

U. S. NUCLEAR REGULATORY COMMISSION  
REGION III

Report Nos. 50-315/90020(DRSS); 50-316/90020(DRSS)

Docket Nos. 50-315; 50-316

License Nos. DPR-58; DPR-74

Licensee: Indiana Michigan Power Company  
1 Riverside Plaza  
Columbus, OH 43216

Facility Name: D. C. Cook Nuclear Plant, Units 1 and 2

Inspection At: D. C. Cook Site, Bridgman, Michigan

Inspection Conducted: August 27 - 31 and September 14, 1990

Inspectors: *R. A. Paul*  
R. A. Paul

10/3/90  
Date

*W. B. Grant*  
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10/3/90  
Date

*A. G. Januska*  
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10/3/90  
Date

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

10/4/90  
Date

Inspection Summary

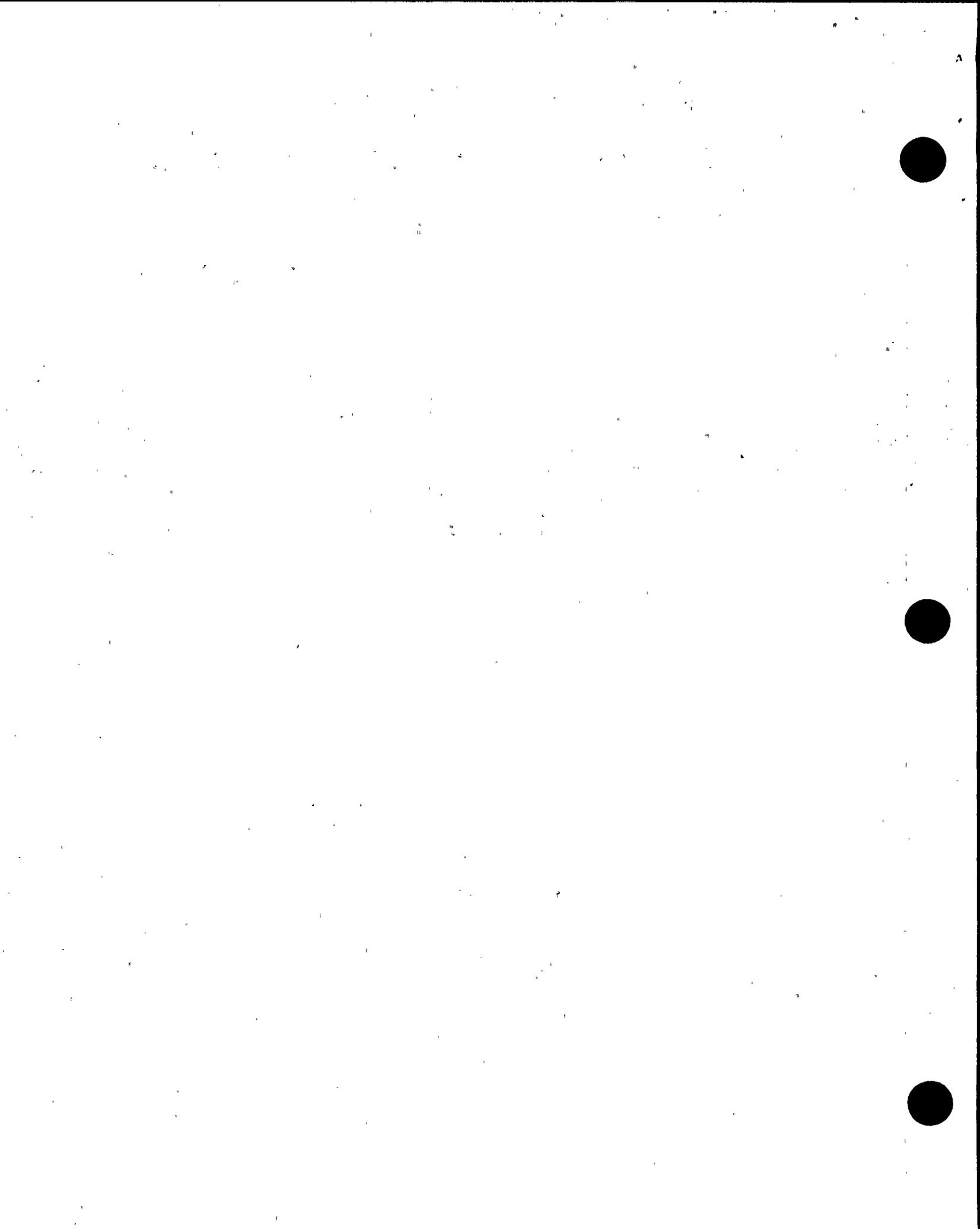
Inspection on August 27 - 31 and September 14, 1990 (Report Nos. 50-315/90020(DRSS); 50-316/90020(DRSS))

