U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-346/78-18

Docket No. 50-346 License No. NPF-3

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

Facility name: Davis-Besse Nuclear Power Plant, Unit 1

Inspection at: Davis-Besse Site, Oak Harbor, OH

Inspection conducted: July 17-21, 1978

Inspector: L. R. Greger 8/7/78

Approved by: W. L. Fisher, Chief 8/7/78
Fuel Facility Projects and
Radiation Support Section

Inspection Summary

Inspection on July 17-21, 1978 (Report No. 50-346/78-18)
Areas Inspected: Routine, unannounced inspection of radioactive waste systems, including: effluent releases; records and reports of effluents; effluent control instrumentation; procedures for controlling releases; containment air-cleaning systems; reactor coolant water quality; solid radioactive waste; and licensee action on previous inspection findings. The inspection involved 42 inspector-hours on site by 1 NRC inspector.
Results: Of the eight areas inspected, no items of noncompliance or deviations were found in seven areas; one apparent item of noncompliance was found in one area (infraction - failure to perform safety evaluation - Paragraph 7).

DETAILS

1. Persons Contacted

C. Alm, Surveillance Engineer
*D. Briden, Chemist and Health Physicist
*J. Buck, Quality Assurance Supervisor
D. Eldred, I&C Coordinator
*T. Murray, Station Superintendent
*J. Nelson, Assistant I&C Engineer
*R. Scott, Chemistry and Radiochemistry Supervisor
L. Simon, Shift Foreman
J. Werner, Heating and Ventilation Specialist
J. Zell, Operations Support Engineer

The inspector also contacted several other licensee employees, including members of the technical and engineering staffs.

* Denotes those attending the exit interview.

2. General

This inspection, which began at 6:00 p.m. on July 17, 1978, was conducted to examine the licensee's radioactive waste program and related activities for compliance with regulatory requirements. The inspection included review of licensee records and reports, discussions with licensee personnel, and observation of plant activities by the inspector.

3. Licensee Audits

The inspector reviewed TECo Quality Assurance Audit Report #534, which included radwaste management activities (QAP 5220). The audit was conducted during June 1978. Corrective actions resulting from the audit had not been completed and will be reviewed during a future inspection.

4. Radioactive Liquid Effluent

The inspector selectively reviewed the licensee's Liquid Release Log and Liquid Release Permits for 1977 and the first six months of 1978. No releases exceeding the technical specification limits were identified. Liquid releases averaged less than 1% of the technical specification limits for concentrations and quantities of liquid radwastes. Quantification of liquid effluent consists of prerelease gross beta and gamma isotopic analyses and analyses of composite release samples for tritium, gross alpha, strontium-89, and strontium-90. No discrepancies from the technical specification surveillance requirements were identified. The licensee relies on

procedural controls to prevent exceeding the ten-curie technical specification limit in the radwaste monitor and detergent waste drain tanks.

The liquid radwaste treatment equipment has operated satisfactorily although the miscellaneous radwaste evaporator has experienced several pump failures. Radwaste releases to date have typically been less than one MPC before dilution with nonradioactive plant discharges. The MPC percentage is calculated based on isotopic and gross beta analyses. The gross beta results are used as a check on the isotopic derivations. An inconsistency in use of the gross beta results occurs due to differences in counting efficiencies for the identified nuclides. This item will be reviewed further during a future inspection. One release of 97,000 gallons of slightly tritiated water ($< 2E\text{-}5$ $\mu Ci/ml$) was made from the primary water storage tank, due to bladder repair work.

According to licensee records, a review of contaminated and noncontaminated plant water systems was conducted as requested in IE Circular No. 77-14. The licensee's review did not identify any problems regarding physical separation of contaminated and noncontaminated systems, nor were any problems which could lead to inadvertent contamination of the domestic water supply identified in the operating procedures.

No items of noncompliance or deviations were identified.

