

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/88016(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 13-17, 1988

*D. E. Miller*  
Inspectors: D. E. Miller

7/7/88  
Date

*M. A. Kunowski*  
M. A. Kunowski

7/8/88  
Date

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

7/7/88  
Date

Inspection Summary:

Inspection on June 13-17, 1988 (Report No. 50-346/88016(DRSS))

Areas Inspected: Routine unannounced inspection of the outage radiation protection and operational radwaste management programs, including; organizational changes, management controls, training and qualifications (IP 83729); external and internal exposure controls (IP 83729); control of radioactive materials and contamination (IP 83729); ALARA (IP 83729); gaseous radwaste (IP 84724); liquid radwaste (IP 84723); transportation (IP 86721); and audits (IP 83729). Also reviewed were past inspection items and selected NRC Information Notices.

Results: The licensee's radiation protection and radwaste management programs appear well managed and implemented and include good methods of self-identification and correction of programmatic weaknesses. Additional station attention appears needed to ensure adequate pre-outage job planning and coordination. No violations or deviations were identified.

## DETAILS

### 1. Persons Contacted

L. Bonker, Radiological Health Supervisor  
N. Bonner, Assistant Plant Manager, Maintenance  
R. Coad, Radiological Protection Supervisor  
D. Erickson, Radiological Control Superintendent  
L. Harder, Radiological Control Supervisor  
G. Honma, Compliance Supervisor, Nuclear Licensing  
S. Jain, Director, Independent Safety Engineering (ISE)  
J. Polyak, Radiological Assessment Manager, ISE  
L. Ramsett, Quality Assurance Director  
E. Salowitz, General Superintendent, Outage and Program Management  
R. Schrauder, Nuclear Licensing Manager  
L. Storz, Plant Manager  
J. Sturdavant, Licensing Principal  
  
P. Byron, NRC Senior Resident Inspector

The above individuals attended the exit meeting on June 17, 1988. In addition to the above individuals, the inspectors contacted other licensee and contractor personnel.

### 2. General

This inspection, which began on June 13, 1988, was conducted to review portions of the licensee's outage radiation protection, and operational radwaste and transportation programs. Also reviewed were past open and unresolved items, selected Licensee Event Reports, and a selected NRC Information Notice. Several tours of licensee facilities were made to observe posting, labeling, and access and contamination controls; no significant problems were noted.

### 3. Licensee Action on Previous Open Items and a Selected NRC Information Notice

(Closed) Open Item (346/87021-01): Liquid radwaste release forms are not always complete. The licensee assigned review responsibility to an individual who assures that forms are completed. No further problems were noted.

(Closed) Open Item (346/87021-02): Need more accurate quantifications of containment pressure relief releases. The procedure change which includes an improved quantification method is in the final review process. Also, the license is considering installation of a flow measuring device in the release pathway.

(Closed) Open Item (346/88098-05): The Radiological Assessment Manager (RAM) is housed adjacent to the RC superintendent; this could affect employee interactions with the RAM. The RAM is being relocated to an office not in close proximity to the RC department.

(Open) Unresolved Item (346/88008-01): Evaluate dose assignment methodology to show compliance with Form NRC-5. The licensee has completed their evaluation and has forwarded it to the NRC for review.

As described below, the licensee made an adequate review of a selected NRC Information Notice.

Notice No. 87-32: Deficiencies in the Testing of Nuclear - Grade Activated Charcoal. The licensee uses one of the two vendors who satisfied the requirements of the interlaboratory comparison conducted for the NRC by the Idaho National Engineering Laboratory.

4. Radiological Control Organization, Changes, Management Controls, Training, and Qualifications (IP 83729)

There have been no significant changes in these subject areas since the team inspection conducted during February and March 1988 (see Inspection Report No. 50-346/88008(DRSS)).

During this inspection, the inspectors reviewed the licensee's compliance with Generic Letter No. 82-12, Nuclear Power Plant Staff Working Hours; specifically reviewed was hours being worked by health physics testers (technicians). The licensee routinely limits hours worked by testers to sixty hours per week. Any work in excess of sixty hours must be authorized by the Plant Manager; this authorization is seldom used/necessary. The licensee is in compliance with the generic letter regarding hours worked by health physics testers.