Areas Inspected: Routine unannounced inspection of the licensee's radwaste/transportation program, including: organization and management controls (IP 83750, 84750), training and qualifications (IP 83750, 84750) gaseous radwaste (IP 84750), liquid radwaste (IP 84750), shipping and transportation (IP 83750), audits and appraisals (IP 83750, 84750), air cleaning systems (IP 84750) and review of actions on previously identified open items (IP 92701). Also reviewed were events involving personal contaminations and entry into a high radiation area.

Results: The organizational structure, management controls, staffing levels, and upper management support for the radwaste/transportation program appeared generally adequate. One strength is the licensee's 10 CFR 61 waste generation, classification, and characterization program. A weakness was identified



involving poor management oversight of contractor activities which resulted in a violation (failure to perform an evaluation - Section 13). Also a non-cited violation was identified (failure to control an T/S high radiation door - Section 14).



## DETAILS

### 1. Persons Contacted

- 1 T. Andert, TPS/Chemical
- 1,2 A. Blind, Plant Manager
- 1,2 S. Colvis, AEPSC/RadSupport
  - K. Cunningham, RadWaste Supervisor
- 2 C. Flis, Senior Performance Engineer
- 2 D. Foster, Radiation Materials Specialist
- P. Holland, TSP/RP Supervisor
- 1 R. Huerter, QA Supervisor
- 1 J. Kambach, TPS/RP
- T. Lechenet, Sr. RP Technician
- 1 S. Lehrer, TPS/RP Supervisor
- M. Lester, Performance Engineer
- 1 J. Long, TPS/ RadWaste Handling Supervisor
- 1 R. Looker, TPS/ Chemical Supervisor
- 1,2 D. Loope, TPS/RPM
- 1 D. Noble, TPS/RP
- 1 J. Nodeau, AEPSC Site QA
- 1 J. Rutkowski, RPM-Technical
- 1 L. Umphrey, TPS/ACC Supervisor
- 1,2 D. Williams, TPS/ RP Supervisor
- 1,2 J. Wojcik, TPS Superintendent
- 1,2 J. Isom, NRC Senior Resident Inspector

1 Present at the Exit Meeting on August 31, 1990

2 Present during telephone conversation on September 14, 1990

### 2. General

This inspection was conducted to review the licensee's radwaste/ radioactive material shipping and transportation program and liquid, gaseous, and solid radwaste management programs including compliance with waste generator requirements of 10 CFR 20 and 10 CFR 61. The inspection included tours of the onsite radwaste facilities, observation of work in progress, review of representative records, and discussions with licensee and contractor personnel.

