

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/92009(DRSS)

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 Station

Inspection At: Davis Besse Site, Oak Harbor, Ohio

Inspection Conducted: June 15-19, 1992

Inspector(s): *M. Schumacher for*  
R. A. Paul  
Senior Radiation Specialist

7/10/92  
Date

*Paul Shah*  
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Radiation Specialist

7/9/92  
Date

Approved By: *M. Schumacher*  
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Radiological Controls  
Section 1

7/10/92  
Date

Inspection Summary

Inspection on June 15-19, 1992 (Report Nos. 50-346/92009(DRSS))

Areas Inspected: Routine inspection of the licensee's radiation protection (RP) (IP 83750) and solid radwaste and transportation programs (IP 86750) including management controls and organization, audits and appraisals, training and qualifications and external exposure control. In addition, the results of two Potential Condition Adverse to Quality Reports (PCAQR) were reviewed.

Results: Overall the solid radwaste and transportation programs appear to be well implemented with continued emphasis on waste reduction (Section 8a). ALARA efforts included an ongoing evaluation of containment neutron dose sources (Section 7) and the use of a specially designed high integrity container (HIC) that helps reduce worker radiation exposure during fuel processing (Section 8a). Station and contract RP teams continue to meet ANSI N18.1-1971 requirements (Section 9). One deviation was identified (Section 9b) for failure to meet the requirements of a 10 CFR 50.59 safety evaluation review for the low level radwaste storage facility.

## DETAILS

### 1. Persons Contacted

+F. Lash, Manager Independent Safety Engineering  
+J. Priest, Associate Health Physicist  
+R. Greenwood, Senior Health Physicist  
+R. W. Schrauder, Manager Nuclear Licensing  
+B. Geddes, Supervisor Radiological Engineering  
+J. Polyak, Radiation Protection Manager  
+B. Andrews, Quality Assurance Inspector  
+G. Honma, Compliance Supervisor-Licensing  
+L. Harder, Senior Coordinator Radwaste/Shipping  
+L. Storz, Plant Manager  
+G. Gibbs, Manager Quality Assurance

+W. Levis, Senior Resident Inspector-NRC  
+R. K. Walton, Resident Inspector-NRC

+Attended the exit meeting on June 19, 1992.

The inspectors also interviewed other licensee personnel during the course of the inspection.

### 2. Licensee Action on Previous Inspection Findings (IP 92701)

(Open) Unresolved Item (50-346/91003-02): Performance of 10 CFR 50.59 safety analysis concerning continued reactor operation with broken turbine building sump discharge piping. This item remains open pending completion of a review by NRR.

### 3. Changes (IP 83750 and 86750)

The inspectors reviewed changes made since the last inspection in the organization, equipment, procedures, facilities, and implementation of the licensee's radiological protection program.

A modification to the radiological control organization occurred, with the general supervisor-radiation operations and the supervisors for radiation health, environmental controls, and ALARA planning/engineering now reporting to the radiation protection manager (RPM). In addition, a pending change is the transfer of the current general supervisor-radiation operations to operator training.

A number of facility improvements also occurred during this period, including: upgrading of the plant surrogate tour

program, instrument repair area, and respirator cleaning, storage and repair facilities; additionally, a new hot machine shop and portable demineralizer were installed to assist in contamination control activities.

No violations or deviations were identified.

4. Organization and Management Controls (IPs 83750 and 86750)

General oversight of the solid radioactive waste (radwaste) and transportation programs is exercised by the senior coordinator radwaste/shipping who reports to the general supervisor radiation operations; routine activities are managed by the supervisor-radwaste as directed by the senior coordinator. A dedicated staff of radwaste servicemen perform all processing and transportation activities with assistance from a RP master tester assigned to the group. The master tester also directs those RP testers periodically assigned to assist radwaste activities.

No violations or deviations were identified.