No violations or deviations were identified.

5. External Exposure Control (IP 83729)

The inspectors reviewed the licensee's external exposure control and personal dosimetry programs, including: changes in program to meet outage needs; use of dosimetry to determine whether requirements are met; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

The licensee's external exposure controls program was extensively reviewed during the team inspection conducted during February and March 1988 and described in Inspection Report No. 50-346/88008(DRSS). No significant programmatic changes have since been made.

Noted in reactor operator examiners' Report No. 346/OL-88-01 was an observation that plant personnel fail to follow Procedure No. HP 1601.03.11, Radiation Work Permits (RWPs), which requires each worker exiting the radiologically controlled area (RCA) to read his/her Self-Reading Dosimeter (SRD) and to track his/her exposure on a pocket card; instead, persons were reported to be depositing their SRD in a box (frequently without reading the SRD) and not recording the SRD reading on their pocket card. This matter was reviewed during this inspection. The inspectors noted that Procedure No. HP 1601.03.11 was in the final stages of revision, and that a temporary change to the procedure was

accomplished by informational postings in the access control area. Under the revised procedure, dosimetry clerks read the SRD and enter the reading in a computer record. It is intended that the person exiting the RCA read his/her SRD before depositing the SRD at the dosimetry clerk's counter only for their own information. The licensee plans to make available separate pocket cards for exiting persons who wish to maintain a personal record; however, such records would be optional. The computer record is called up on the computer each time an individual obtains an SRD before entering the RCA and the record is updated upon the individual's exit. Included in the computer record is the RWP number under which the entry is made. The inspectors consider the new system to be an improvement because the variability experienced when persons read their own SRD is reduced, and there is better assurance that all SRD readings are entered into dose records. The final procedure will reflect the present field implementation change. No problems were noted.

Personnel doses for the outage months of March and April totaled 62.2 person-rem, which is above the licensee's projection. According to the licensee, pre-outage dose estimates for planned major work items have been fairly accurate; the unanticipated dose results from extensive support activities in low dose rate areas that were underestimated when projecting outage dose. The doses do not appear inordinately high for the extent of work being performed in the RCA.

No violations or deviations were identified.

6. Internal Exposure Control (IP 83729)

The inspectors reviewed the licensee's internal exposure control and assessment programs, including: changes to procedures affecting internal exposure control and personal assessment; determination whether engineering controls, respiratory equipment, and assessment of individual intakes meet regulatory requirements; planning and preparation for maintenance and refueling tasks including ALARA considerations; and required records, reports, and notifications.

The licensee's internal exposure controls program was extensively reviewed during the team inspection conducted during February and March 1988 and described in Inspection Report No. 50-346/88008(PRSS). No significant programmatic changes have since been made.

The inspectors selectively reviewed whole body counting results for the period March through May 1988. No intakes in excess of the 40 MPC-hour control measure were noted. Based on whole body counting and tritium urinalysis results, there is no indication of weaknesses in the licensee's internal exposure control and assessment program.

No violations or deviations were identified.

7. Control of Radioactive Materials and Contamination (IP 83729)

The inspectors reviewed the licensee's program for control of radioactive materials and contamination, including: adequacy of supply, maintenance, and calibration of contamination survey and monitoring equipment;

effectiveness of survey methods, practices, equipment and procedures; adequacy of review and dissemination of survey data; and effectiveness of methods of control of radioactive and contaminated materials.

The licensee's program for control of radioactive materials and contamination is discussed in Inspection Report No. 50-346/88008(DRSS). The new automated laundry monitor discussed in the report was being calibrated during this inspection.

During RCA tours, the inspectors observed: work performed under radiation work permits; protective clothing use, handling, and cleaning; frisking; hot particle detection methods; and tool decontamination, handling, and storage. No significant problems were noted.

Ninety-seven personal contamination events have been recorded during 1988 through May; 52 of these events were recorded during May with 27 being clothing and 25 being skin contaminations. The licensee attributes half of the large increase in the number of events to poor work practices during reactor head work and during valve work on ECCS 1-2 and the Decay Heat Removal System, and to the large number of personnel onsite who have little or no previous nuclear work experience. The inspectors discussed with the licensee during the inspection and at the exit meeting the desirability of providing practical radiation protection training to incoming radiation workers with little or no previous nuclear work experience.

