

NRC ISFSI Pad Surveys at San Onofre Nuclear Generating Station

Scope:

To perform independent measurements and verifications of radiological conditions at San Onofre Independent Spent Fuel Storage Installation (ISFSI). The measurement locations included background areas, public access areas in the owner controlled areas, protected areas of the facility, and representative measurement areas on both generally licensed ISFSI Pads: Transnuclear, (TN) Inc. Nuclear Horizontal Modular Storage (NUHOMS) and Holtec HI-STORM UMAX dry fuel storage systems.

Equipment Used:

The NRC used a Ludlum Model 19, a sodium iodide instrument calibrated to Cesium-137, which is representative of the gamma energy level at the facility. The instrument used was NRC Tag Number 033906, serial number 84259, with an annual calibration due date of July 23, 2019.

Survey Methodology:

On October 22, 2018, all surveys were performed by the NRC Inspectors.

The survey methodology for the Holtec HI-STORM UMAX systems consisted of a gamma exposure rate at 16 points on each Vertical Ventilated Module (VVM) that was loaded. The points encompassed 8 inlet air vents (Figure 1), 4 points on the closure lid at locations representing 0°, 90°, 180°, and 270° (Figure 2), and at 4 points on the outlet air vent at locations representing 0°, 90°, 180°, and 270° (Figure 2).

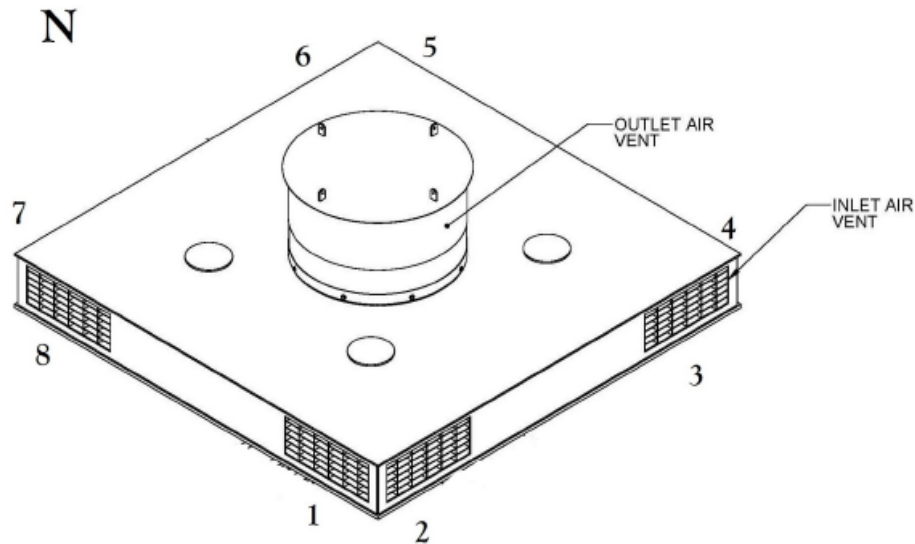


Figure 1

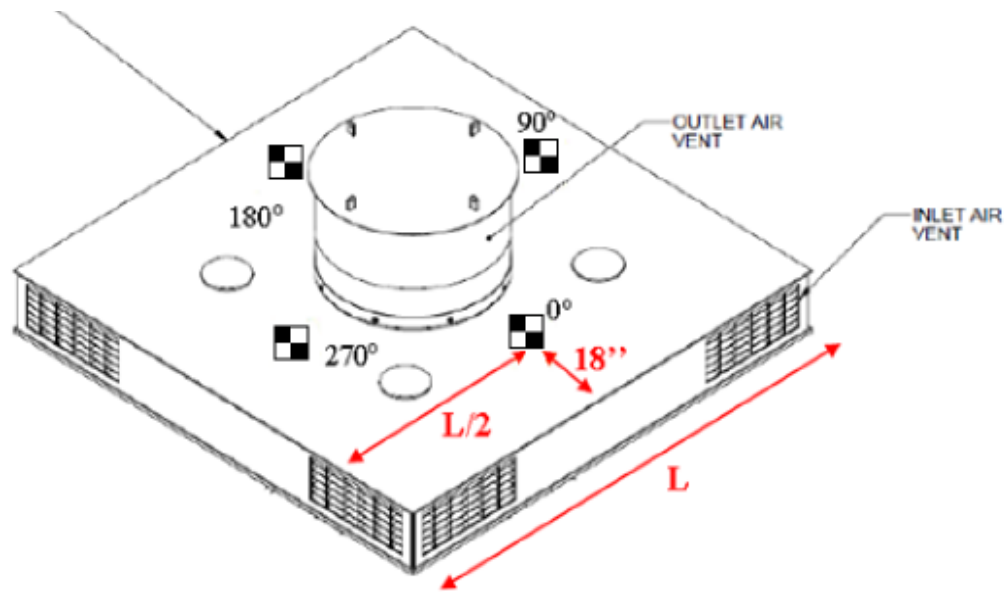


Figure 2

The survey methodology for the TN NUHOMS systems consisted of a gamma exposure rate survey at two points on the air inlet vent for each loaded TN system. These measurement points consisted of a contact survey measurement on the air inlet vent and at 1 foot away from the air inlet vent (Figure 3), for each of the loaded TN systems.