5. Audits and Appraisals (IP 83750 and 86750)

Quality assurance audits and surveillances issued since the last inspection were reviewed, found to be thorough, contained substantive findings and were resolved in a timely manner. Auditors appeared to have the appropriate expertise in the functional areas assessed and interviews with cognizant licensee personnel indicated a good working relationship existed between the radiation protection department and the quality assurance staff.

Several radiation awareness (RARs) and potential condition adverse to quality reports (PCAQRS) were also reviewed. Although not all were complete at the time of the inspection, the reports were generally well investigated with good root cause analyses and appropriate corrective actions taken. A discussion of specific PCAQRS is contained in Section 9.

The radiological assessor (RA), who is a board certified health physicist, continues to perform assessments independent of the station QA group. These audits are typically conservative, technically sound and routinely reviewed by the quality assurance director, plant manager and cognizant personnel in the radiation protection department. Resolution of issues is usually timely and demonstrated evidence of management involvement. A radiological assessor finding concerning effluent monitoring in the low level radwaste storage facility is discussed in Section 9b.

No violations or deviations were identified.

6. Training and Qualifications (IPs 83650 and 86750)

Through a review of records and interviews with the supervisor-radiological controls (training), the inspectors verified that both the senior coordinator radwaste/shipping and supervisor-radwaste (Section 5) had received documented training in NRC and DOT radioactive waste and transportation regulations. Although training records are reviewed by RP management, each individual is responsible for identifying training deficiencies to the training supervisor.

Radwaste servicemen are certified in accordance with the "Radiological Control Serviceman Qualification Manual" which consists of qualification cards covering individual radwaste activities. Successful completion of a qualification card is accomplished via a combination of classwork and on-the-job instruction by technical instructors and senior radwaste servicemen, respectively. Through a selective review of training records and interviews of radwaste servicemen, the inspector verified that the program was well implemented.

Training of contractor radiation protection technicians (CRPTs) continue as described in Inspection Report No. 50-345/91015(DRSS).

All radiation protection (RP) supervisors and both senior and master RP testers meet ANSI N18.1-1971 requirements, with the testers averaging about 4 years experience.

Licensee selection and verification of CRPTs are not covered procedurally, but there is written guidance for evaluating qualifications pursuant to American National Standards Institute (ANSI) N18.1, 1971 requirements and for defining what jobs should be performed by ANSI and non-ANSI qualified technicians. Selection is primarily based on a review of resumes and past performance at Davis Besse; telephone interviews with other utilities are infrequent. Stated experience and qualifications are verified through discussions with the on-site contract vendor representative; however, no formal verifications are performed nor does the licensee audit the vendor. Approximately 60 CRPTs are hired for each outage, most of whom are ANSI 18.1-1971 qualified seniors, with only a few assigned to difficult or higher dose jobs. The inspectors reviewed selected resumes of CRPTs hired for the most recent outage and noted that all appeared to meet or exceed ANSI-18.1-1971 requirements.

No violations or deviations were identified.

7. External Exposure Control and Personal Dosimetry (IP 83750)

Station dose for 1991 was about 205 person-rem which included a full refueling outage. For 1992, the station goal was about 20 person-rem (no scheduled outage) with approximately 14 person-rem accrued as of May 1992. About 7 person-rem was attributable to containment entries at power for leakage identification and containment air cooler cleaning. Most was from neutron exposure which is higher than normal owing to containment design limitations which inhibit use of additional shielding. Currently, all personnel entries receive ALARA reviews and radiation protection coverage. The licensee intends to perform a spectral analysis to determine neutron distribution for use in both dose assessment and shielding evaluations. This matter was discussed at the exit interview and will be reviewed as an Inspection Follow-up Item (IFI 50-346/92009-01).

No violations or deviations were identified

8. Implementation of the Solid Radioactive Waste and Transportation Programs. (IP 86750)

The inspectors reviewed the licensee's program for processing and shipping of solid radioactive waste and the low-level radioactive waste storage facility (LLRWSF). Activities appeared to be conducted as described in the Process Control Program and administrative procedure AD 1850.02 "Solid Radioactive Waste Processing and Handling".

a. Waste Generation and Processing

Primary waste streams include Dry Active Waste (DAW), solid mechanical filters and spent resin from the letdown, secondary (POWDEX) and liquid radwaste (DURATEK) processing systems.

