

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-206/86-31

Docket No. 50-206

License No. DPR-13

Licensee: Southern California Edison Company
2244 Walnut Grove Avenue
Rosemead, California 91770

Facility Name: San Onofre Nuclear Generating Station - Unit 1

Inspection at: San Onofre Nuclear Generating Station

Inspection Conducted: June 18-20, 23-24, 30-July 2, 1986

Inspector: Salbert Young Jr. for 7-8-86
D. J. Willett, Reactor Inspector Date Signed

Inspector: Salbert Young Jr. for 7-8-86
J. Driscoll, consultant ANL Date Signed

Inspector: Salbert Young Jr. for 7-8-86
M. Barnes, consultant ANL Date Signed

Approved By: Salbert Young Jr. 7-8-86
T. Young Jr. Chief Engineering Section Date Signed

Summary:

Inspection on June 18-20, 23-24, 30-July 2, 1986 (Report Nos. 50-206/86-31)

Areas Inspected: Routine, announced inspection of licensee action on previous inspection findings regarding the Control Room Emergency Ventilation System. Witnessing of ventilation system testing to identify system in-leakage and determine system flows and interaction with adjacent boundaries during various operating modes.

Results: Of the areas inspected, no violations or deviations were identified.

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DETAILS

1. Persons Contacted

Licensee Personnel

@ D.E. Nunn, Manager of Nuclear Generation Services
@ M.A. Wharton, Deputy Station Manager
@ # M.P. Short, Unit-1 Project Manager
@ D.L. Johnson, Cognizant Engineer, Ventilation
M.S. Tolson, Nuclear Safety Engineer
@ T.A. Mackey Jr., Supervisor Compliance
@ N.D. Nelson, Project Manager, Bechtel
@ # L.A. Bennett, Unit-1 Licensing Engineer
@ M.F. Freedman, Compliance Engineer
@ G.T. Vechinski, Bechtel Engineer
S. Freid, Bechtel

NRC personnel

@ # J.J. Hayes, NRR Plant Systems Branch
@ # D.J. Willett, RV Reactor Inspector
@ # J.W. Driscoll, Consultant Argonne Lab's
@ M.D. Carnes, Consultant Argonne Lab's
T. Young, RV Engineering Section Chief
R. Pate, RV Reactor Projects Branch Chief
J. Milhoan, NRR Plant Systems Branch Chief
R. Dudley, NRR Project Manager

The inspectors also held discussions with other licensee and contract personnel during this inspection. These included licensed and non licensed operators, plant staff engineers, technicians, administrative assistants and quality assurance personnel.

@ Denotes those present during the exit meeting on June 20, 1986.

Denotes those principals present during a series of teleconferences between June 24 and July 2, 1986.

2. System Measurements

On June 18-20, 23-24, 30-July 1, 1986, a region V inspector accompanied by two consultants from Argonne National Laboratories, witnessed licensee efforts to upgrade and verify system performance. The inspectors also took independent flow measurements of the Control Room (CR) and Technical Support Center (TSC) ventilation systems, while these systems were in the normal and emergency modes of operation. Data sets recorded were for the following combinations of operating modes :

(1) CR ventilation system in Normal, TSC system in Normal

(2) CR ventilation system in Emergency mode, TSC system in Normal

- (3) CR ventilation system in Emergency mode, TSC system in Emergency
- (4) CR ventilation system in Emergency mode, TSC Normal & Emergency systems secured.

In addition to the flow measurements taken with a hot-wire anemometer, differential pressure measurements were recorded across the control room to TSC, control room to outside, and TSC to outside boundaries with a differential pressure gauge and an inclined manometer.

The inspectors compared the flow and delta pressure measurements they took during the four operating configurations. The results of this comparisons verified the licensee's measurements which were submitted to NRR on June 29, 1986. NRR will issue their evaluation and recommendations in a report once they have completed a review of the licensee's system design, flow and delta pressure data, source term and assumptions utilized for control room dose calculations.

