

OCT 25 1982

APPENDIX C

U. S. NUCLEAR REGULATORY COMMISSION  
REGION IV

Reports: 50-313/8214  
50-368/8211

Licenses: DPR-51  
NPF-6

Dockets: 50-313  
50-368

Licensee: Arkansas Power and Light Company (AP&L)  
Post Office Box 551  
Little Rock, Arkansas 72203

Facility: Arkansas Nuclear One, Units 1 and 2  
Russellville, Arkansas

Inspection Conducted: June 21-25, 1982, and September 13-17, 1982

Inspectors: *Lorenzo Wilborn* 10/7/82  
Lorenzo Wilborn, Radiation Specialist Date

*H Chaney* 10/6/82  
Harold D. Chaney, Radiation Specialist Date

*for Lorenzo Wilborn* 10/7/82  
Wesley L. Holley, Radiation Specialist Date

*E. H. Johnson* 10/21/82  
E. H. Johnson, Director of Enforcement Date

Approved: *Blaine Murray* 10/7/82  
Blaine Murray, Chief, Facilities Radiation Date  
Protection Section

Inspection Summary

Inspection conducted June 21-25, 1982, and September 13-17, 1982  
(Reports 313/8214 and 368/8211)

Area Inspected: Routine, unannounced inspection of: (1) the licensee's radioactive waste systems, transportation activities, and periodic maintenance of packages including organization; training and qualifications; liquid and gaseous effluent releases; records and reports of radioactive effluents; procedures for controlling effluent releases; testing of air cleaning systems; instrumentation; reactor coolant water quality; radiochemistry quality control; solid radioactive waste program; and audits performed by the licensee; and (2) the licensee's response to NUREG-0737, "Clarification of TMI Action Plan Requirements," Items II.B.2, II.B.3, II.E.4.2, II.F - Attachments 1-3, III.D.3.3, and III.D.3.4. The inspection involved 116 onsite inspector-hours by three NRC inspectors.

Results: One violation is discussed in paragraph 15.c. One deviation is discussed in paragraph 16.a. No new unresolved items were identified. Twenty-two new open items are discussed in paragraphs 15 and 16.

DETAILS1. Persons ContactedArkansas Power and Light Company

\*B. A. Baker, Manager, Operations  
 \*E. C. Ewing, Manager, Engineering and Technical Support  
 \*L. J. Dugger, Manager, Special Projects  
 \*P. Jones, Instrument and Control Superintendent  
 \*G. Fiser, Radiochemistry Supervisor  
 \*S. R. Lueders, Radioactive Waste Coordinator  
 M. Frala, Assistant Radiochemistry Supervisor  
 J. McWilliams, Operations Superintendent, Unit 1  
 R. Wewers, Operations Superintendent, Unit 2  
 C. Halbert, Mechanical Engineering Supervisor  
 H. Carpenter, Instrument and Control Supervisor  
 J. Roberson, Instrument and Control Supervisor  
 L. Schempp, Quality Control Manager  
 D. Provencher, Quality Assurance Engineer  
 T. Pugh, Lead Trainer  
 J. Shea, Corporate Engineer  
 D. Boyd, Emergency Planning Coordinator

Others

R. Clements, Consultant, Institute of Resource Management  
 \*W. D. Johnson, NRC Resident Inspector  
 \*L. J. Callan, NRC Resident Inspector

\*Denotes those present during the exit interview.

2. Scope of Inspection

The purpose of this inspection was to review the licensee's radioactive waste systems, transportation activities, and responses to certain sections of NUREG-0737, "Clarification of TMI Action Plan Requirements," for the period November 7, 1980-June 24, 1982.

3. Licensee Action on Previous Inspection Findings

(Closed) Violation (313/7814): Transportation - This item was discussed in NRC Inspection Report 7814 and involved a shipment of BIRM filters with improper inlet and outlet connections and inadequate absorbent material for the liquid that was present. The licensee has eliminated use of the BIRM filter units and has included special instructions in curie estimation procedures that will ensure that items of unique geometries are brought to the attention of the HP Superintendent for evaluation. This item is considered closed.