In accordance with RCI-034-0 "Disposition of Radiological Restricted Area Waste Trash", DAW is segregated into contaminated or potentially clean trash, sorted for recyclable items and frisked prior to final packaging. Following the initial frisk, clean trash is resurveyed via a bag monitor prior to free release and contaminated trash is segregated by dose rate and sent to an offsite contractor for processing. Any activity identified in clean trash results in resorting and reassignment as contaminated trash.

Spent resins are dewatered onsite in high integrity containers (HICs) in accordance with a NRC topical report. All dewatered resins are shipped for burial

with the exception of POWDEX, which is sent to an offsite contractor for incineration and super-compaction.

Solid mechanical filters are also dewatered prior to burial; however, a specially designed HIC is used based on licensee identified ALARA concerns. Previously, filters were dried in air, sealed in a plastic bag and dropped into a regular HIC partially filled with water. The new HIC contains special channels for segregating filters by dose rate, provisions for dewatering and a higher water level to increase shielding and thereby reduce exposures to radwaste servicemen. While a long term evaluation is ongoing, exposures thus far appear lower.

Radwaste reduction efforts continued with the formation of a "Radwaste Reduction Committee", which reports to the ALARA committee, responsible for increasing station awareness of radwaste concerns. Specific goals of the committee include better control over liquid radwaste sources, greater reliance on recyclable items and increased waste segregation and decontamination efforts.

Another reduction initiative was an evaluation of an improved medium for the DURATEK system to increase removal of Cs-137 from the radwaste stream. While increased decontamination factors have been observed, further evaluation continues.

b. Waste Characterization, Packaging and Shipping

Approximately 3 shipments (363 ft<sup>3</sup>) of spent resin have been made to the burial sites, to date. Each shipment was recorded on a shipping log, reviewed by both health physics and quality control and had proper documentation. No shipping incidents have occurred since the previous inspection.

An extensive database of various radwaste correlation factors has been maintained by the licensee since 1988. Scaling factors are generated on an annual basis by a contract lab and compared to historical results with the most conservative factors used for shipping purposes. Scaling factors for the current year were reviewed by the inspector and compared to the historical database; no problems were identified.

Shipping papers are prepared and signed by the senior coordinator radwaste/shipping (section 3) using the RADMAN computer program. Total curie content for DAW

and filters are determined by RADMAN using a dose-to-curie conversion. Resin curie content is typically determined by directly scaling the isotopic activity in a measured sample to the shipment.

c. Interim Waste Storage

The inspectors' review of safety analysis reports and procedure DB-HP-01511 "Interim Onsite Low-Level Radioactive Waste Storage Facility" (LLRWSF) did not identify any problems regarding solid radwaste and shipping activities conducted in the LLRWSF.

Approximately 1050 ft<sup>3</sup> of DAW, 613 ft<sup>3</sup> of spent resin and 1 ft<sup>3</sup> of irradiated metal is stored in the LLRWSF awaiting shipment. Inventory is maintained via a computer program containing a short description of the waste contents, general location, responsible individual and surface dose rates.

No violations or deviations were identified.

9. Potential Condition Adverse to Quality Reports (PCAQR)

a. Particulate Activity Found in Personnel Shop Facility (PSF) HEPA Filters (PCAQR 92-0151)

During a routine filter change, an RP tester found low levels (about 2E-3 uCi/cc) of corrosion product activity on a prefilter in the ventilation system for the personnel shop facility (PSF). None was found on the downstream high efficiency particulate air filter (HEPA). PCAQR 92-0151 was written to document the incident and continuous air monitors (CAMs) were installed in the area.