### 3. Licensee Action on Previous Inspection Findings (IP 93701)

- a. (Closed) Unresolved Item (315/89016-05; 316/89017-05);  
Evaluate the current testing program for the removal efficiency of methyl iodide carbon adsorbers in the technical specification (T/S) required air cleaning systems. The licensee has completed his evaluation and is performing dual laboratory tests on the carbon adsorbers: one which is required by T/S and the other which meets the current NRC guidance. If the adsorber fails either test the filters are changed. (See Section 11)

b. (Closed) Open Item (315/89016-04; 316/89017-04):

Licensee needs to expedite the resolution of recurrent problems with the Westinghouse liquid radwaste effluent monitors. A change in the calibration procedure for the Westinghouse monitors now requires that the efficiency and linearity portions of the calibration be performed by Radiation Protection and the electronic portion by Instruments and Controls. Both inputs are required and must be successfully completed before the monitors are put back in service and approved for use. Implementation of this change resulted in more reliable operation of the monitors and allowed the licensee to return to the previously used 18 month calibration schedule.

c. (Closed) Open Item (315/89016-02; 316/89017-02):

Licensee should develop a formal batch release program for containment vents and reduce (if appropriate) the frequency of containment vents. The licensee initiated a program to determine the inventory of the noble gasses in containment batch releases. Samples were collected three times each week during the study and the ratios of Xe-133, Xe-135 and Ar-41 were established. Samples continue to be taken every other week and the ratios updated every quarter. Vents are quantified using the Plant Vent Noble Gas Monitor results and current ratios.

In an effort to reduce containment vents the licensee repaired valve leakage in the controlled air system during the Unit 1 outage in early 1989. Vents during the last half of 1989 were lower, however they increased again during the first half of 1990.

d. (Closed) Unresolved Item (315/87002-23; 316/87002-23):

Resolve CREVS operability concerns. In a letter, dated June 29, 1989, the licensee submitted an application to the NRC for amendment to Technical Specification (T/S) 3/4.7.5.1 governing the Control Room Emergency Ventilation System (CREVS) and its associated Bases section. The proposed changes address CREVS operability concerns related to NUREG-0737 Item III.D.3.4. A following letter, dated July 15, 1990, was submitted to the NRC pursuant to a discussion the licensee held with the NRC staff on May 21, 1990, regarding the proposed changes to T/S 3/4.7.5.1 and their supporting analyses. Specifically, the licensee stated that it intends to recalculate the control room thyroid doses based on the discussion held with the NRC staff regarding manual damper closure time and charcoal adsorber efficiency. Further, the licensee stated its understanding that the NRC expects to issue a generic letter on control room habitability in the near future. The licensee also stated that, as discussed with the NRC staff, the revised calculations (and any necessary revisions to the proposed T/S) will be submitted within 60 days of receipt of the generic letter. Since the licensee has adequately responded to all identified NRC concerns, this matter is closed.



- e. (Closed) Open Item (316/89034-01): Review licensee's actions to preclude recurrence of allowing work in containment to continue with the purge system not operating. In addition to the corrective actions described in Inspection Report Nos. 50-315/90014 and 50-316/90014, the licensee initiated Standing Order 050.097 "Operation of Containment Purge" and TPS0.025 "Radiological Coordination of Purge Outages". The inspectors reviewed these documents and verified they have been implemented. This item is considered closed.
- f. (Closed) Open Item (315/90014-01); 316/90014-01): Review licensee's investigation of an event involving hot particles that ensued from pressure testing of a let-down safety valve. The results of the inspectors review is documented in Inspection Report Nos. 50-315/90020 and 50-316/90020. A violation was issued concerning this event (50-315/90020-02; 50-316/90020-02) and the licensee's corrective actions will be reviewed during a future inspection.

4. Organization and Management Controls (IP 83750, 84750)

The inspectors reviewed the licensee's organization and management controls for the radwaste, shipping, and transportation programs including organizational structure, staffing, delineation of authority, effectiveness of procedures and other management techniques used to implement the program, and experience concerning self-identification and correction of program implementation weaknesses.

The overall management of the solid, liquid and gaseous radwaste and radwaste transportation programs is described in Inspection Report Nos. 50-315/89016 and 50-316/89017. The organization and management controls for the radwaste/transportation programs appear adequate.

No violations or deviations were identified.