(Closed) Violation (313/7817-01): Control of Radioactive Gaseous Release - This item was discussed in NRC Inspection Report 313/7817 and involved a radioactive gaseous release that exceeded Technical Specification limits. The licensee's corrective action included the development and implementation of Procedure 1604.14, "Reactor Building Purge Analysis," Revision 7, dated November 4, 1981, and Procedure 1607.14, "Reactor Building Purge Sampling Procedure," dated November 25, 1981. This item is considered closed.

(Closed) Violation (313/8102 and 368/8102): Transportation - This item was discussed in NRC Inspection Report 8102 and involved a shipment of radioactive material that contained materials and activities that were not described on the shipping papers for that shipment. The licensee has implemented stenciling of required information onto containers prior to filling of them. This item is considered closed.

(Open) Significant Weakness (313/8020 and 368/8020): Radioactive Waste - This item was discussed in NRC Inspection Report 8020 and involved specific procedures that had not been implemented for collection, compaction, and movement of radioactive waste materials. The licensee has initiated changes to its procedures to correct the problems identified in the appraisal report. Not all procedures had been issued at the time of this inspection. See Section 15.h of this report. This item is considered open pending completion of the scheduled corrective action.

(Closed) Significant Weakness (50313/8020 and 368/8020): Engineering Controls - This item was discussed in NRC Inspection Report 8020 and involved a lack of engineering controls and good decontamination and housekeeping practices in the Unit 1 auxiliary building. The licensee has completed plant modifications to correct the problems associated with airborne releases in the Unit 1 auxiliary building. This item is considered closed.

#### 4. Open Items Identified During This Inspection

Open Item (313/8214)/(368/8211)-(01): Management of Transportation Activities - The licensee has not provided adequate attention to the selection and training of a qualified replacement for the departing Radwaste Coordinator; provided adequate staffing and management oversight to station activities controlled by the Radwaste Coordinator. See paragraph 15.a for details.

Open Item (313/8214)/(368/8211)-(02): Training and Qualifications - The licensee needs to implement a suitable training and retraining program for personnel involved in transportation activities, and establish definitive qualifications for the position of Radwaste Coordinator. See paragraph 15.b for details.

Open Item (313/8214)/(368/8211)-(03): Packaging of Radioactive Materials - The licensee needs to provide detailed procedures and quality assurance controls over all aspects of radioactive material transportation activities. See paragraph 15.d for details.

Open Item (313/8214)/(368/8211)-(04): Closure of Shipment Liners - The licensee needs to evaluate the closure and sealing methods used on DOT 7A liners containing dewatered spent resins or filter elements. See paragraph 15.e for details.

Open Item (313/8214)/(368/8211)-(05): Procedures for Transportation Activities - The licensee had not provided detailed and accurate procedures for all operations involving the transfer, packaging, and transport of radioactive materials. See paragraph 15.f for details.

Open Item (313/8214)/(368/8211)-(06): Radioactive Waste Storage - The licensee needs to evaluate the radioactive material inventory within the radioactive waste storage building and implement actions to reduce the volume of stored volumes of radioactive liquids and materials of unknown origin and radioactivity. See paragraph 15.g for details.

Open Item (313/8214)/(368/8211)-(07): Transportation Quality Assurance - The licensee needs to increase the depth of onsite Quality Assurance audits of Transportation activities and include in the audit team a person with health physics or transportation expertise.

The licensee needs to complete corrective action for audit findings involving improperly stored liquid wastes. See paragraph 15.h for details.

Open Item (313/8214)/(368/8211)-(08): Control Room Dose Rate Calculations - The licensee had not calculated the dose rates in the control room for postaccident operation. See paragraph 16.a for details.