5. Radioactive Airborne Effluent

The inspector selectively reviewed the licensee's airborne gaseous, particulate, and iodine sampling and release records for 1977 and the first six months of 1978. No releases exceeding the technical specification limits were identified. Airborne releases were less than 1% of the technical specification limits. Gaseous releases are quantified from prerelease analyses of containment purge and waste gas decay tank batch releases and monthly release grab samples. Iodine and particulate releases are quantified from unit vent samplers. No discrepancies from the technical specification surveillance requirements were identified.

The gaseous radwaste treatment equipment has operated satisfactorily since startup. Waste gas decay tanks have typically been held for 30 to 50 days before release; only two releases through June 1978 contained identifiable noble gas activity. Waste gas decay tank activities are not routinely determined upon isolation of the tanks to ensure compliance with the 45,000 curie technical specification limit.

Modifications have been completed which provide redundant capabilties for collecting iodine and particulate samples of unit vent releases. This modification precludes loss of sampling capability due to a single sample pump failure.

No items of noncompliance or deviations were identified.

6. Effluent Reports

The inspector reviewed the licensee's semiannual radioactive effluent report for the period July 1, 1977 through December 31, 1977. Selective comparison of the reported radioactive effluents with the licensee's analysis records did not reveal any discrepancies.

The licensee did not report the percentage of the technical specification limit represented by the average liquid concentrations of fission and activation products released to unrestricted areas. This percentage was less than 0.1 for both quarters covered in the report. The licensee was requested to include the percentages of the technical specification effluent concentration limits in future reports.

No items of noncompliance or deviations were identified.

7. Effluent Control Instrumentation

Gaseous and liquid effluent and process monitor surveillance records for the period June 1977 through June 1978 were selectively reviewed for compliance with the technical specification requirements for operability, trip setpoints, calibrations, and testing. Except as noted below, no surveillance discrepancies were noted.

According to the licensee's records, calibrations were performed quarterly and functional tests monthly except for RE 744 (condensate demineralizer backwash pump discharge) and RE 1003A and B (condenser vacuum pump discharge). RE 1003A and B have been inoperable since mid-1977; RE 744 has been inoperable since late 1977. These monitors are designed to detect primary to secondary leakage in the steam generators. The licensee's FSAR, Section 11.4.2.2.7, states that RE 1003 continuously monitors the noncondensible gases from the condenser. According to licensee personnel, a safety evaluation has not been made to determine whether the prolonged inoperability of RE 1003 involves an unreviewed safety question. Such a review is required by 10 CFR 50.59(b).

The calibrations performed to date have utilized discrete sealed sources which were cross calibrated to liquid/gaseous standards by the supplier of the monitors. In addition to the use of the single point cross calibrations, linearity responses were determined during preoperational testing and are currently being conducted on a staggered basis designed to include all monitors once per eighteen months. The linearity checks were noted to cover the upper four

decades of monitor range. The lowest decade of usable monitor response is not included in the linearity checks. This item will be reviewed further during a future inspection. The licensee had agreed, during a previous inspection 1/, to perform fluid calibrations of the effluent monitoring following startup. The necessary equipment has been procured and the licensee intends to perform the fluid calibrations shortly.

Process and effluent monitors are equipped with either gamma or beta scintillation detectors. Scintillation detectors are not normally susceptible to saturation at high exposure rates with a resultant false downscale indication. Single channel analyzers are used in conjunction with charcoal adsorbers to provide airborne iodine-131 monitoring of the station vent stack and several ventilation systems. The monitors will also respond to noble gases with gamma energies greater than the I-131 photopeak (364 keV) due to temporary retention of the noble gases on the charcoal. The monitors can therefore give erroneous iodine-131 indications in the presence of noble gas activity. This matter was discussed with licensee personnel.

8. Procedures for Controlling Release

The inspector reviewed revisions to effluent control procedures for adherence to the licensee's procedural control system and for their effect on the licensee's radwaste management activities. The procedures included:

AD 1850.00	Radwaste Management
AD 1850.01	Radioactive Liquid Release
AD 1850.02	Solid Radioactive Waste Processing and Handling
AD 1850.03	Radioactive Gaseous Release

During the inspection, several required procedure additions/revisions were identified. These included: (1) calculation of actual liquid release rate for comparison against predicted release rate; (2) surveillance of waste gas decay tanks to ensure that activity is less than 45,000 curies per tank; (3) correction of liquid MPC's; (4) inclusion of linearity check with calibration procedures; and (5) clarification of frequencies and calibration techniques for process and effluent monitors.