5. Training and Qualifications (IP 83750, 84750)

The inspector reviewed the training and qualification aspects of the licensee's radwaste/transportation program, including: changes in responsibilities, policies, programs, and methods; qualifications of the newly-hired or promoted personnel; and provisions for appropriate radwaste/transportation training of personnel.

The inspectors reviewed the training and qualification requirements and selected training documentation for radwaste personnel; no problems were noted. Training in radwaste handling, storage, shipping and transportation is conducted annually. Radwaste training was conducted on June 6-7, 1990 by a contractor, Scientific Ecology Group Inc. (SEG), and included: burial site requirements; waste classification; waste form; waste processing; DOT/NRC regulations; transportation; radiation limits; and labeling and placarding. The inspector reviewed the training lesson plans; no problems were noted.

No violations or deviations were identified.



6. Liquid Radioactive Wastes (IP 84750)

The inspectors reviewed the licensee's liquid radioactive waste (radwaste) effluent program including: procedures for calibration, monitor alarm setpoints and discharge batch releases; and records of functional tests, calibrations and batch releases. Liquid effluents are released on a batch basis, sampled, analyzed and approved prior to release. Liquid wastes are generated from various sources and are collected in "clean" waste and station drain holdup tanks where they are processed through filters and the waste evaporator. The processed wastes are collected in the waste condensate tank, sampled, and released through the Unit 1 or 2 discharge tunnels. This release pathway and the blowdown demineralizer pathway are equipped with radiation monitors.

Operability of the radwaste monitor (R-18) is verified by the licensee by reading and logging the background daily. The Semiannual Radioactive Effluent Release Report for 1989 was reviewed and indicated that total body and the maximum organ doses were lower than in 1988. The procedures used in calibrating the monitors and for batch releases appear to be technically sound. Selected monitor calibrations and batch release packages which included setpoint determinations, review and approval, and Operations involvement were examined. The calibrations were completed in accordance with the required frequency and procedure requirements. The batch release packages appeared to have been properly completed.

No violations or deviations were identified.

7. Gaseous Radioactive Wastes (IP 84750)

The inspectors reviewed selected portions of its gaseous radwaste program including calibration and batch release procedures and their implementation, and the Semiannual Radioactive Effluent Release Report for 1989. The licensee reported fewer batch releases in 1989 (266) than in 1988 (326) including an order of magnitude reduction in I-131 and a factor of 2.5 reduction in fission and activation gases. Tritium and air particulates increased by factors of three and 28 respectively.

The gaseous radioactive waste system is part of the plant ventilation system. The turbine building exhaust is not a normal discharge path for gaseous waste and is not monitored. The auxiliary building, containment ventilation and waste gas systems discharge into the unit vents (2) which are monitored for noble gases, air particulates and iodines. These systems exhaust the fuel handling, safeguards and other areas, containment, gas decay tanks and other tank vents. These systems are HEPA filtered. In addition, the fuel handling area and the safeguards areas have the capability of passing the filtered stream through charcoal adsorbers.

Gases are released in either the continuous or batch mode. Continuous releases are quantified by analyzing weekly stack grab samples for noble gases, air particulates and charcoal samples. Containment purges and waste gas decay tank releases are quantified by grab samples analyses; containment vents are quantified using predetermined isotope mix data and current monitor data.

Calibration and batch release packages were completed in accordance with appropriate procedures and appear to be adequately implemented.

No violations or deviations were identified.

8. Solid Radwaste (IP 84750)

The inspectors reviewed the licensee's solid radwaste management program, including: changes in equipment and procedures; processing, control, and storage of solid radwaste; adequacy of required records, reports, and notifications; and implementation of procedures to properly classify and characterize waste, preparation of manifests, and marking of packages.

