U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-346
License No:	NPF-3
Report No:	50-346/96013(DRS)
Licensee:	Toledo Edison Company
Facility:	Davis-Besse Nuclear Power Station
Location:	5503 N. State Rte. 2 Oak Harbor, OH 43449
Dates:	December 2, 1996 through January 17, 1997
Inspector:	Kara N. Selburg, Radiation Specialist
Accompanying Staff:	Ronald A. Burrows, Radiation Specialist
Observing:	Ronald Goodwin, Health Physicist Ohio Department of Health
Approved by:	Thomas J. Kozak, Chief, Plant Support Branch 2 Division of Reactor Safety

Report Details

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Radiation Monitors

a. Inspection Scope (84750)

The inspectors performed a review of the radiation monitoring program. This included an inspection of numerous effluent and area radiation monitors, and an inspection of the radiation monitor panel in the control room. The inspectors observed an Instrument and Controls (I&C) technician perform a portion of a radiation monitor calibration in the control room. The inspectors also reviewed the setpoint methodologies performed by radiation protection (RP) and chemistry personnel, and reviewed the operability of the radiation monitors over the past several months.

b. Observations and Findings

An inspection of several radiation monitors indicated that they were in good material condition, with few monitors out of service. The inspectors noted that the indicator lights on several area radiation monitors were not illuminated. Through discussions with the system engineer, it was determined that these lights would not be illuminated at a range below detectability or when the light bulb was burned out. The licensee performs a weekly survey of the radiation monitors which addresses this problem. The inspectors observed two I&C technicians working on radiation monitors, one performing a calibration, and the other performing maintenance. The technicians were knowledgeable of the systems, and the work to be completed.

The inspectors reviewed the radiation monitor setpoint methodologies with RP and chemistry staff. RP performed the setpoint calculations for area radiation monitors and gaseous effluent radiation monitors. Chemistry performed setpoint calculations for effluent radiation monitors prior to a liquid batch release. No problems were noted with the setpoint methodologies. During the review of the RP procedure governing setpoint calculations, the inspectors noted that the procedure requires an annual review of all setpoints. However, licensee personnel responsible for setpoint calculations were unaware of this requirement and, had it not been brought to their attention by the inspector, it is likely that the annual review would have been missed. The review was subsequently completed prior to the procedural deadline. This review found that the failed fuel detector (RE 1998) needed to be recalculated to a lower alert setpoint due to a decrease in the background radiation area; no other changes were necessary. The inspectors reviewed the setpoint calculation and found no problems. The licensee placed the annual review of the setpoint calculations into an internal RP tracking system.

c. Conclusion

Overall, the material condition and availability of the radiation monitors was good. However, some problems were noted with indication lights burning out. Inattention to details led to the staff being unaware of an impending due date for the review of radiation monitor setpoint calculations.

R1.2 Transportation of Radioactive Material

a. Inspection Scope (86750, 2515/133)

The inspectors reviewed the licensee's radioactive material transportation program in accordance with Temporary Instruction 2515/133, "Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71." This review included an assessment of training and qualifications of personnel, transportation of low specific activity (LSA) materials and surface contaminated objects (SCO), use of the international system of units, expansion of the radionuclide list, changes in radioactive limits, and classification of fissile material.

b. Observations and Findings

The shipping coordinator had received thorough training on the new regulations, and had a comprehensive knowledge of all changes and updates. The shipping coordinator had the responsibility of reviewing all work completed by the health physics technicians and radwaste workers, and for preparing shipping papers and labels. Licensee procedures did not specify that radwaste workers and health physics technicians were required to be trained in this area. Although comprehensive training had not been provided to these individuals, they attended task-specific training and an overview seminar for the new regulations. Comprehensive training on the new regulations for the radwaste staff was scheduled for the third quarter of 1997.

The inspectors reviewed the changes to the licensee's procedure for shipping radioactive material, DB-HP-1500, Revision 00, focusing on the processing and packaging of LSA material and SCO. Leaching requirements for LSA-III material, degree of uniformity of LSA material, and packaging requirements for all shipment types were addressed in the procedure and were consistent with the changes in the regulations. The inspectors reviewed shipping papers of both LSA material and SCO and determined that they also complied with the applicable regulations. However, the shipping paper format attached to the licensee's procedure was different from the actual shipping paper format used, though both shipping paper formats included the same information. The inspectors noted that the computer code used for transportation purposes had been updated with the new regulations.

