



Trojan ISFSI

License Renewal and AMP Inspections

December 8, 2016



- Approximately 45 miles north of Portland, Oregon along the Columbia River



- Storage pad on engineered fill / bedrock foundation
- Sierra Nuclear ventilated Concrete Casks based on VSC-24 design
- Holtec MPC-24E and MPC-24EF fuel canisters
- Transfer Station for MPC transfers between Concrete Casks and Transportation Casks
- Impact limiter embedded in Transfer Station Pad for use during MPC transfers
- Holtec Transfer Cask, for use during MPC transfers

- Site-specific license
- Fuel loaded December 2002 – September 2003 in single, continuous loading campaign (34 casks total)
- No high-burnup fuel
- Heat loads at time of fuel load were in the 6 - 17 kW range

- Contracting with Holtec to prepare license renewal application
- Following guidance in NUREG-1927 and NEI 14-03
- Applying for 40 year extension
- Using Calvert Cliffs renewed license as guidance
- License expires on March 31, 2019; must submit application by March 31, 2017
- Preparing Environmental Report supplement as part of application
- Relying on recent 72.30 submittal for financial update

- Chapter 1 – General Information
- Chapter 2 – Scoping Evaluation
- Chapter 3 – Aging Management Review
- Chapter 4 – Aging Management Tollgates
- Appendix A – AMPs
- Appendix B – TLAAs
- Appendix C – Tollgates
- Appendix D – Proposed ISFSI SAR Updates
- Appendix E – Proposed License / Tech Spec Changes
- Appendix F – Lead Canister Inspection

Steps in preparing application:

1. Identify in-scope subcomponents requiring aging management review
2. Identify materials/environment
3. Identify aging effects requiring management
4. Determine activity required to manage the effects of aging (TLAA / AMP)

Criteria to determine which SSCs are within the scope of the renewal, per NUREG-1927, Section 2.4.2:

- 1) Classified as Important-To-Safety, based on performance of one of the following functions:
 - i. Maintain the conditions required by the regulation or specific license to store spent fuel safely
 - ii. Prevent damage to the spent fuel during handling and storage
 - iii. Provide reasonable assurance that spent fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public
- 2) Classified as Not-Important-To-Safety, but their failure could prevent fulfillment of a function that is ITS

SSCs ensure that safety functions are met for:

- 1) Confinement
- 2) Radiation shielding
- 3) Sub-criticality control
- 4) Heat-removal capability
- 5) Structural integrity
- 6) Retrievability

Applicable material environments:

1. Inert Gas (inside MPC)
2. Sheltered (MPC / Concrete Cask annulus)
3. Embedded (Concrete Cask reinforcement)
4. Exposed (outside)

Trojan ISFSI Renewal Application - Scoping



SSC	Scoping Results		In-Scope SSC
	Criterion 1	Criterion 2	
MPC	Yes	N/A	Yes
Transfer Cask	Yes	N/A	Yes
Concrete Cask	Yes	N/A	Yes
Fuel Assembly	Yes	N/A	Yes
ISFSI Pad	No	No	No
ISFSI Security Equipment	No	No	No
Transfer Station (including Transfer Station Pad and Impact Limiter)	Yes	N/A	Yes
Fuel Transfer and Auxiliary Equipment	No	No	No

Transfer Cask AMP



Transfer Cask AMP



Transfer Cask AMP



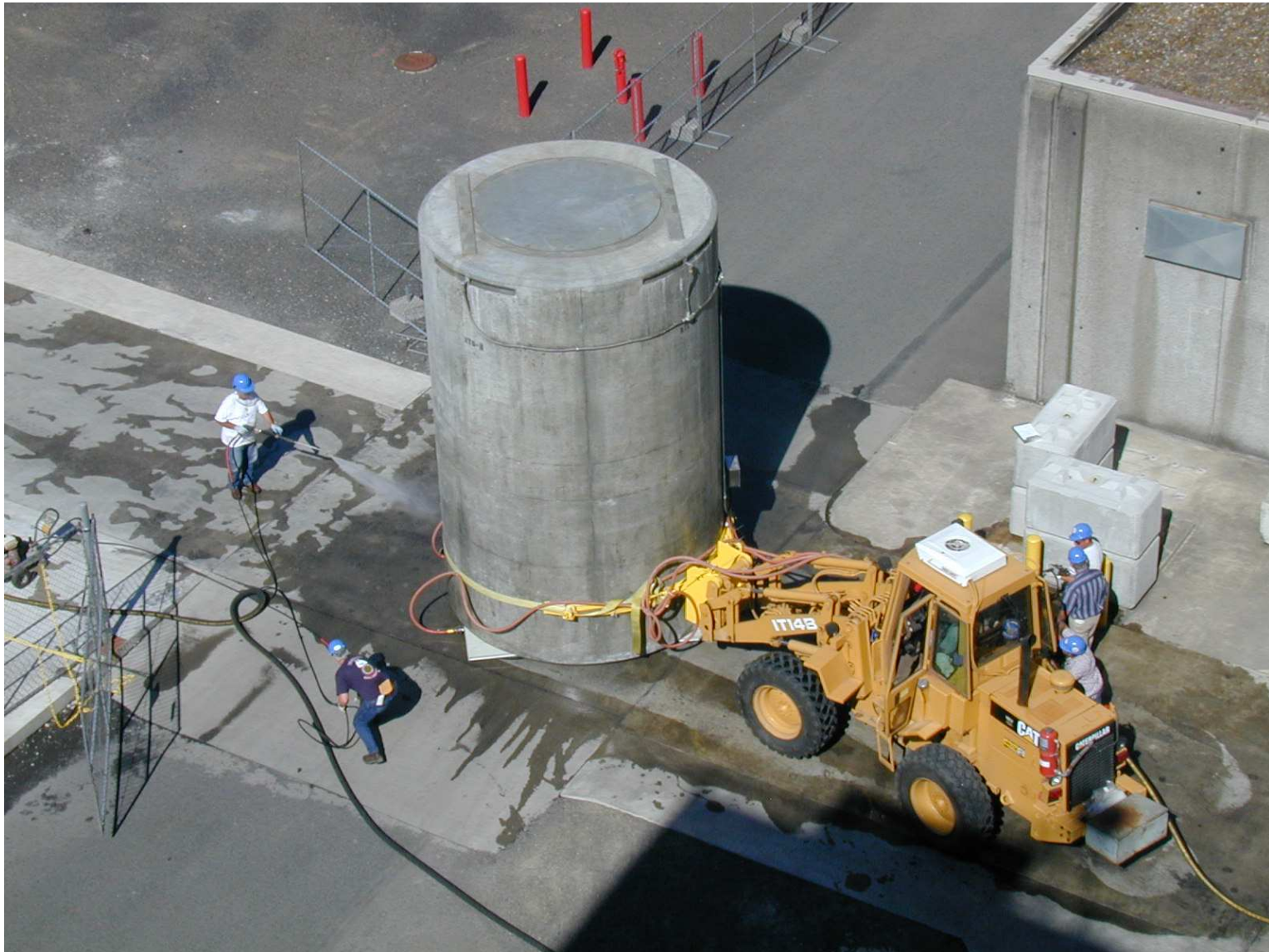
- An annual visual inspection is currently performed per the Trojan Structural Inspection Program
 - Accessible surfaces
 - Excessive corrosion, pitting, loss of paint
- AMP includes inspection prior to use in the Transfer Station
 - Painted surfaces inspected for corrosion and chipped, cracked, or blistered paint
 - Lid surfaces inspected for dents, scratches, gouges, or other damage
 - Water jacket inspected for leaks
 - All other surfaces inspected for dents, scratches, gouges, or other damage