Open Item (313/8214)/(368/8211)-(09): Postaccident Sampling and Analyzing Capability - Postaccident Sampling and Analyzing Capability not fully operational. See paragraph 16.b for details.

Open Item (313/8214)/(368/8211)-(10): Documentation of Grab Sampling Analysis Contract - The licensee could not locate their contract with Oak Ridge National Laboratory to perform grab sample analysis. See paragraph 16.b for details.

Open Item (313/8214)/(368/8211)-(11): Noble Gas Effluent Monitor Scales Overlap - The licensee could not document the scale overlap for the medium and high scales of the noble gas effluent monitor. See paragraph 16.d for details.

Open Item (313/8214)/(368/8211)-(12): Sample Probe Isokinetic Capability - The licensee had not documented the sample probe isokinetic capability for air flow velocity variations. See paragraph 16.d(2)(c) for details.

Open Item (313/8214)/(368/8211)-(13): Entrained Moisture in Gas Sampling Lines - The licensee has experienced gas entrainment of moisture in gas sampling lines which degrades the collection of radio-iodines. See paragraph 16.d(2)(c) for details.

Open Item (313/8214)/(368/8211)-(14): Location of Unit 2 Containment High-Range Radiation Monitors - The licensee did not have documentation regarding the location of the Containment High-Range Radiation Monitors in Unit 2 containment. See paragraph 16.d(3)(c) for details.

Open Item (313/8214)/(368/8211)-(15): Operability of Containment High Range Radiation Monitors - The licensee could not verify that the Containment High-Range Radiation Monitors are operable in an accident environment. See paragraph 16.d(3)(c) for details.

Open Item (313/8214)/(368/8211)-(16): Containment High-Range Radiation Monitor Response - The licensee did not have documentation regarding the response of the Containment High-Range Radiation Monitors. See paragraph 16.d(3)(2) for details.

Open Item (313/8214)/(368/8211)-(17): Accident - Analysis - The licensee did not meet the required Accident Analysis for Control Room Habitability Requirements. See paragraph 16.f(3) for details.

Open Item (313/8214)/(368/8211)-(18): Filter - Cartridge Removal - The inspectors did not review filter and cartridge removal - installation in SPING. See paragraph 16.d(2)(c) for details.

Open Item (313/8214)/(368/8211)-(19): Containment High Radiation Monitors Laboratory Calibration - The inspectors did not review the laboratory calibration of this equipment. See Paragraph 16.d(3)(c) for details.

Open Item (313/8214)/(368/8211)-(20): Management Responsibility for NUREG-0737 Items - The inspectors did not review the proper management responsibility for these NUREG items. See paragraph 16.g for details.

Open Item (313/8214)/(368/8211)-(21): PASS Facility Exhaust System Filters - The ventilation exhaust filters of the PASS Facility were not inspected. See paragraph 16.b(3) for details.

Open Item (313/8214)/(368/8211)-(22): Radiation Qualification - The Radiation Qualification of Safety-Related Equipment was not reviewed. See paragraph 16.a(3) for details.