During the licensee's followup and review of the personal contamination incidents that occurred in May, the licensee noted that half of the incidents occurred during the period midnight to 6:00 a.m.; no firm conclusion was drawn from this information.

No violations or deviations were identified.

#### 8. ALARA (IP 83729)

The licensee's ALARA program was reviewed during a special NRC health physics team inspection just prior to the start of the current refueling/maintenance outage (see Inspection Report No. 50-346/88008(DRSS)). During this inspection the inspectors noted that the licensee has made significant progress in strengthening and formalizing the ALARA program. The three contractors working in the ALARA group have developed extensive job history files which include photographs, videos, and records of pre-job briefings and post-job critiques. They have also compiled vendor/equipment catalogues and formulated recommendations for improvements in the quality of job packages presented for ALARA review, time allowed for ALARA reviews, scheduling of outage work, and ALARA techniques such as use of remote operators and strippable paint. The recommendations, a planned ALARA outage report, and the job history files, if properly used, should ensure a strong ALARA program. There were also indications that although most of the pre-job briefings and post-job critiques had been performed by the contractors, there has been some participation by the licensee's permanent radiation protection staff, especially at the technician and foreman level.

The inspectors reviewed aspects of several outage jobs. The licensee replaced several incore detectors and a pressurizer heater; licensee representatives and the job history files indicated that both jobs went smoothly and resulted in lower total dose than anticipated. Because of the success of the incore job, the licensee printed a photograph and article in the station newsletter to highlight the accomplishments of the craft workers involved in the job and to give some positive publicity to the station's ALARA efforts. The inspectors also reviewed an outage job that apparently did not go smoothly, although the resultant dose total was close to the original estimate. The licensee replaced four control valves, two on each loop, on the Decay Heat Removal System because the existing valves and operators required frequent maintenance and repair. Previous maintenance and repairs apparently had been difficult and time-consuming because of the cramped working area and the valves were weld-end valves not flanged. Problems were encountered during the initial work on one of the loops, including missing or inaccurate reports and drawings, inadequate system isolation, faulty relays, and poor logistics for installation of scaffolding, tents and lead shielding. Most of the problems encountered on the first loop were addressed at a post-job critique and were not encountered during work on the second loop. Licensee representatives stated, however, that two of the new valves, one on each loop, were inappropriate for the system and were replaced with different valves. The inspectors also noted other instances where systems had not been isolated before work was started on associated valves. Fortunately, these instances did not result in any personal contaminations. However, they indicate the need for the station to review its system isolation/tagging out procedure and procedure implementation. Noted pre-outage and pre-job problems were discussed at the exit meeting.

As of mid-June 1988, the licensee had accumulated approximately 190 person-rem for the outage, compared to a goal for the entire outage of 160 person-rem. Licensee representatives attributed the higher than anticipated dose totals to accumulating more dose than planned on routine, low-dose jobs (those not subject to an ALARA review) and having to expand the scope of certain higher dose jobs after the start of the originally planned work; for example, initially, repairs were slated for eight control rod drive mechanisms (CRDMs), but after work had begun on the reactor head at start of the outage, the licensee determined that 24 other CRDMs had to be removed, repaired, and reinstalled.

No violations or deviations were identified.

9. Liquid Radioactive Wastes (IP 84723)

The inspectors reviewed the licensee's liquid radwaste management programs, including: determination whether changes to equipment and procedures were in accordance with 10 CFR 50.59; determination whether liquid radioactive waste effluents were in accordance with regulatory requirements; adequacy of required records, reports, and notifications; and experience concerning identification and correction of programmatic weaknesses.

The inspectors selectively reviewed records of planned liquid release sampling, analysis, quantification, and release control for 1988 to date. No deviations from 10 CFR 20, technical specification, or ODCM requirements were noted. Corrective actions for a previously identified problem concerning incomplete release documentation are discussed in Section 3. Effluent monitor maintenance and secondary calibrations were reviewed; no problems were noted. Primary calibration and secondary/primary interface will be reviewed during a future inspection.

No violations or deviations were identified.

