

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-346/90020(DRSS)
22

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: November 13-16, 1990

M. Schumacher
for
Inspector: R. A. Paul

12-12-90
Date

M. Schumacher
Approved By: M. C. Schumacher, Chief
Radiological Controls and
Chemistry Section

12-12-90
Date

Inspection Summary

Inspection on November 13-16, 1990 (Report No. 50-346/90020(DRSS))
22

Areas Inspected: Routine unannounced inspection of the licensee's radiation protection program, including organization and management controls (IP 83750); external and internal exposure controls (IP 83750); training and qualifications (IP 83750); radiological controls IP 83750); radiation occurrence reports (IP 83750); and plant tours.

Results: Licensee personnel allowed three events to occur which resulted in personal intakes of radioactive material. These events were due to personnel error because of poor communication, and pre-job planning, and insufficient radiation protection technician job experience (Section 11).

DETAILS

1. Persons Contacted

- *B. Andrews, Quality Assurance
- *W. Haney, Radiological Engineer
- *G. Hanna, Compliance Supervisor-Licensing
- *J. Lash, Manager ISE
- *T. O'Dou, Radiological Assessor
- *N. Peterson, Licensing Engineer
- *J. Polyak, Manager, Radiological Controls
L. Storz, Plant Manager
- *P. Strahm, Supervisor, Radiological Operations

- *R. Walton, Resident Inspector

The inspector also interviewed other licensee personnel in various departments in the course of the inspection.

*Denotes those present at the plant exit interview on November 16, 1990.

2. General

This inspection was conducted to review the licensee's radiation protection program. The inspectors toured licensee facilities to review posting, labeling, and access controls and to perform independent surveys.

3. Licensee Action on Previous Inspection Findings (IP 92701)

(Closed) Open Item (346/90004-01): Release limits for disposal of material. The licensee has changed its unconditional release procedures to indicate no material can be released from the station if the material reads above background using a hand held frisker.

4. Organization, Management Controls, and Staffing (IP 83750)

The inspector reviewed the licensee's organization and management controls for radiation protection, including changes in the organizational structure and staffing and effectiveness of procedures and other management techniques used to implement the program.

The licensee modified its radiological control organization since the previous inspection (IR 346/90004) by reducing the number of general supervisors reporting directly to the Radiation Control Manager (RPM), to two (Radiological Operations and Radiological Support). Supervisors for Radiological Controls and for Radwaste report to the General Supervisor Operations; Supervisors for Radiological Health, Radiological Environmental Compliance, and Radiological Engineering/ALARA (new position since previous inspection) report to the General Supervisor Radiological Support. The organization is well staffed with professional health physicists including one certified by the American Boards of Health Physics. Another board certified HP was transferred to the

corporate staff to perform audit functions. All Senior Radiation Control (RC) Testers (technicians), Health Physics Testers, and HP supervisors meet the ANSI N18.1-1971 requirements. Although the average experience level of the HP Testers continues to improve, it is still somewhat low (3-4 years). Experience in the tester group was also diminished somewhat with the transfer of two seniors to the ALARA group and to training and the resignation of a third.

No violations and deviations were identified.

5. Training and Qualification (IP 83750)

The inspector reviewed selected aspects of the licensee's radiological control personnel training program including: policies, goals and methods; and course content and applicability. An examination of training records and interviews with the supervisor for Radiological Control Workers Training was also performed.

All permanent personnel performing radiological activities receive initial and recurring training covering radiation protection theory, techniques, and equipment, radiation hazards, and licensee procedures and policies. On the job training and a power plant fundamentals course is also required. Training appears to be adequate and accomplished in accordance with Nuclear Training Procedure "Training and Qualification of Radiological Control Personnel". The training material offered in the power plant fundamentals course and selected training documentation of control testers who have completed the course were reviewed. The course appears comprehensive in nature and adequate to meet the requirements of the health physics department. Training records indicate that control testers who have not received the training are currently scheduled for attendance.

No violations or deviations were identified.