#### 5. Radioactive Waste Management Organization

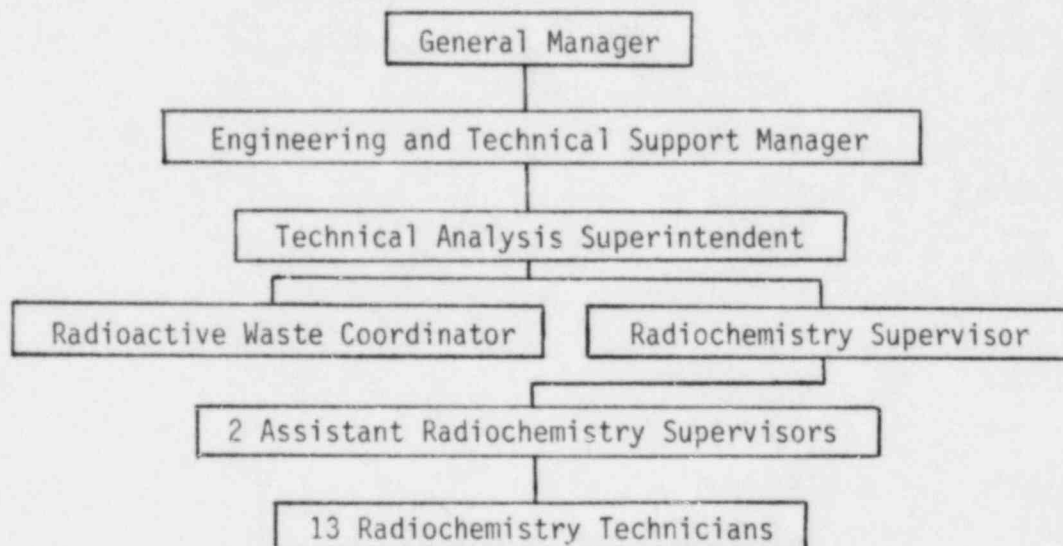
The NRC inspectors reviewed the licensee's functional organization regarding radioactive waste management to determine compliance with Technical Specification commitments.

#### Documents Reviewed

- Arkansas Nuclear One (ANO) Units 1 and 2 Technical Specifications, Licenses DPR-51 and NFP-6
- ANO Administrative Procedure 1000.01, "Organization and Responsibility"

#### Organization

The organization for ANO radioactive waste activities at the time of this inspection is depicted by the following chart:



The radiochemistry staff appeared to be sufficient to meet the staffing requirements for routine performance of radioactive waste activities. The licensee is currently seeking a qualified individual to fill a vacant radiochemistry position. Two radiochemistry technicians will purportedly terminate sometime this summer and the licensee recognizes the need for their replacement.

The NRC inspectors noted that, in general, the duties and responsibilities of the radiochemistry staff were not described in the position descriptions. However, the radiochemistry supervisor position description had been completed. This area was identified and discussed in NRC Inspection Report 313/8212.

No violations or deviations were identified.

6. Radiochemistry Personnel Selection, Qualification and Training

Documents Reviewed

- ANO Procedure 1023.05, "On-The-Job Training Program"
- ANO On-The-Job Training Manuals
- ANO General Employee Technical Support Training Plans
- ANSI N18.1-1971, "Selection of Personnel for Nuclear Power Plants"
- Regulatory Guide 1.8, "Personnel Selection and Training"

a. Personnel Selection and Qualification

ANO has no formal written criteria for personnel selection. ANO has informal guidelines that meet the recommendations of ANSI N18.1. This area was identified and discussed in NRC Inspection Report 313/8212.

The NRC inspectors verified through review of radiochemistry personnel experience resumes that the radiochemistry personnel had obtained academic education through a bachelor of science degree, which was consistent with the informal guidelines used in the licensee's personnel selection.

No violations or deviations were identified.

b. Training Program

The NRC inspectors verified through review of training records that radiochemistry personnel had completed the licensee's general employee training. Records of on-the-job training revealed that the technicians had either completed or were in some phase of the on-the-job training program.

Periodically the radiochemistry supervisory personnel counsel with the radiochemistry technicians regarding on-the-job activities to determine what phase of the on-the-job training the technician is assessed. A task is performed with the technician as an observer; the technician then performs that task with a qualified individual observing him and the task is performed independently by the technician.

No violations or deviations were identified.



## 7. Radioactive Effluent Releases

### a. Liquid

#### Documents Reviewed

- Procedure 1104.20, "Clean Waste System Operation," Attachment K, "Liquid Radwaste Release Permit"
- Preliminary Report (Computer Printout), "Liquid Release Report"
- Final Report (Computer Printout), "Liquid Release Report"
- Procedure 1604.017, "Analysis of Liquid Waste"
- Procedure 1042.002, "QC Guidelines and Acceptance Criteria"

The NRC inspectors reviewed records of liquid effluent releases to determine compliance with items 2.4, 2.4.1, and Table 2.2 and items 2.2, 2.2.1 and Table 2-1 of the ETS for ANO Units 1 and 2, respectively.