The inspectors reviewed selected portions of the licensee's solid radwaste processing, storage, and shipping records for 1989 and 1990. Licensee records indicate approximately 13670 and 2300 cubic feet of solid radwaste were shipped for burial in 1989 and 1990 to date, respectively which continues the downward trend of the past five years. This success is due, in part, to having a licensed contractor remove essentially unsorted dry active waste (DAW) to the contractor's facility where it is sorted, compacted, and shipped to the burial site using the licensee's allotments. The licensee does, however, sort trash to identify and remove contaminated material and removes reusable or water containing items from contaminated trash. The licensee dewateres resins and prepares spent filters for shipment. The inspector toured the solid radwaste facilities, including the sorting areas, the storage facilities, and the shipping areas; no problems were noted.

No violations or deviations were identified.

9. Transportation (IP 83750)

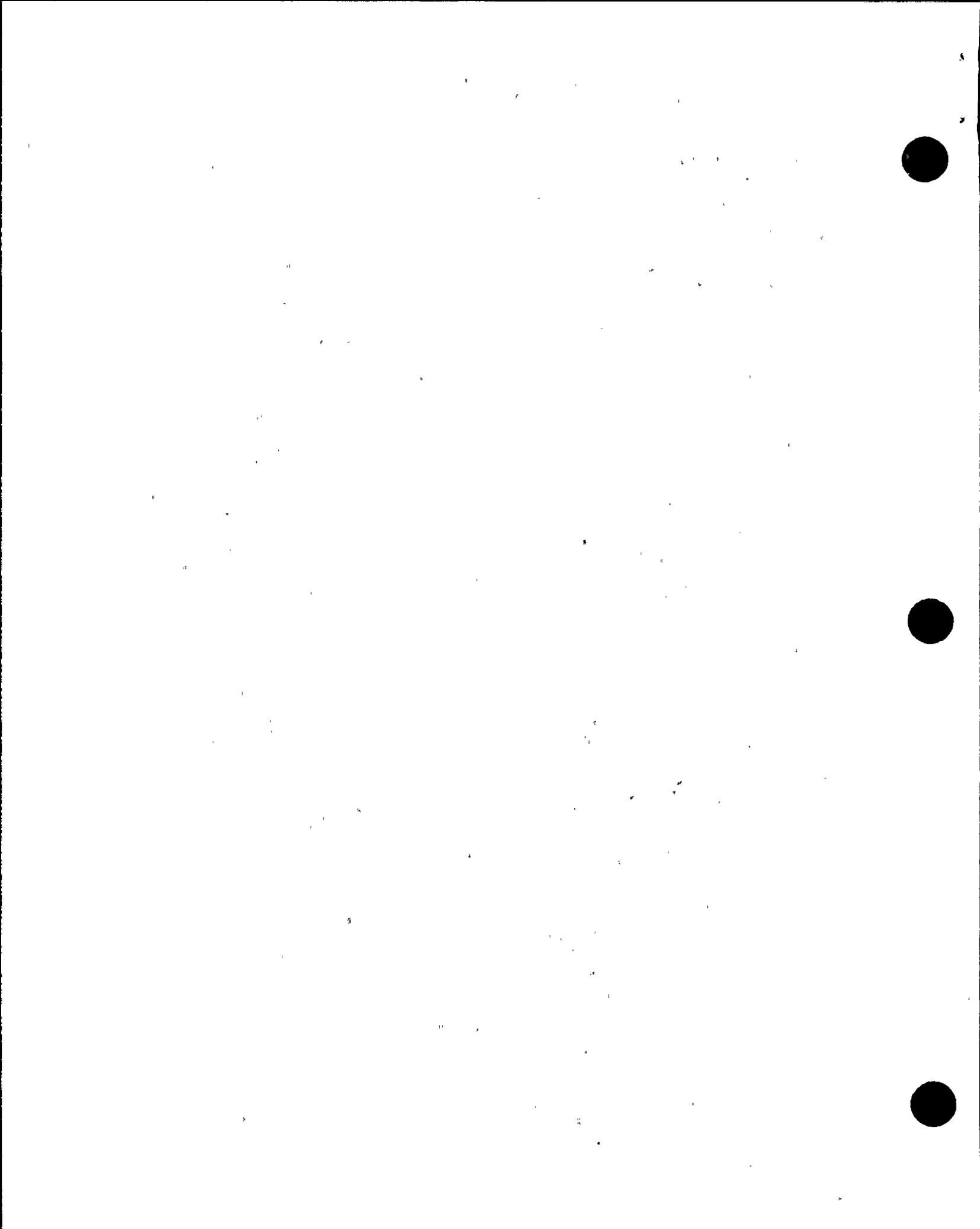
The inspectors reviewed the licensee's transportation of radioactive material program, including: determination whether written implementing procedures are adequate, maintained current, properly approved, and acceptably implemented; determination whether shipments are in compliance with NRC and DOT regulations and the licensee's quality assurance program; determination if there were any transportation incidents involving licensee shipments; adequacy of required records, reports, shipment documentation.