No items of noncompliance or deviations were identified.

1/ IE Inspection Report 50-346/77-07.

9. Air Cleaning Systems

The inspector selectively reviewed the operability and surveillance records for the following ventilation systems: containment cooling, containment recirculation, containment hydrogen dilution, containment hydrogen purge, emergency ventilation, and control room emergency ventilation. No discrepancies from the technical specification requirements were identified.

Review of licensee records indicated that: (1) the containment purge supply and/or exhaust isolation valves were open for less than 20 hours during the preceding 365 days (in modes 1-4); (2) inplace HEPA (DOP) and charcoal (Freon) testing was last conducted during April 1978; and (3) laboratory testing of charcoal samples, conducted during April 1978, yielded satisfactory results. The inplace and laboratory test procedures were esentially unchanged from those examined during a previous inspection.[2/] A station Standing Order (24-2) was issued May 5, 1978 to address restrictions on painting, welding, and burning to prevent deterioration of the charcoal adsorbers installed in various ventilation systems.

No items of noncompliance or deviations were identified.

10. Reactor Coolant Water Quality

The inspector selectively reviewed licensee records for compliance with technical specification requirements for reactor coolant activity and radiochemistry surveillance.

Primary coolant activities typically have been less than 0.1% of the technical specification limits for both dose equivalent I-131 and gross activity. No radioiodine has been detected in the secondary coolant. No discrepancies from the radiochemistry surveillance requirements were identified.

No items of noncompliance or deviations were identified.

11. Solid Radioactive Waste

The licensee's installed radwaste solidification equipment does not operate satisfactorily and is not used to process radwaste. Instead, onsite contract solidification services are utilized. Three hundred cubic foot liners are used to collect radwaste evaporator bottoms. The contractor solidifies the radwaste in the 300-cubic-foot liners. Approximately two to three liners are processed per month. According to the licensee's records, approximately 500 mCi of processed radwaste were shipped to Barnwell, South Carolina for burial during the first six months of 1978;

2/ IE Inspection Report 50-346/77-12.

no shipments were made during 1977. All radwaste to date has been shipped as LSA material. In addition to the solidified radwaste, one DAW shipment was made during the first six months of 1978. Review of the licensee's records did not reveal any discrepancies from regulatory requirements.

No items of noncompliance or deviations were identified.

12. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 21, 1978, and further discussed the inspection findings with Mr. Murray by telephone on August 2, 1978. The inspector summarized the scope and findings of the inspection. In response to certain items discussed by the inspector, the licensee:

a. Agreed to review the use of gross beta analysis results in liquid effluent determinations. (Paragraph 4)

b. Stated that waste gas decay tanks would be sampled when isolated for decay to ensure that the maximum activity allowed by the technical specifications in one decay tank is not exceeded. (Paragraph 5)

c. Stated that future semiannual effluent reports would include the dilution water volumes both during actual releases and the total for the period and that the fraction of the technical specification concentration limit represented by the releases would also be reported. (Paragraph 6)

d. Acknowledged the noncompliance item and stated that delays in procuring replacement parts precipitated the extended down time for RE 1003; the repairs are expected to be completed in the near future. (Paragraph 7)

e. Stated that future effluent and process monitor calibrations would include linearity checks at an eighteen-month frequency and effluent monitors would be calibrated with a fluid standard at an eighteen-month frequency. (Paragraph 7)

f. Agreed to review the linearity check (effluent and process monitors) procedure to include an additional decade at the low end. (Paragraph 7)

g. Stated that although iodine monitors did not directly initiate evacuation alarms or scram signals, control room personnel would be informed of the potential for erroneous iodine-131 indications in the presence of noble gas activity. (Paragraph 7)

h. Acknowledged the inspector's admonishment to ensure that the requirements of 10 CFR 71 be met for shipment of Type B quantities of radioactive material. (Paragraph 11)