3. Ventilation System Repairs And Modifications

The licensee identified and sealed many sources of control room inleakage. This inleakage was from duct work seams, approximately 50 penetrations between the control room and TSC, door seals and numerous fan housing leaks, one of which was approximately 2 inches by 8 feet.

The licensee blanked off the supply duct to the I&C Shop to increase the control room positive pressure margin. The register for this twelve inch duct was closed during previous NRC flow measurements. Additionally, blanking off this duct will preclude personnel from opening the register and upsetting the systems flow balance, since maximum register opening had the potential for very high flow.

The licensee installed a fire damper between the TSC and the hallway leading to the control room. This damper is positioned partially open so that the pressure differential between the TSC and the control room can be maintained at greater than or equal to 1/8 inch water gauge.

The licensee attempted to seal the return duct work which leads from the control room through the electrical switchgear room to the suction of the supply fan. After the sealing the licensee blocked off the return ducting, and installed a special test setup to quantify duct leakage. This setup consisted of a fan supplying the duct work through a long straight run of temporary ducting with a variable opening in the return ducting. Initial leakage was approximately 470 cfm. The licensee continued sealing leaks, and set off smoke bombs inside the ducting while pressurized to search for leakage. The licensee attempts to minimize leakage resulted in a final inleakage of approximately 250 cfm.

4. Charcoal Efficiency

During a review of NRC concerns regarding charcoal filter efficiency, the licensee discovered that the system was designed for a 1/8 second filter residence time instead of 1/4 second that had been assumed and used for

testing by the licensee. The decrease in residence time results in a decrease in efficiency.

An additional concern regarding the moisture content of the in-place charcoal was discussed with the licensee. The unit is subject to high humidity from the atmosphere (ocean and drains in HVAC room).

The licensee intends to change out the existing potassium-iodide impregnated charcoal to a TEDA type of charcoal, which is more humidity resistant, soon after plant restart. In the time prior to plant restart the licensee has proposed to do testing which is acceptable to the NRC that will demonstrate that the charcoal filters are not degraded due to moisture or will replace the present charcoal filter with new charcoal.

5. Restart Criteria

As a result of flow and pressure measurements taken by NRC in May (IE rpt. # 50-206/86-25) and after teleconferences between Region V, NRR and SCE on June 4, 5, 10 and 11, 1986, NRR provided SCE with the following four criteria for the restart of Unit-1:

1. Control room emergency ventilation system charcoal adsorber is capable of removing at least 95 % of the organic radioiodines.
2. Control room operator thyroid doses are less than 30 Rem with dose assumptions specified in acceptance criterion 2 unless justified on a plant specific basis.
3. Control room envelope is maintained at a positive pressure with respect to all surrounding boundaries.
4. That unfiltered inleakage to the control room envelope and the control room ventilation system ductwork be minimized.

NRR also provided the following guidance on how the four restart criteria can be satisfied :

Criteria 1. Flow through the emergency filtration unit will be + or - 10 % of design flow.

Technical Specification 4.11.B.2 which will require that laboratory test on the charcoal be performed at 30 °C instead of 130 °C with a allowable penetration of 0.7 % for methyl radioiodide. The Technical Specification change will not be required prior to restart.

Criteria 2. NRR will review SCE dose assumptions considering the use of respirators and thyroid blocking KI tablets. However this is not a long term solution and the licensee has been advised that these measures are not appropriate or meeting TMI Action Item III.D.3.4.

Criterion 3. Periodic tests will be required to verify that the control room envelope is pressurized to at least 1/8 in. water gauge with respect to adjacent areas.

Criterion 4. Periodic tests will be required to verify unfiltered inleakage based on actual plant measurements.

6. Exit Interview

The inspection team met with representatives (denoted in paragraph 1) on June 20, 1986 and subsequent teleconferences. The scope and findings of the inspection, which were discussed during this meeting and teleconferences are summarized as set forth in paragraphs 1 through 5 of this report.