The inspectors selectively reviewed radwaste shipping records for 1989 and 1990 to date. Information on the shipping records appears to satisfy NRC, DOT, and burial site requirements. The licensee made 130 shipments in 1989 and 47 shipments in 1990 to date to the burial site by way of their contractor. The shipments consisted of approximately 13670 and 2300 cubic feet for 1989 and 1990, respectively. No problems were identified.

No violations or deviations were identified.

10. Audits and Appraisals (IP 83750, 84750)

The inspectors reviewed reports of audits and appraisals conducted by the licensee including audits required by the technical specifications.



Also reviewed were management techniques used to implement and audit the program.

The inspector reviewed the QA audit and surveillance reports for 1989 and 1990 to date. The licensee's QA audit/surveillance program appears adequate to assess the technical performance, compliance with technical specification requirements, and personnel training/qualifications relating to the radwaste/transportation program. The QA auditors assigned to review this functional area appear to have the necessary expertise and experience prerequisites. Interviews with appropriate licensee personnel indicate that responses to audit/surveillance findings are generally thorough, timely, and technically sound.

No violations or deviations were identified.

11. Air Cleaning Systems (IP 84750)

Technical Specifications (T/S) require filter testing of the Control Room Ventilation Systems (one filter train for each unit) as specified by T/S 3/4.7.23; the Engineered Safety Features (ESF) Ventilation Systems (two independent filter trains for each unit) as specified by T/S 3/4.7.19; and the Spent Fuel Storage Pool Exhaust Ventilation System as specified by T/S 3.9.13. The in-place leakage test criterion specified for both the DOP testing of HEPA filters and for the freon testing of carbon adsorbers is equal to or less than one percent penetration. The laboratory test criterion for carbon sample removal efficiency for methyl iodide is equal to or greater than 90 percent. A selective review of surveillance test data for 1989 and 1990 showed that the surveillances on the ventilation systems met test acceptance criteria.

No violations or deviations were identified.

