

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/84-08

Docket No. 50-346

License No. NPF-3

Licensee: Toledo Edison Company
Edison Plaza
300 Madison Avenue
Toledo, OH 43652

Facility Name: Davis-Besse Nuclear Power Plant

Inspection At: Davis-Besse, Unit 1

Inspection Conducted: April 16-19 and May 1, 1984

Inspectors: *JR Greger*
D. E. Miller *for*

5/17/84
Date

N. A. Nicholson
N. A. Nicholson

5/16/84
Date

Approved By: *JR Greger*
L. R. Greger, Chief
Facilities Radiation Protection
Section

5/17/84
Date

Inspection Summary

Inspection on April 16-19 and May 1, 1984 (Report No. 50-346/84-08(DRMSP))
Areas Inspected: Routine, announced inspection of the operational status of NUREG-0737 items, including Items II.B.3. (reactor coolant and containment atmosphere samplers), II.F.1.1. (noble gas effluent monitor), and II.F.1.2. (iodine and particulate effluent samplers); training addressing the above items provided to Chemistry and Health Physics (C&HP) personnel; and selected I&E Information Notices and open items. The inspection involved 60 inspector-hours onsite by two NRC inspectors.
Results: No violations or deviations were identified.

DETAILS

1. Persons Contacted

- *L. Bonker, Health Physics Specialist
- *D. Briden, Chemist & Health Physicist
- *R. Chesko, Nuclear Project Manager
- *D. T. Eldred, Modification Coordinator
- J. Ferguson, Health Physics Specialist
- *J. Helle, Director, Nuclear Facility Engineering
- M. Horne, Health Physics Supervisor
- *C. Kahn, Engineering Tech, I&C
- *S. Quennoz, Assistant Station Superintendent, Operations
- R. Scott, Chemistry & Radiochemistry Supervisor
- *K. Spencer, QA Auditor
- J. Swartz, Maintenance Specialist
- *S. Wideman, Nuclear Licensing

W. Rogers, Senior Resident Inspector
G. Kosloff, Resident Inspector

*Attended the April 19, 1984 exit meeting.

2. General

The inspection, which began at 11:30 a.m. April 16, 1984, was conducted to examine the operational status of NUREG-0737 items, TMI monitors and samplers. The inspectors reviewed a contractor's time-dose studies for collection of a reactor coolant sample, and containment atmosphere and station vent air samples. Isokinetic sampling in the station vent was evaluated and is discussed separately for NUREG-0737, Item II.F.1.2 (particulate and iodine sampling). Two information notices, regarding dosimetry for personnel in nonuniform radiation field and procedures for divers in the spent fuel pool, were discussed with the licensee. Plant tours were taken to observe the TMI monitors.

3. Licensee Action on Previous Inspection Findings

(Closed) Open Item (346/83-03-11): Develop personnel monitoring procedures applicable during emergencies for personnel assigned to the control room and OSC. Involved persons now obtain dosimetry when entering the protected area. Appropriate procedures are being revised. No additional problems were noted.

(Closed) Open Item (346/82-01-20): Installation of containment sampling system in accordance with NUREG-0737 Task Item II.B.3. This item is discussed in Section 5 of this report.

(Closed) Open Item (346/82-01-22): Installation, testing and procedures for station vent sampling in accordance with NUREG-0737 Task Items II.F.1.1 and II.F.1.2. This item is discussed in Section 4 of this report.

4. NUREG-0737 Task Items II.F.1.1 and II.F.1.2 - High Range Noble Gas Effluent Monitors and Sampling and Analysis of Plant Effluents

The inspectors observed the installed Kaman gaseous effluent sampling and monitoring equipment for the station vent, and reviewed the following: (1) procedures for collection of samples; (2) the contractor's time and motion studies to determine if design clarification items appear to have been met; (3) training of appropriate persons; and (4) calibration of monitoring instrumentation. Training of personnel is discussed in Section 7.