The licensee had not implemented the use of the International System of Units (SI) in their procedure for the preparation of shipping documents and emergency response information which accompanies radioactive material shipments.

Mandatory use of SI for radiation units will become effective April 1, 1997, and these values will be required on shipping papers and on labels.

The licensee's transportation computer program had the table of A_1 and A_2 values for radionuclides installed to ensure that the packages do not exceed their allowable radioactivities. The inspectors reviewed selected A_1 and A_2 values generated from their computer code, including Co-60, Cs-137, Am-241, Zn-65, and Pu-241 and verified that the new values had been implemented. The inspectors also reviewed the licensee's procedures to determine if the waste streams had been adequately characterized. The licensee's current procedure for waste classification was vague as it stated, without other guidance, that software was utilized to classify radioactive material shipments and that all radioactive material shipped off site must be waste classified. A revision to the transportation procedure to include guidance on the waste classification process prior to shipment was being developed. This item will tracked as an inspection followup item pending the inspectors' review of the waste classification procedure revision. (IFI 50-346/96013-01).

c. Conclusion

Overall, the licensee adequately implemented the new transportation regulations. While no problems were noted with actual shipments and the associated paperwork, the governing procedure was in need of improvement particularly in the area of waste classification.

R1.3 Radioactive Waste

a. Inspection Scope (86750)

The inspectors reviewed the licensee's radwaste program, including waste generation and storage. The inspectors performed an inspection of the liquid waste processing system with the system engineer, and performed inspection of radwaste and radioactive material (RAM) storage areas. In addition, the inspectors interviewed radwaste personnel and reviewed documents related to the processing of resin used in the liquid radioactive waste processing system.

b. Observations and Findings

The inspectors noted some inconsistencies with the labeling of radioactive and contaminated material within the Low Level Radioactive Waste Storage Facility (LLRWSF). Although several different labeling methods were authorized by procedure and regulatory requirements were met, the licensee subsequently labeled the material in the LLRWSF consistently which made the designations easier to understand. The RAM located in the outdoor storage facilities was consistently labeled. The inspectors performed confirmatory surveys which determined that postings and labeling in the LLRWSF and the designated RAM storage areas were appropriate.

The licensee used a RAM management list for inventory purposes. This list is not required by procedure or regulation. This list grouped RAM by tag number and by owner. The inspectors compared the tags from seven RAM items to the material management list dated January 10, 1997. Two items were found not to agree with their description. In one case, a box of RAM had been deleted from the list, and in the other case, a box marked as empty was shown to contain RAM on the list. Although no regulatory violation was associated with these discrepancies, this also represented a lack of attention to detail in work activities.

The inspectors reviewed the licensee's resin dewatering processes. The licensee primarily used two high integrity containers (HICs) supplied by separate vendors for shipping dewatered resin. No dewatering activities were ongoing for observation while the inspectors were onsite. However, the inspectors identified procedural inconsistencies during their review. The licensee used vendor procedures for the dewatering process. Although separate dewatering instructions existed for each HIC, it appeared that several steps in one procedure needed to be followed for the other HIC type. The radwaste supervisor stated that some steps were unclear in the vendor procedures, including the dewatering verification step to ensure that the HIC contained less that one percent free-standing liquid by waste volume. A site-specific dewatering procedure to include clear instructions was under development. This issue will be tracked via an unresolved item pending the revision of the procedures. (URI 50-346/96013-02). The licensee had not been notified of any problems due to an excess amount of liquid in the HIC and all quality assurance (QA) checks had been reported to be satisfactory by the disposal site.

c. Conclusion

Overall the inspectors noted that the radwaste and RAM storage areas were well maintained. However, inconsistencies were noted between the RAM tracking list and actual RAM items present as well as with procedures for the resin dewatering process.

R2 Status of RP&C Facilities and Equipment

R2.1 Radiologically Restricted Area Inspections

a. Inspection Scope (83750)

The inspector performed inspections of the radiologically restricted area (RRA) and the turbine building, and reviewed numerous radiological surveys.

b. Observations and Findings

While inspecting radiologically restricted areas, the inspectors identified a number of general housekeeping problems, especially within contaminated areas. Once these were brought to the attention of licensee management, improvements were made to these areas.