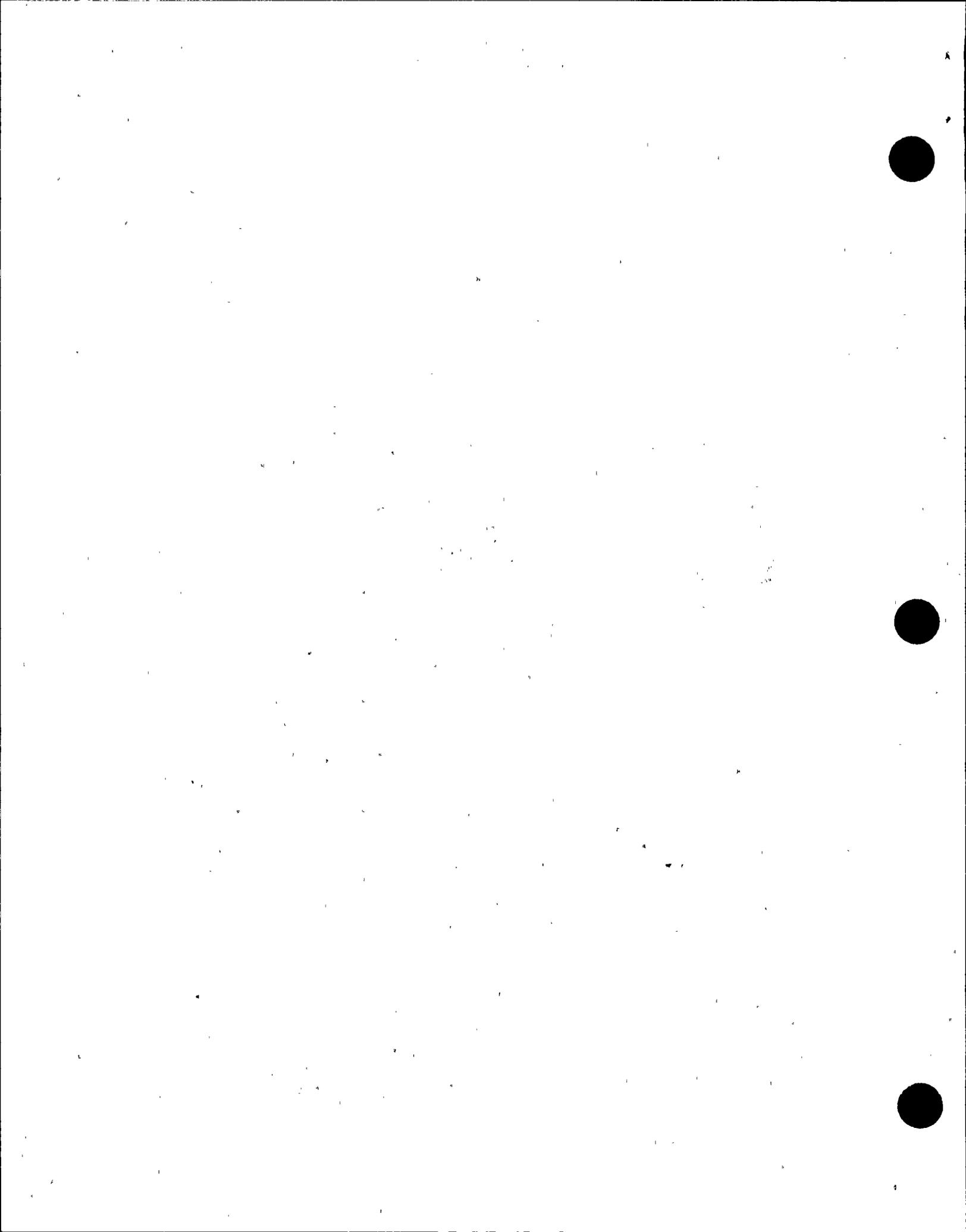
12. Primary Coolant Radiochemistry (IP 84750)

Technical Specification 3.4.8 requires that the specific activity of the primary coolant not exceed one microcurie per gram of dose equivalent I-131 (DEI-131) except under certain limiting conditions of operation. The inspectors selectively reviewed the licensee's primary coolant radiochemistry results for 1990 to determine compliance with the Technical Specification requirements for the (DEI-131) concentration. The selective review and discussion with licensee personnel indicated that the DEI-131 concentration for the primary system remained less than the applicable Technical Specification limit throughout the review period for both units.

No violations or deviations were identified.