The licensee did not have vendor calibration information available for review; this information apparently had not been sent by the vendor (or had not been requested by the licensee). Onsite calibrations, performed using vendor supplied solid radioactive sources, were not sufficient to meet the NUREG-0737 calibration recommendation by themselves. The inspectors asked the licensee to obtain the calibration information from the vendor; to send a copy of the calibration information to the inspectors; and to review the vendor calibrations to determine if further onsite calibrations of the lower ranges of the noble gas monitors is necessary to meet technical specification calibration requirements.

The licensee obtained and reviewed the vendor calibration data the week after the onsite inspection. Licensee representatives stated that they believe the vendor calibration was adequate to meet the requirements of Technical Specification 2.4.4.d; this conclusion was discussed with an inspector during a May 1, 1984 telephone conversation. This matter remains unresolved until this data is reviewed by the inspectors during the next inspection. (Unresolved Item 346/84-08-01)

The inspectors discussed with the licensee the need for them to determine, in conjunction with the vendor, the response of the high range noble gaseous monitors to the short half-life noble gaseous isotopes that would be present post-accident. The inspectors informed the licensee that the determination of expected response of this type monitor to these short half-life isotopes is complex, and should be considered a generic issue by the vendor. This matter will be further reviewed during future inspections. (Open Item 346/84-08-02)

During the May 1, 1984 conversation with the licensee, the inspector learned the sample stream drawn from the stack into the Kaman system is exhausted outside the turbine building near the 623' level. According to NRR representatives, this is not in accordance with Standard Review Plan 11-5 which describes returning the sample stream to the source. This matter was referred to the Meteorological and Effluents Treatment Branch of NRR for resolution.

5. NUREG-0737 Task - Item II.B.3. Post-Accident Sampling System (PASS)

The inspectors examined the PASS and containment atmosphere grab sample station for shielding considerations and sample collection efficiency, and observed a C&HP tester collect a reactor coolant sample using the PASS.

The PASS, specially designed by Bechtel for Davis Besse, is used to collect pressurized and unpressurized reactor liquid samples. The PASS piping and collection apparatus are located in a cinderblock shielded room separate from the PASS control panel. The individual sample lines are not shielded. The system is designed to flush the lines after sample collection in shielded pigs and before re-entry into the room to disconnect and remove the shielded sample. During the review, the inspectors learned that about three feet of flex lines in the pressurized sample portion of the system would not get flushed. Based on an approximation of the inside diameter of the lines and an RCS concentration of 10 Ci/g the inspectors estimated that the exposure rate at one foot would be about 30 R/minute. The pressurized sample is the only method of determining dissolved gases post-accident. The licensee informed the inspectors on April 25, 1984, that calculations made by them subsequent to the onsite portion of this inspection, resulted in an estimated exposure rate of 4.3 R/minute (based on actual sample line ID and source terms for the station). The licensee informed the inspectors, during the inspection, that a design change had been initiated to greatly reduce the length of unflushed lines. This change was completed April 27, 1984, according to the licensee representatives who contacted the inspectors. This design change will be reviewed during a future inspection. (Open Item 346/84-08-03)

Time/dose studies conducted by Bechtel were reviewed; none were available for the pressurized sample collection. Total whole body dose for the unpressurized sample was estimated at 189 mrem, within the GDC 19 recommendation of 5 rem whole body.

The inspectors observed a C&HP tester collect an unpressurized RCS sample with the PASS. The automatic dilution function for this sample was not operable at the time of this inspection. According to licensee representatives, a work request has been submitted for its repair. A transportable leaded dilution chamber designed to limit personal doses to GDC 19 recommendations, was received recently. During the sample collection observed, the C&HP tester mechanically transferred the RCS sample to the dilution chamber for a 1000:1 dilution. This method, although cumbersome, is effective and could be used as a backup system when the dilution system is inoperable.