The inspectors independently verified radiation postings, including "hot spots," to ensure that the postings were consistent with actual radiation levels. The inspectors identified one radiation area posting violation. The licensee controlled the truck bay adjacent to the cask wash down pit as a radiation area. The inspectors performed confirmatory radiation surveys and determined that this area had dose rates of approximately 10 millirem in one hour. The inspectors identified that one entry into the truck bay was not posted as a radiation area. This was in violation of 10 CFR 20.1902(a) which states that the licensee shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA." Of significance is that once the inspector informed licensee management of this problem, the area was not properly posted until it was brought to their attention again approximately ten days later. (VIO 50-346/96013-03).

The licensee had recently changed the format of various door signs throughout the plant. During this change the licensee identified that some areas were incorrectly reposted with signs bearing the words "Controlled Material Area" instead of "Caution, Radioactive Material Area." One "Caution, Radioactive Material Area" posting was removed for some time, with no additional controls, while the door was scheduled to be repainted. These posting problems were in violation of 10 CFR 20.1902(e) which states that the licensee shall post each area or room in which there is used or stored an amount of licensed material exceeding 10 times the quantity of such material specified in appendix C to part 20 with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL(S)" or "DANGER, RADIOACTIVE MATERIAL(S)." Once this was identified, it was reported through the licensee's PCAQR system, and the appropriate door postings were placed at the entries. To address this problem, the licensee created a posting verification checklist which requires a weekly RP review of all door signs. No further problems were identified by the inspectors in this area. This licensee-identified and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. (NCV 50-346/96013-04).

c. Conclusion

Inattention to detail led to some NRC and licensee-identified radiological posting problems. One violation was identified in this area.

R2.2 Spent Fuel Storage Facility

The inspectors reviewed select weekly surveys of the horizontal storage module (HSM) area in the spent fuel storage facility. The licensee performed these surveys as required by procedure. The dose rates were below the Certificate of Compliance limits for the HSM, and were recorded by the licensee as less than 2 millirem per hour neutron and 5 millirem per hour gamma on contact. The inspectors performed confirmatory surveys at the perimeter of the storage facility; no problems were noted.

R4 Staff Knowledge and Performance in RP&C

R4.1 Post Accident Sampling System (PASS)

a. Inspection Scope (84750)

The inspectors reviewed the licensee's PASS program. This included observing an attempt to obtain a PASS sample in December 1996, as well as the successful acquisition of a sample in January 1997. The inspectors also reviewed the past six month history of the PASS system.

b. Observations and Findings

As a training tool for chemistry testers a monthly PASS surveillance is routinely conducted. The monthly surveillance is not required by regulation but is proceduralized. However, the licensee performed the appropriate provisions designated by procedure to not perform the monthly test. Due to the failure of relief valve DW 4664, this surveillance was not conducted from July to December 1996. An emergency PASS sample could have been manually obtained during this timeframe. After the valve was repaired, the licensee attempted to perform the December 1996 PASS surveillance.

At the beginning of the actual system configuration, the testers were unable to open valve SV 4663, PASS High Pressure Sample Inlet. While one tester attempted to actuate the valve, the other tester went to the physical location of the valve to listen for any movement; no motion was heard. The testers again tried to open the valve, and the actuator button fell off. The surveillance was subsequently stopped. This problem was fixed in two days. After this, a sample was successfully obtained.

The inspectors observed another PASS sample acquisition in January 1997. During the valve line-up, another actuator button fell off the control panel, and several deficiency tags repeatedly fell from their positions, causing a delay in the sample collection. Despite these problems, the sample was successfully obtained and the PASS sample data was in agreement with the daily reactor coolant sample data.

c. Conclusion

The material condition of the PASS declined over the last several months. This resulted in the licensee not performing a monthly sample from July 1996 to December 1996. While the material condition problems did not prevent the licensee from having the ability to obtain emergency PASS samples, several portions of the system remained in need of repair at the end of this inspection period.