The licensee attributes the filter activity to long term build up of residual activity from laundered protective clothing (PC) stored in the area. Except for two occasions where low levels of airborne corrosion product activity (1E-11 uCi/cc) were found in the PC storage area, no contamination has generally been identified during routine surveys. A licensee evaluation of the contamination source is still ongoing and will be reviewed as an Inspection Follow-up Item (JFI 50-346/92009-02).

b. Effluent Sampling of Low Level Radwaste Storage Facility (LLRWSF) Not In Accordance With Safety Analysis Review (PCAQR 92-0032)

A 10 CFR 50.59 safety evaluation report (SER), approved

July 2, 1986, for the construction of the LLRWSF specified installation of separate beta scintillator detectors to monitor effluent from both the waste sorting and cell storage areas. However, monitor installation had not been completed when the facility entered service in 1988 and a subsequent SER dated March 31, 1988, was written to allow use of the facility with specific compensatory controls. These included routine surveys and air samples, constant air monitors, and radiation work permits (RWP).

In an audit dated January 28, 1992, the radiological assessor (Section 5) identified that when the monitors were completed in 1989, a Geiger Mueller (GM) detector had been installed for the waste sorting area monitor rather than the SER prescribed beta scintillator. A licensee followup investigation (documented in PCAQR 92-0032 dated 2/10/92) verified the assessor's finding. The inspectors also learned from licensee representatives that neither monitor had been calibrated since their installation but that undocumented routine source checks were being done. Neither licensee procedures nor the SERs specified tests or calibrations after installation.

The failure to install the SER prescribed detector on the waste sorting area effluent monitor is considered a deviation from a licensee commitment (DEV 50-346/92009-03). Licensee short term corrective actions included a new procedure DB-HP-06028, "Radwaste Building Monitoring System" which formalized monitor functional tests and issuance of a departmental memorandum dated March 24, 1992, summarizing radiological controls to be exercised in the LLRWSF. The facility continues to operate under these controls while the monitors are currently declared inoperable pending management action on a request to replace the detector on the sorting area monitor. No response will be required to this deviation but the inspectors will review licensee progress on this matter during subsequent inspections.

One deviation was identified

10. Control of Radioactive Materials and Contamination, Surveys and Monitoring (IP 83750)

The inspectors reviewed licensee efforts towards clean up of a contaminated water spill near the "B" waste storage tank (BWST) described in Inspection Report 50-346/92018(DRP). Approximately 570 ft<sup>3</sup> of soil was removed and shipped to an offsite contractor and the affected area was posted contaminated. Analysis of water samples from preexisting wells indicated only tritium activity (1300-3100 pCi/L) as originating from the plant. The wells had not been

previously sampled for radioactivity. A small amount of soil with low levels of contamination (28-32 pCi/g) remains in the area and will be disposed of in concordance with previously identified contaminated soil (Open Item 50-346/91003-03). This item will be reviewed by the inspectors in future inspections (IFI 50-346/92009-04).

No violations or deviations were identified

11. Plant Tours

During a general tour of the plant radiological controlled areas (RCA), the inspector did not identify any problems regarding plant housekeeping or radiological controls. Work areas were typically well maintained and no problems were noted during observations of workers.

No violations or deviations were identified.

12. Inspection Follow-up Items

Inspection follow-up items (IFI) are matters which have been discussed with the licensee, will be reviewed further by the inspector and which involve some action on the part of the NRC, licensee or both. Inspection follow-up items disclosed during the inspection are discussed in Sections 7, 9 and 10.

13. Exit Interview

The scope and findings of the inspection were reviewed with licensee representatives (Section 1) at the conclusion of the inspection on June 19, 1992. The licensee did not identify any documents as proprietary. The following matters were specifically discussed by the inspectors:

- a. Status of contaminated soil (Sections 2 and 10)
- b. Facility changes and modifications (Section 3)
- c. Analysis of neutron exposure in containment (Section 7)
- d. Radwaste reduction initiatives and new filter HIC (Section 8a)
- e. PCAQRs 92-0151 and 92-0032 (Section 9)