6. External Exposure Control (IP 83750)

The inspector reviewed the adequacy of the licensee's external exposure control and personnel dosimetry programs including: adequacy of the program to meet routine needs; records, reports, and notifications; and management review and program implementation.

The licensee uses a NAVLAP certified vendor (Categories I-VIII) TLD personal dosimetry system. The inspector reviewed the contractor TLD QA program, calibration procedures, and TLD dosimeter QC; no problems were noted. TLDs used at the station have the capability of detecting beta, gamma and neutron exposure. The neutron component is not routinely reported but the raw data are available and neutron exposures can be calculated if necessary using an appropriate algorithm.

TLDs and SRDs continue to be issued at the RCA entrance. SRDs are issued by clerks who read and record the initial dosimeter reading, the individual's social security number, and the RWP number under which the person is entering the RCA. Upon exit from the RCA, the clerk reads and

records the SRD reading. The practice of a clerk recording SRD readings significantly reduces disagreements between TLD and SRD results.

The inspector selectively reviewed RWP's, associated radiation surveys, management involvement and oversight of radiation protection activities, posting and control, and observed radiological control practices. All radiation and high radiation areas (HRAs) inspected appeared to be posted and controlled in accordance with regulatory requirements.

The 1989 total cumulative dose (no outage) was about 38 person-rem. The 1990 total through October was about 485 person-rem; about 460 person-rem of which was accumulated during the spring outage. The initial station goal of about 180 person-rem was revised to about 500 person-rem mainly because it did not reflect the full work scope of the outage and emergent work.

No violations or deviations were identified.

7. Internal Exposure Control (IP 83750)

The inspector reviewed selected aspects of the licensee's internal exposure control and assessment programs, including use of engineering controls, respiratory equipment, and whole body and air sampling counting equipment.

Whole body and bioassay (urinalysis) count results for 1990 indicated no results exceeding the 40 MPC-hour control measure. The inspector selectively reviewed relevant whole body count and calibration procedures, the whole body count facilities, whole body count results from several personal intakes which occurred in 1990, whole body count methodology to determine MPC-hours, recent calibration results, and spoke to control testers performing the whole body count equipment and cognizant health physics personnel. No significant problems were identified.

It appears air samples are taken, counted, and evaluated in accordance with procedural requirements. Engineering controls to prevent potential airborne and surface contamination includes air blowing equipment and work enclosures to augment the building ventilation. Based on survey and air sample data it appears use of these controls are effective.

No violations or deviations were identified.

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

The inspector reviewed the licensee's program for control of radioactive materials and contamination including: calibration and source checks of contamination survey and monitoring equipment, and effectiveness of methods of control of radioactive and contaminated materials.

Through October 1990, there were about 150 personal contamination and hot particle events, with most occurring during the spring outage; all were investigated. The licensee's investigations of these events and its program for dose assessment appears satisfactory.

Licensee personnel demonstrated to the inspector their ability to compute skin dose for hypothetical hot particle situations involving different radioisotopes. Their calculations of dose at 7mg/cm² were in good agreement with NRC calculations. The licensee stated that the VARSKIN computer code program will be used in future dose assessments.

Areas in the RCA that are posted and controlled as contaminated represent about 5% of the total area, which is at or about the projected goal. This is significantly less than the area controlled during the spring outage (about 20%). It appears licensee efforts to maintain minimum areas in the RCA as controlled have been effective.

The inspector reviewed monitor alarm setpoint methodology, functional tests and calibration procedures for the gas flow RCA exit friskers, and the tool and laundry monitors. Although there were no concerns raised regarding the calibration source certificate activity levels or the calibration methods used on these instruments, it was noted that the QC source check used for daily alarm set points for the whole body friskers was considerably greater than the trip point setting. The licensee stated that until recently the daily set point check was a very time consuming process done with a nominal 2.5 nanocurie check source which is equivalent to the value used for the trip set point (5000 dpm/100cm²). They stated that the results over several years have indicated that the instrument either alarms at the set value or defaults to alarm at the maximum sensitivity. This matter was discussed with the licensee who agreed to confirm the set point quarterly with the 2.5 nanocurie source in addition to using the current check source daily (Open Item 346/90020-02)

There were no violations of deviations identified.

