze/thaw is adequately controlled by existing inspection requirements
  - 2) Use MY VCC lid lift inspection in July 2016 to provide data to support AMPs for the VCC lid bolted joint

NAC-MPC/NAC-UMS CoC Renewal
Work Remaining

- Incorporate pre-application inspection results in Section 3 and the appendices of the NAC-MPC/NAC-UMS CoC RA templates as appropriate
- Develop new FSAR chapters and any changes to Technical Specifications for the two systems
- Perform final Industry Peer Review and internal technical and editorial reviews of the two applications and address comments
- Submit the final NAC-MPC CoC RA by December 2019
- Submit the final NAC-UMS CoC RA by September 2020

Questions?

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