R4.2 Containment Entry (83750)

The inspectors accompanied the licensee on a containment entry on January 9, 1997. The inspectors attended an ALARA briefing for this job, and reviewed the appropriate Radiation Work Permit (RWP) for the work to be completed. The purpose of the containment entry was to obtain dose rates and temperature readings, and perform initial troubleshooting of level transmitter LTSP9A4. The ALARA briefing included discussions of expected area dose rates, job completion time, dosimetry, and protective clothing requirements. In addition, a surrogate tour was conducted by means of an interactive video system. Licensee personnel entering the containment were very familiar with the location of the job and work expectations. The job was completed within the anticipated time. HP coverage was dedicated to the containment entry, and the I&C representative remained in a lower dose rate area while performing the work activities. The licensee's preparation for the containment entry was very good and emphasized the minimization of personnel dose. The incorporation of the video system into the ALARA brief was very effective.

R7 Quality Assurance in RP&C Activities

R7.1 Dosimetry Program Performance

a. Inspection Scope (83750)

The inspectors reviewed the licensee's self-assessment of the dosimetry program. The inspectors also independently reviewed select dose records, and interviewed the HP staff regarding recent problems encountered with the personnel dosimetry vendor.

b. Observations and Findings

The self-assessment performed September 25-27, 1996, primarily focused on the licensee's dosimetry program. This assessment reviewed a quality assurance audit of the licensee's personnel dosimetry vendor in January 1996. The vendor audit found several technical weaknesses in the vendor program including untimely training, no pre-determined schedule to replace older thermoluminescent dosimeters (TLDs), and failure to inform the licensee when a new algorithm was instituted. The vendor replied to the licensee with an action plan, and the licensee closed the audit findings.

The licensee continued to use the same vendor to process quarterly TLD data. When the data was received for the third quarter of 1996, numerous TLD results were approximately 50 mrem higher than anticipated. The vendor reanalyzed the data using new correction factors but the doses were minimally changed. The licensee then compared the data received from the vendor with the entries made with electronic dosimeters (EDs). This revealed that approximately 20 people who had not entered the RRA in the third quarter had been assigned doses of 50-60

mrem. The vendor continued to review the abnormality and determined that a batch of TLDs had not been annealed after they were irradiated to calculate new element correction factors. The TLDs of the personnel who had not entered the RRA were used as background control samples, and a value of 54 mrem was subtracted from the TLDs which had not been annealed.

The inspectors reviewed other dosimetry discrepancies including "out of tolerance" results from two spiked neutron TLDs and from a beta-gamma spiked TLD processed by the vendor. The licensee is continuing to follow up on the vendor discrepancies.

c. Conclusion

The licensee's review of the vendor's dosimetry program was aggressive while following up on problems with TLD results.

X1 Exit Meeting Summary

On January 10, 1997, the inspectors presented the preliminary inspection results to members of licensee management. A followup phone conversation was made on February 6, 1997, during which the final inspection results were presented to the Radiation Protection Manager.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

*J. K. Wood, Vice President, Nuclear
*J. H. Lash, Plant Manager
*R. J. Scott, Manager, Radiation Protection
*J. L. Freels, Manager, Regulatory Affairs
*R. C. Zyduck, Manager, Design Basis Engineering
*G. W. Gillespie, Superintendent, Chemistry
*R. Coad, Superintendent, Radiation Protection
*R. A. Greenwood, Supervisor, Health Physics
*B. W. Sutton, Supervisor, Radiation Protection
L. A. Bonker, Supervisor, ALARA Services
L. H. Bowyer, Supervisor, Radwaste Operation
R. D. Messersmith, Supervisor, Chemistry
*K. C. Prasad, Senior Staff Engineer
*D. L. Miller, Senior Engineer, Licensing
*G. M. Wolf, Engineer, Licensing

* Attended Exit Meeting conducted 1/10/97

INSPECTION PROCEDURES USED

IP 83750:	Occupational Radiation Exposure
IP 84750:	Radioactive Waste Treatment and Effluent and Environmental Monitoring
IP 86750:	Solid Radioactive Waste Management and Transportation of Radioactive Materials
TI 2515/133:	Implementation of Revised 49 CFR Parts 100-179 and 10 CFR Part 71

ITEMS OPENED AND CLOSED

Opened

50-346/96013-01	IFI	Classification of radioactive waste.
50-346/96013-02	URI	Revision of dewatering procedures.
50-346/96013-03	VIO	Failure to post a radiation area.