9. Maintaining Occupational Exposure ALARA (IP 83750)

Since the previous inspection (Inspection Report No. 346/90004), the licensee has created a station ALARA planning group which involves ALARA trained/oriented personnel in the broad base planning phases of station work and is in the process of developing a station ALARA committee. Other developments include formalizing the ALARA group in the radiation control organization initiating ALARA training for design engineers, and initiating programs to reduce and control radiation source terms. The activities include control system, water chemistry, decontamination, and improved control on operations. The effectiveness of these efforts will be reviewed by the inspector.

The ALARA staff appear to be qualified and receives management support; ALARA is factored into work activities, there is sufficient ALARA pre and post job review, and lessons learned are used for future work.

10. Audit and Appraisals (83750)

The inspector reviewed selected aspects of QA audit AR-90-RADPR-01 performed between March 23 through April 3, 1990, Quality Assurance Surveillance Report SR-90-PLOPS-19, and three audits performed by the

Senior Radiological Assessor. It appears the licensee's QA audit/surveillance program is strong and is able to adequately assess the technical and regulatory performance of the Radiation Protection Department. The QA auditors assigned to this functional area appear to be well qualified and the group has been recently strengthened by the transfer in of a certified health physicist from the Radiological Control Organization. The reports reflect performance based audits when appropriate, and in most cases the responses are sufficient. One problem identified in a few of the audits concerned inadequacies in the RWP program; the licensee is currently addressing the problems.

No violations or deviations were identified.

11. Potential Condition Adverse To Quality Reports (PCAQR) (IP 93702)

The inspector reviewed selected PCAQR and Radiation Awareness reports (RARs) concerning identified radiological control problems generated during 1990 to date, to determine if programmatic problems exist and if deficiencies were promptly and adequately corrected. During this period, the licensee identified about thirteen incidents involving radiological controls, six in which spread of contamination and personal contaminations occurred, three involving HRA controls and posting, and others involving administrative control problems. No personal dose limits were exceeded and in each case the inspector verified the licensee's dose assessment. The PCAQRs were generally well investigated and timely and in most cases, there was a good root cause analyses performed and corrective actions appeared adequate. The licensee also issued a Management Corrective Action Report (MCAR) to address the problems and weaknesses raised in the PCAQRs. Examples of events whose root and secondary cause involved RC tester training and qualifications, communication and poor planning between radiation protection and other work groups are delineated as follows:

PCAQR/RAR	Occurrence Date	Description
90-0675	10-22-90	Handling of contaminated equipment not identified by survey and working under an inappropriate RWP resulted in personal radioactive intakes.
90-067	05-11-90	Inadequate evaluation of radiological conditions in the refueling cavity resulted in elevated airborne contamination and personal radioactive intakes.
90-052	04-09-90	Poor work practices used during a milling operation and failure to recognize changing radiological conditions resulted in apparent elevated airborne contamination and personal intakes.

90-0115	02-14-90	Inadequate surveys to identify HRAs beneath the reactor vessel flange resulting in incorrect posting and control of the area.
90-0190	03-11-90	Worker entry into a HRA without required personnel monitoring and continuous health physics coverage.

Although these events differ in detail, they appear to have similarities such as poor or incomplete communication between or within work groups, poor prejob planning, and failure of RC technicians to recognize potentially significant radiological conditions. As noted above, corrective actions for each, taken narrowly, appeared to be adequate. However, the recurrence of similar events suggests the possible existence of more pervasive root causes such as RC technician inexperience or the need for additional supervision. This matter was discussed at the exit interview and will be further reviewed during future inspections. (Open Item 346/90020-01).

12. Exit Interview

The scope and findings of the inspection were discussed with licensee representatives (Section 1) at the conclusion of the inspection on October 16, 1990. The inspector specifically discussed the problems noted in various PCAQR/RARs, and discussed some of the weaknesses in the radiological control program which led to those reports. The licensee acknowledged the inspectors' comments. Licensee representatives did not identify any documents or processes reviewed during the inspection as proprietary.