13. Hot Particle Personal and Area Contamination Event (IP 93702)

The inspectors reviewed the circumstances surrounding an incident in which one worker received a radiation exposure from hot particles and a minor physical injury. Several workers had shoe contamination resulting from the incident. The inspector contacted cognizant station



health physicists, the exposed worker and a maintenance supervisor, reviewed pertinent radiation protection records, survey results, and the preliminary results of the licensee's investigation.

a. Event

On July 11, 1990, a maintenance contractor performed a pressure test on a highly contaminated Chemical Volume and Control System (CVCS) safety relief valve. The test was conducted using a new test rig which had never been used or evaluated on a contaminated valve, and was performed inside a temporarily constructed herculite tent. The tent was constructed for the test and located next to the Hot Machine Shop on the 650 foot level of the Auxiliary building. A HEPA ventilation system with an elephant trunk was installed inside the tent. A shaped aluminum funnel, fabricated by station personnel at the request of the RP technician covering this job, was attached to the elephant trunk and duct taped to the valve mounted on the test rig. When the valve being tested lifted at approximately 600 psig, the funnel was blown off the valve, ricocheted off the scaffolding inside the tent, tore the herculite, and struck the chest of the RP technician standing outside the tent. Although the funnel tore the herculite, it remained within the tent. The RP technician and the surrounding area were contaminated by contaminated water and hot particles that penetrated the torn herculite. The licensee calculated exposure to the technician's skin from hot particles to be less than regulatory limits; the inspector agreed with the licensee's dose evaluation.

b. Assessment

The root cause of the event appears to be inadequate pre-planning and evaluation of a contractor performed job that involved new test equipment. An ALARA review was not performed because the anticipated dose did not meet the procedural criteria for such a review and radiological and physical hazards associated with using the new equipment on a contaminated valve were not determined before hand. The new equipment consisted of an accumulator which allows a greater volume of pressurized air to be discharged during the test than that discharged from the equipment normally used thus keeping the valve open longer. It appears the configuration of the aluminum funnel taped to the test rig was arranged between the RP technician and the contract tester without adequate knowledge of the potential hazards. The failure to perform an adequate evaluation before the test was performed was an apparent violation of 10 CFR 20.201 (b) which requires performance of such surveys (evaluations) as are reasonable to evaluate the extent of the radiation hazards that may be present (Violation 50-315/90020-01; 50-316/90020-01). It also appears the test was performed using the accumulator under a vendor test procedure which was not formally approved by the licensee for the test. The Senior Resident Inspector will review this matter and discuss his findings in Inspection Report Nos. 50-315/90021 and 50-316/90021.

After the incident the licensee discontinued testing of the contaminated valves with the new test equipment until further evaluations are performed. The herculite tent was removed, and a specially built all-aluminum structure was installed for the performance of similar tests on non-contaminated valves.

One violation was identified.

14. Extreme High Radiation Area (EHRA) Door Control (IP 93702)

During a routine plant walkdown on August 21, 1990, the RPM found the EHRA gate to the high level storage room unlocked. Subsequent surveys inside the room indicated the highest dose rate was about 22 R/hour on contact of a storage barrel, and the general room area was about 1200 mR/hour. Immediate corrective actions to properly control the area were taken.

An investigation of this matter was performed and although they could not determine how failure to lock the gate occurred, no evidence of an unauthorized entry during the period the gate was open could be found. Technical Specification 6.12.2 requires locked doors to be provided to prevent unauthorized entry into areas with radiation levels greater than 1000 mR/hour. The unlocked EHRA gate is an example of a violation of Technical Specification 6.12.2, however, pursuant to Section V.A. of Appendix C to 10 CFR Part 2, a notice of Violation will not be issued for this isolated Severity Level IV violation because the licensee initiated appropriate corrective actions, including administrative and physical controls, before the inspection ended. This matter is closed. (NCV 50-315/90020-02; 50-316/90020-02)

15. Exit Interview

The scope and findings of the inspection were discussed with licensee representatives (Section 1) at the conclusion of the inspection on August 31, 1990. Further discussions were held on September 14, 1990 concerning the upgrade of liquid process monitors and containment vent quantification (Section 2), the Notice of Violation for failure to perform adequate surveys (Section 13), and the noncitable violation involving a T/S EHRA (Section 14). Licensee representatives did not identify any documents or processes reviewed during the inspection as proprietary.