10. Gaseous Radioactive Waste (IP 84724)

The inspectors reviewed the licensee's gaseous radwaste management program, including: determination whether changes to equipment and procedures were in accordance with 10 CFR 50.59; determination whether gaseous radioactive waste effluents were in accordance with regulatory requirements; adequacy of required records, reports, and notifications; and experience concerning identification and correction of programmatic weaknesses.

The inspectors cursorily reviewed radioisotopic quantification records for containment vessel purges and pressure reliefs, gas decay tank releases, and continuous releases via the reactor building vent. A previously identified problem concerning containment pressure relief release quantifications is discussed in Section 3. Previously identified problems concerning energy response of the PASS noble gas high range detector, and the stack sample return line, are discussed in Section 3 of Inspection Report No. 50-346/88008(DRSS); a facility change is scheduled for implementation during July 1988 to correct the problems. No additional problems were identified during this inspection. Sampling and analysis meets technical specification requirements and quantification methods appear appropriate.

No violations or deviations were identified.

11. Transportation of Radioactive Materials (IP 86721)

The inspectors reviewed the licensee's transportation of radioactive materials program, including: determination whether written implementing procedures are adequate, maintained current, properly approved, and acceptably implemented; determination whether shipments are in compliance with NRC and DOT regulations and the licensee's quality assurance program; adequacy of required records, reports, shipment documentation, and notifications; and experience concerning identification and correction of programmatic weaknesses.

The inspectors selectively reviewed records of radioactive material shipments including radwaste, laboratory samples, and irradiated/contaminated hardware. The shipments appear to have been made in accordance with NRC and licensee procedural requirements. A review of the licensee's main implementing procedure for shipping radioactive

material, Procedure No. RW-4600.00 (DB-HP-01500), indicated several discrepancies between the procedure and 49 CFR 172.403 and 173.403(bb) for dose rate limits at the surface of a package and at 1 meter from the package surface. The licensee was made aware of the discrepancies and agreed to correct the procedure. No violations of DOT requirements resulted from the procedural discrepancies.

The inspectors also reviewed the licensee's evaluation and documentation of tests made to satisfy 49 CFR 173.415(a). This regulation requires each shipper of a Specification 7A package to maintain on file a complete documentation of tests and an engineering evaluation or comparative data showing that the construction methods, packaging design, and materials of construction comply with the specification. The licensee, through a consultant, determined that MLM-3245, DOE Evaluation Document for DOT 7A Type A Packaging, March 1987, provides the required test documentation for the four packagings frequently used at Davis-Besse. In addition, the licensee is using the consultant's report and shipment-specific documentation to satisfy the engineering evaluation requirement of Section 173.415(a) and other requirements in Sections 172-173. The inspectors noted that the consultant suggested that the licensee modify its procedures to incorporate tables and checklists to ensure that use of the packagings continues to be made in accordance with the packaging evaluations. To date in 1988, the licensee has shipped one package of a Type A quantity of radioactive material; as with other stations, most shipments involve LSA or limited quantity.

No violations or deviations were identified.

12. Audit (IP 83729)

The inspectors reviewed the results of a station Quality Assurance Audit of the radiation control program conducted during May 1988. The Audit was performed by station QA Auditors and contracted specialists; four findings resulted from the Audit. The findings concerned:

- Incomplete postings, mainly on access doors to the new radwaste storage facility.
- Contamination survey sample counting discrepancies.
- Use of improper respiratory protection regulator fittings.
- Radioactive materials identification discrepancies.

The findings mainly resulted from failure to fully comply with written health physics procedures. Internal responses to the findings were not completed, and thus were not available for review during this inspection. Corrective actions will be reviewed during a future inspection. (Open Item 346/88016-01)

No violations or deviations were identified.

13. Exit Meeting

The inspectors met with licensee representatives (denoted in Section 1) at the conclusion of the inspection on June 17, 1988, to discuss the scope of the inspection and the findings. The inspectors also discussed the likely informational content of the inspection report with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents/processes as proprietary. In response to certain matters discussed by the inspectors, the licensee:

- a. Acknowledged the inspectors' comment about the desirability of providing practical radiation protection training to new radiation workers. (Section 7)
- b. Acknowledged the inspectors' comment concerning the apparent need to assure adequate pre-job planning and coordination for all significant radiological work. (Section 8)