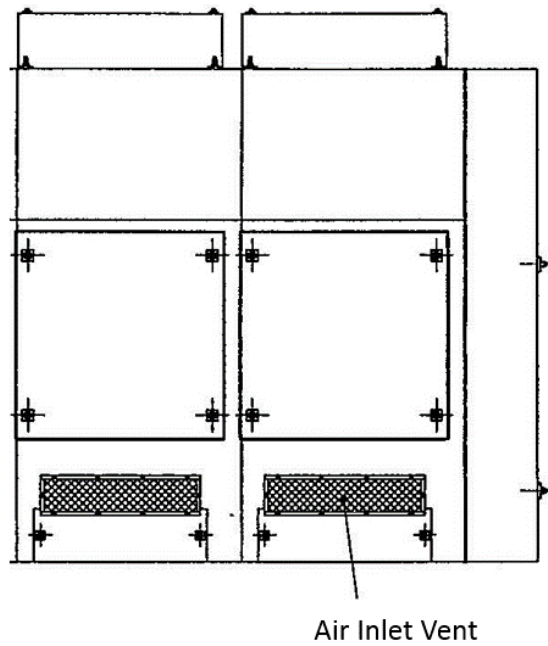


Figure 3

In addition, the NRC performed survey measurements at many locations around the ISFSI pad, Unit 1 Reactor Pressure Vessel, behind the sea wall of the plant, in the upper parking lot of the plant access, and along the bluff overlooking the ISFSI pad. The NRC identified the survey measurement location for each data point on maps of the site layout and documented the data on data point sheets for each of the loaded canister systems.

Results of NRC Surveys:

Holtec HI-STORM UMAX:

Highest gamma measurement was from VVM #33:

Inlet air vents: 330 μ R/hr

Closure lid: 18 μ R/hr

Outlet air vent: 240 μ R/hr

Lowest gamma measurement was from VVM #22:

Inlet air vents: 160 μ R/hr

Closure lid: 15 μ R/hr

Outlet air vent: 120 μ R/hr

General area gamma exposure rate on the Holtec UMAX pad ranged between: 8-15 μ R/hr

TN NUHOMS:

Highest gamma measurement was from TN #21:

Inlet Vent on Contact: 1,600 μ R/hr, 1 Foot Away from Inlet Vent: 1,100 μ R/hr

Lowest gamma measurement was from TN #15:

Inlet Vent on Contact: 100 μ R/hr, 1 Foot Away from Inlet Vent: 70 μ R/hr

General area gamma exposure rate on the TN pad ranged between: 4-14 μ R/hr

Other survey measurement results include the following locations:

Unit 1 Reactor Vessel: Highest Gamma Measurements: 20 μ R/hr

Lowest Gamma Measurements: 6 μ R/hr (both sides)

Along the beach behind the sea wall ranged between: 5-10 μ R/hr

Along the bluff overlooking the ISFSI Pad ranged between: 3-6 μ R/hr

Upper Parking Lot ranged between: 4-8 μ R/hr

Southern California Edison Dose Rate Limits:

Holtec HI-STORM UMAX: (Technical Specification 5.3.3)

Locations	Neutron	Gamma	Total
Closure Lid Cover Plate	200 μ R/hr 0.2 mR/hr	400 μ R/hr 0.4 mR/hr	600 μ R/hr 0.6 mR/hr
Outlet Vents	1,000 μ R/hr 1.0 mR/hr	1,800 μ R/hr 1.8 mR/hr	2,800 μ R/hr 2.8 mR/hr

TN NUHOMS:

There are no cask related technical specifications.

Conclusion:

Based on the surveys performed on October 22, 2018, the NRC has no safety or regulatory concerns with the loaded spent fuel canisters on the ISFSI Pads at San Onofre. The independent surveys performed by the NRC using NRC survey instruments which are calibrated annually, were all well below the applicable technical specifications values. The highest dose rate values that were measured were the TN NUHOMS System at 1,600 μ R/hr on contact and 1,100 μ R/hr at 1 foot away from the Inlet Vent.

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License Nos.: DPR-13; NPF-10; NPF-15