The post-accident containment air sample station is located on the 545' level of the auxiliary building. Iodine, particulate, and noble gas samples can be pulled from the top of the containment dome and the 653' level. Questions concerning the adequacy of dose considerations to the sample collector were again raised by the inspectors. As the diameter of return piping is larger than the inflow piping, high activity gases remain in the piping when valves are closed for filter and charcoal adsorber collection. This large volume appears to represent a significant source term. Shielding studies by Bechtel and the licensee indicate a total whole body dose of 469 mrem to the person collecting the samples. The inspectors questioned the study's conclusion. The licensee agreed to repeat the study, with special consideration given to the piping design. (Open Item 50-346/84-08-04)

Remote handling tools are available at the containment post-accident sampling station and are intended to be used for post-accident sample collection. The use of remote handling tools is not addressed in procedure ACD 1850.04.08, Post-Accident Sample Collection and Analysis, reviewed by the inspector. The licensee agreed to revise this procedure to include such use. (Open Item 50-346/84-08-05)

6. Station Vent Sampling

As described in a contractor's memos, during preoperational startup testing of the station vent sampling system it was determined that the design sample flow rate was too low and was increased to 3.2 CFM. The reason for the increase was to improve collection efficiency, which was measured by DOP testing for 1.2 and 2.0 CFM sample flow rates at 40 and 72 percent, respectively. The flow rate was then increased to 3.2 CFM where the collection efficiency was 92 percent. This flow rate change was made by taking a flow control valve out of the sampling line and replacing it with stainless steel tubing. The flow rate has remained at 3.2 CFM since.

The increase in flow rate caused a departure from isokinetic sampling characteristics. According to the contractor's memos, the deviation from the isokinetic requirement stated in NUREG-0737, Task Item II.F.1.2, Clarification (3), was given verbal approval by NRR; however, the inspectors were unable to verify the verbal approval. Upon the inspectors' request, the licensee stated that they would submit to NRR a written request for variance from the task item clarification, and that the request would be submitted by May 31, 1984. (Open Item 346/84-08-06)

7. Post-Accident Sample Collection Training

The inspectors reviewed the training given to C&HP personnel for the PASS, Kaman, and containment sampling systems. This training is conducted by, and is the responsibility of, the training department.

All C&HP testers received PASS training during the first quarter of 1984, as documented by attendance sheets and examinations reviewed by the inspector. Each C&HP tester completed an eight-hour classroom lecture session and collected a reactor coolant sample. An inspector reviewed the lesson plan used; no significant problems were noted.

The licensee conducted the first training session addressing the Kaman and containment sampling systems on April 26, 1984, according to a licensee representative. Operational training and sample collection will be scheduled in the near future. All C&HP testers will complete this training. Senior C&HP testers received prior on-the-job training and are currently able to collect samples. An inspector reviewed the proposed lesson plan while onsite; no significant problems were noted.

8. IE Information Notices

The inspectors discussed the following information notices with the licensee and confirmed these issues were addressed in the health physics program.

IE Information Notice 82-31: Overexposure of Diver During Work in Fuel Storage Pool. The licensee has developed a Health Physics Instruction HPI 004, Radiological Requirements for Divers, that is followed during spent fuel pool dives. This is an internal departmental procedure approved by the chemist/health physicist April 4, 1984. C&HP testers have reviewed and are familiar with this instruction.

IE Information Notice 83-59. Dose Assignment for Workers in Non-Uniform Radiation Fields. Procedure HP1602.01.15 of the Radiation Protection Manual specifies that dosimetry is to be worn on parts of the body most likely to receive the highest exposure. The reported dose reflects the highest accumulated whole body dose.

No problems were noted.

9. Exit

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on April 19, 1984. Further discussions were conducted by telephone on May 1, 1984. The inspectors summarized the scope and findings of the inspection with the licensee representatives denoted in Section 1. In response to certain items discussed by the inspectors, the licensee:

- a. Acknowledged that the inspectors will review the vendor calibration of the noble gas effluent monitors to determine if the requirements of TS 2.4.4.d. are adequately met. (Section 4)
- b. Stated that review of the high range noble gas effluent monitor's response to short-lived isotopes would be made. (Section 4)
- c. Stated that the PASS design change for the pressurized sample collection would be completed. (Section 5)
- d. Stated that the time/dose study for the containment atmosphere sample station, with special consideration given to the large diameter piping, would be repeated. (Section 5)
- e. Stated that ACD 1850.04.08 would be revised to include the use of remote handling tools. (Section 5)
- f. Stated that a request would be submitted to NRR, by May 31, 1984, for a variance from isokinetic effluent sampling as specified by NUREG-0737. (Section 6)