- The ISFSI Storage Pad did not screen in-scope for aging management
- An annual visual inspection of the pad is performed per the Trojan Structural Inspection Program and this will continue after license renewal
- Inspection criteria are similar to those for the Concrete Cask exterior (concrete) surfaces



- An annual visual inspection is currently performed per the Trojan Structural Inspection Program
 - Excessive corrosion, pitting, loss of paint
- AMP includes inspection prior to use for MPC transfers
 - Painted surfaces inspected for corrosion and chipped, cracked, or blistered paint
 - All other surfaces inspected for dents, scratches, gouges, or other damage
- AMP includes inspection of Transfer Station Pad
 - Inspection and acceptance criteria similar to those for the Concrete Cask exterior (concrete) surfaces

Concrete Cask AMP



External Inspections

- Visual inspection per ACI 349.3R-02, including three tier acceptance criteria:
 - (1) acceptance without further evaluation
 - (2) acceptance after review
 - (3) acceptance requiring further evaluation
- Deficiencies meeting criteria (2) or (3) resolved in Trojan Corrective Action Program
- Technical justification may be provided to deviated from ACI 349.3R-02 acceptance criteria

Internal Inspections

- Concrete Cask interior consists of carbon steel liner coated with inorganic zinc-rich coating
- Minor surface rust blooms observed during previous inspections, evaluated as acceptable
- Future inspections on five year interval while inspecting accessible portions of MPC exterior

Concrete Cask AMP



- Visual inspection of one MPC using video scope through inlet and outlet vents
 - Accessible surfaces
 - VT-3 examination per ASME Section XI, Article IWA-2200
 - May be extended to VT-1 based on results
 - Five year interval
 - First cask placed in service (lowest heat load also)
 - Previously inspected in 2008 and 2013 during Concrete Cask interior inspection

- Proposing to credit existing inspection program for required pre-application inspections
- Proposing to use scheduled 20 year inspection as “baseline” inspection in year 2023 (license issued in 1999 but fuel loaded in 2003)
- Selected experienced contractor (GE Inspection Technology) to perform work
- Inspection procedure prepared by Contractor Level III Inspector, reviewed by PGE Level III Inspector

- Fabricated and used full scale outlet vent mockup prior to first inspection, to validate methodology
- Selected video scope with articulating tip for image quality, and used quartz fiber optic cable to minimize radiation effects
- Took large area swipes in vents to confirm absence of contamination
- Used 18% neutral gray card at start and end of each video recording to verify image quality

- Completed inspection in one day
- All vent passages areas were clear other than minor dirt accumulation and some very small wasp nests
- Cask / MPC annulus completely clear
- Confirmed condition of insulating tiles underneath MPC
- A few small areas of surface rust (through a zinc-rich coating on the Concrete Cask inner liner) were present; no pitting or significant loss of material

- Patches of white surface residue present at junction between upper vent plenum and cask liner plate (not a welded joint)
- Could not sample white residue, but its appearance was similar to deposits on outside of cask (calcium carbonate)
- Deposits appear to have been present during cask construction; evaluated as having no effect on concrete strength or integrity
- No apparent changes in deposits between 2008 and 2013 inspections

- Eliminated the use of contamination sleeving during 2013 inspection after verifying absence of contamination in 2008 inspection; this made use of the video scope much easier
- Allowed technicians to extend hands 6 inches into vent openings during 2013 inspection based on previous experience; this improved the ability of inspectors to manipulate the video scope
- Eliminated the use of paper suits during the 2013 inspection based on previous experience; this made inspection activities easier

Previous MPC Inspections



Previous MPC Inspections



Previous MPC Inspections





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