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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001

Subject: Ventilated Storage Cask Inspection Summary Report

Palisades Nuclear Plant
Dockets 50-255 and 72-7
License No. DPR-20

Dear Sir or Madam:

Entergy Nuclear Operations, Inc. (ENO) is providing the summary report required by Section 1.3.3, of Attachment A, of the dry fuel storage (DFS) Certificate of Compliance.

Section 1.3.3 requires that the ventilated concrete cask (VCC) interior surfaces and the multi-assembly sealed basket (MSB) exterior surfaces of the first ventilated storage cask (VSC) placed in service be inspected after every five years in service. The inspection is to identify potential air flow blockage and material degradation. A report summarizing the findings is required to be submitted within 30 days from the conclusion of the inspection. The first VSC, serial number CVCC-24-01, was placed in service at the Palisades Nuclear Plant on May 12, 1993. The previous inspection was conducted in July 2013.

A remote visual inspection of the VCC interior surfaces was performed on July 24, 2018. Surfaces inspected included readily accessible areas of the ventilation flow path off the VCC air inlets and outlets for unacceptable blockage, readily accessible areas of inside surfaces of the VCC air inlets and outlets for unacceptable corrosion, readily accessible areas of the annulus-facing surfaces of the VCC Cask Liner Bottom for unacceptable corrosion, readily accessible areas of the VCC Cask Liner Shell for unacceptable corrosion, readily accessible areas of the VCC Shield Ring Plates for unacceptable corrosion, and readily accessible areas of the MSB Shell for unacceptable corrosion. The inspection concluded:

1. The VSC cooling paths were free of air flow blockage.

2. The VCC interior surfaces and the MSB exterior surfaces were in good condition and considered to be normal for the VSC service environment and the specified materials of construction described in the Safety Analysis Report (SAR).
3. No additional degradation mechanisms affecting system performance were identified.

The inspection summary report is provided in Enclosure 1.

This letter contains no new commitments and no revisions to existing commitments.



JAH/bed

Attachment 1: Ventilated Storage Cask Inspection Summary Report

CC Regional Administrator, USNRC, Region III
Project Manager, USNRC, NRR
NRC Resident Inspector – Palisades

ATTACHMENT 1

VENTILATED STORAGE CASK INSPECTION SUMMARY REPORT

PURPOSE

This report summarizes the results of the ventilated concrete cask (VCC) interior surface inspection conducted on ventilated storage cask (VSC) serial number CVCC-24-01, which is the first VSC-24 cask placed in service at the Palisades Nuclear Plant (PNP). The VCC interior surfaces and the multi-assembly sealed basket (MSB) exterior surfaces of the first VSC placed in service are required to be inspected after every five years in service, as specified in Section 1.3.3, of Attachment A, of the VSC-24 Certificate of Compliance, to identify potential air flow blockage and material degradation.

DISCUSSION

The VSC air flow cooling path surfaces that were inspected are the VCC air inlet and air outlet assemblies, the VCC interior and the MSB exterior.

Inspection Equipment

The inspection was performed using a GE Visual Inspection Custom quartz fiber probe with an internal light source to illuminate the surfaces for inspection. A monitor was used to view the surfaces and a DVD recorder was used to provide a record of the inspection.

Inspection Methodology

Access for the inspection of the VCC interior and the MSB exterior surfaces was achieved through the VCC air inlet and air outlet assemblies. The air inlet and air outlet protective screens were partially removed as needed to facilitate entry of the video probe. The interior surfaces of the air outlet assemblies, the VCC liner interior, and the MSB exterior surfaces (which form the air flow annulus) down to the top of the air inlet hole in the floor of the VCC were inspected via access through the air outlet assembly.

Inspection Results

The results are summarized below for the VSC cooling path (inlet, annulus, outlet) surfaces inspected.

Air Outlet Assembly Interior Surfaces

The outlet vents had areas of considerable rust bleed-through in areas where proper surface preparation was difficult to attain. The areas where the coating has flaked are considered to have light to medium rust with minor pitting. The pitting was previously noted in the 1998, 2003, 2008, 2013 reports. There appears to be no significant progression of the rust when comparing the previous inspection results. The function of the outlet vent steel is maintained with the existing condition. The noted vent rust does not result in blockage greater than 10% of the cross sectional area of the flow path, meaning the acceptance criteria is met.

VCC/MSB Annulus

The VCC/MSB annulus from the air outlet assemblies to the air inlet hole in the floor of the VCC was free of significant blockage. Some minor blockage was noted in the inspection (inactive insect nests) that did not result in greater than 10% cross sectional area blockage. The noted blockage was not removed since it was not readily retrievable.

- VCC Liner Interior Surface

Minor areas of coating degradation were noted but did not result in exceeding any acceptance criteria. No corrosion was observed during the inspection. It was also noted that the top sides of some circumferential welds contained debris (soil and dust) that had settled on top of the coating.

- MSB Exterior Surface

Degradation of the paint coating was noted in the lower section of the cask and at the center circumferential weld. This coating degradation does not appear to be active and appears to be original to cask assembly. In some isolated areas the coating is cracking in a small checkerboard or alligator pattern. In all the area mentioned above no corrosion was observed. It was also noted that the top sides of some circumferential welds contained debris (soil and dust) that had settled on top of the coating.

Air Inlet Assembly Interior Surfaces

The air inlet assemblies, from the protective screens to the air inlet hole in the floor of the VCC, were found to be free of blockage. Minor debris (paint chips, leaves, small twigs) were identified in the air inlet assembly. The VCC inlet steel surfaces exhibited some light to medium rusting, as noted in the 1998, 2003, 2008, and 2013 inspections. There was no significant change in the condition of the VCC inlet liner steel.

SUMMARY EVALUATION

Evaluation of the results from the VCC interior inspection on VSC serial number CVCC-24-01 after 25 years in service indicates the following:

- The internal air flow paths inside the VCC were found to be free of obstruction. This is consistent with the daily thermal performance monitoring data. Thus, there is indication that the thermal performance of the cask has not degraded and that the cask is operating properly.
- There were no new findings from the results summarized in previous inspections.
- Degradation on the MSB coating was observed but did not exceed the inspection acceptance criteria. Operability of the MSB continues to be demonstrated by the daily surveillances which assure that the air inlet/outlet screens are free from blockage and verify satisfactory cask thermal performance.
- Surface rust was noted on the interior surfaces of the air inlet and air outlet assemblies. These assemblies serve only as a concrete form during fabrication and perform no structural or shielding function.
- Air Inlet Assemblies – Minor debris that has no impact on air flow pathway observed.
- The inspection was performed using Palisades Technical Specification Surveillance Procedure number FT-6 “Five Year Inspection of the First VSC Placed in Service.” The inspection concluded that all the acceptance criteria were met.

CONCLUSION

The VSC cooling paths were found to be free of air flow blockage. The VCC air inlet and air outlet assemblies, the VCC interior surfaces and the MSB exterior surfaces were found to be in good condition and are considered to be normal for the VSC service environment and the specified materials of construction described in the safety analysis report (SAR). The inspection did not identify any degradation mechanisms affecting system performance that were not identified in the SAR.

The VSC was found to be performing as described in the SAR, and no additional degradation mechanisms affecting system performance were identified.