Closed

50-346/96013-04 NCV Failure to post a radioactive material area.

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DOT	Department of Transportation
ED	Electronic Dosimeter
HIC	High Integrity Container
HP	Health Physics
I&C	Instrument and Controls
IFI	Inspection Followup Item
IP	Inspection Procedure
LLRWSF	Low Level Radioactive Waste Storage Facility
LSA	Low Specific Activity
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
PASS	Post Accident Sampling System
PCAQR	Potential Condition Adverse to Quality Report
QA	Quality Assurance
RAM	Radioactive Material
RP	Radiation Protection
RP&C	Radiological Protection and Chemistry
RRA	Radiological Restricted Area
RWP	Radiation Work Permit
SCO	Surface Contaminated Object
SI	International System of Units
TI	Temporary Instruction
TLD	Thermoluminescent Dosimeter

DOCUMENTS REVIEWED

Correspondence from Vectra Technologies, Inc. (Ken Hilton) to Davis Besse Nuclear Power Station (Bruce Geddis), June 5, 1996, "Changes to Dewatering Procedure."

Davis Besse Nuclear Power Station Approved Vendor Manual Procedures:

OM-062-WS, Revision 2, "Operating Procedure for the Dewatering of Bead and Powdered Ion Exchange Media (Vectra Technologies, Inc.);"

STD-P-03-010, Revision 10, "Transfer and Dewatering Bead Resin in Radlok High Integrity Containers."

Davis Besse Nuclear Power Station Intra-company Memorandums:

September 13, 1994 memo to L. H. Bowyer, Supervisor-Radwaste Operation, "RAM Storage;"

November 18, 1996 memo to R.A. Greenwood, CHP, Supervisor-Health Physics, "Third Quarter Thermoluminescent Dosimeter dose report from Teledyne Brown;"

December 5, 1996 memo to L. A. Bonker, Supervisor-ALARA Services, "Annual Review of Radiation Monitoring Setpoints."

Davis Besse Nuclear Power Station Offsite Dose Calculation Manual, Revision 9.

Davis Besse Nuclear Power Station Periodic Test Procedure:

DB-CH-04001 Revision 5, C-4, "Post Accident Sampling System Monthly Test."

Davis Besse Nuclear Power Station Radiation Protection Procedures:

DB-HP-01100, Revision 2, "Radiation, Contamination, and Airborne Radioactivity Areas;"

DB-HP-01702, Revision 4, "Transfer, Handling and Storage of Radioactive Material within Davis Besse Nuclear Power Station;"

DB-HP-1500, Revision 00, "Shipping Radioactive Material;"

DB-HP-03002, Revision 1, "Dewatering Verification;"

DB-HP-10000, Revision 4, "Radiation Monitor Setpoint Control."

Davis Besse Nuclear Power Station Radioactive Liquid Batch Release Permits: Release Number 2311.

Davis Besse Nuclear Power Station Radiation Work Permit Packages:

1996-1018: Resin Sluice from Spent Resin Storage Tank to Shipping Cask located in Aux. Building Train Bay;

1996-1024: Resin Sluice from Spent Resin Storage Tank to Shipping Cask located in Aux. Building Train Bay;

1996-1026: Transfer Filter HIC to Truck for Shipment;

1996-1028: Transfer of Spent Duratek resin HIC to Shipping Cask;

1997-2000, Rev. 0: Containment entry.

Davis Besse Nuclear Power Station Surveillance Test Procedures:

DB-OP-03011, Revision 02, "Radioactive Liquid Batch Release."

Material Management by Tag Number List, January 10, 1997.

Post Accident Sampling System Analysis, January 8, 1997.

Potential Condition Adverse to Quality Reports:

96-1316; 96-1399; 96-1402; 96-1529.

Radioactive Material Shipment Records:

Shipment Number 96-9657;

Shipment ID Number 0796-6119.

Radiation Monitor Setpoint Manual.

Radiation Protection Management Task List.

Radiological Surveys: 96-01788; 96-01836; 96-01884; 96-1928.