No violations or deviations were identified.

### b. Gaseous

#### Documents Reviewed

- Procedure 1104.33, Attachment C, "Reactor Building Purge Gaseous Release Permit"
- Preliminary Report (Computer Printout), "Gaseous Release Permit"
- Final Report (Computer Printout), "Gaseous Release Permit"

The NRC inspectors reviewed records of gaseous effluent releases to determine compliance with items 2.4, 2.4.2, and Table 2.2 and items 2.2, 2.2.2, and Table 2-1 of the ETS for ANO Units 1 and 2, respectively.

No violations or deviations were identified.

## 8. Records and Reports of Radioactive Effluents

The NRC inspectors reviewed records and reports required by 10 CFR 50.36a(a)(2), and ETS 5.6.1 and 6.9.1.4 for ANO Units 1 and 2, respectively, for content and format. The NRC inspectors noted that the licensee's annual reports conformed to the format recommended in Regulatory Guide 1.21, Revision 0.

No violations or deviations were identified.

## 9. Controls for Effluent Releases

### Documents Reviewed

- Procedure 1104.20, Attachment K, "Liquid Radwaste Release Permit"
- Preliminary and Final Reports (Computer Printouts), "Liquid Release Report"
- Procedure 1104.33, Attachment C, "Reactor Building Purge Gaseous Release Permit"
- Preliminary and Final Reports (Computer Printouts), "Gaseous Release Report"

The NRC inspectors reviewed the licensee's procedures for controlling liquid and gaseous releases to determine compliance with ETS 5.5 and 6.8.1. The liquid and gaseous release permit program records indicated that the following items are verified:

- Technical Specification limits
- Radiochemistry analyses results
- Function tests of liquid/gas monitors and isolation valves
- Allowable release rate
- Dilution flow rate
- Valve lineup verification
- Total volume released
- Total activity released
- Duration of release
- Authorization signatures

No violations or deviations were identified.

## 10. Air Cleaning Systems

The NRC inspectors reviewed test results for the HEPA filters and charcoal adsorber banks to determine compliance with Technical Specifications 3.9, 3.13, 3.14, 3.15, 3.22, 4.10, 4.11, 4.12, 4.17, and 4.25.

### Documents Reviewed

- Procedure 1802.06, "In-Place Leak Testing of Ventilation System Containing HEPA and Carbon Filters," Revision 0, May 13, 1981.
- Procedure 1802.01B (Unit 1), "Weekly Air Purification System Technical Specification Surveillance"
- Procedure 1802.01D (Unit 2), "Weekly Air Purification System Technical Specification Surveillance"

The NRC inspectors reviewed the licensee's test results for the following air cleaning systems specified in Technical Specifications:

- Control Room Emergency Air Conditioning and Isolation System
- Penetration Room Ventilation System
- Hydrogen Purge System
- Fuel Handling Area Ventilation System
- Reactor Building Purge Filtration System

No violations or deviations were identified.

## 11. Effluent Control Instrumentation

### Documents Reviewed

- Procedure 2304.26, "Process Radiation Monitoring System Test," Revision 1, March 26, 1981
- Procedure 2304.27, "Process Radiation Monitoring System Calibration," Revision 1, October 2, 1979

The NRC inspectors reviewed calibration and functional test records for the following liquid and gaseous monitors to determine compliance with Technical Specifications 2.4.2.1, 2.4.2.2, and Table 4.1-1:

<u>Monitor</u>	<u>Identification</u>
Gaseous Radwaste	RI-4830
Failed Fuel	RI-1237
Liquid Radwaste	RI-4642
Discharge Flumes	RI-3618
Stack	RI-7400
Hydrogen Purge (Lead)	RI-7441
Hydrogen Purge (Standby)	RI-7442
Emergency Penetration Room Vent (North)	RI-2120
Emergency Penetration Room Vent (South)	RI-2130
Gas Decay Tanks Ventilation Gas	2RITS-2429
Control Room Inlet Air Radiation	2RITS-8750-1
Hydrogen Purge/Containment Air	2RITS-8231-1B
Hydrogen Purge/Containment Air	2RITS-8271-2B
Auxiliary Building External Ventilation Gas	2RITS-7828
Containment Purge Radio-Gas	2RITS-8233
Radwaste Area Ventilation	2RITS-8542
Fuel Handling Area Ventilation	2RITS-8540
Penetration Room (North) Gas Discharge	2RITS-8845
Penetration Room (South) Gas Discharge	2RITS-8846
BMS/WMS Liquid Discharge	2RITS-2330

The instrument and control section of the maintenance department is responsible for the calibrations and functional tests associated with the procedures listed above.

No violations or deviations were identified.

## 12. Reactor Coolant Water Quality

### Documents Reviewed

- Procedure 1604.006, "Determination of Low Chloride-Specific Ion Electrode Method," Revision 1, February 8, 1982
- Procedure 1604.024, "Detection of Total Gas in Reactor Coolant," Revision 2, February 8, 1982
- Procedure 1604.027, "Detection of Fluoride-Specific Ion Electrode Method," Revision 1, February 8, 1982
- Procedure 1604.030, "Detection of Boron High Range," Revision 1, February 8, 1982
- Procedure 1607.001, "Reactor Coolant Sampling System," Revision 6, February 8, 1982

- Procedure 1617.001, "In-Line Monitoring of pH and Boron Concentrations," Revision 0, February 11, 1982
- Procedure 2604.024, "Detection of Total Gas in Reactor Coolant," Revision 2, February 8, 1982
- Procedure 2607.001, "Unit 2 Reactor Coolant System Sampling," Revision 4, February 8, 1982

The NRC inspectors reviewed sampling and analysis results of reactor coolant water quality to determine compliance with Technical Specifications 3.1.4, 3.1.5, 3.10, and Table 4.1-3.

No violations or deviations were identified.

### 13. Radiochemistry Quality Control (QC)

#### Documents Reviewed

- Procedure 1042.002, "Quality Control and Acceptance Criteria"
- Procedure 1604.001, "Gross Alpha Measurement"
- Procedure 1604.004, "Liquid Scintillation Counting for Gross Beta and Tritium Measurement"
- Procedure 1604.005, "Gross Gamma Activity Measurement"
- Procedure 1604.022, "Use of ND-6620 for Radiochemistry"
- Procedure 1604.023, "Test and Adjustment of Ge(Li) and HPGE Counting Electronics and Detectors"

The NRC inspectors reviewed the licensee's radiochemistry QC program. It appeared that the licensee had maintained an adequate QC program as outlined in the above-listed procedures. However, individual calibration procedures have not been completed for various counting instruments; therefore, such items as detailed procedures, calibration frequencies, procurement and preparation of counting standards were not always specified. This area was identified, discussed and included as an open item in NRC Inspection Report 313/8212.

No violations or deviations were identified.

#### 14. Audits of Radiochemistry Activities

##### Documents Reviewed

- . Quality Assurance Procedure, QAP-17, "Environmental Monitoring"
- . Quality Assurance Procedure, QAP-22, "Chemistry"

The NRC inspectors reviewed reports of audits performed by the licensee of radiochemistry activities. The licensee's records indicated that the plant QC staff and the Safety Review Committee (SRC) conducted audits of radiochemistry activities on the following dates:

October 14 to November 17, 1981, plant QC  
September 22 to October 10, 1981, SRC

The audit reports did not reveal any significant problem areas.

No violations or deviations were identified.

#### 15. Transportation Activities

The NRC inspectors reviewed the licensee's transportation activities to determine compliance with 10 CFR Parts 20, 71, and 49 CFR Parts 0 through 199, and the recommendations of Regulatory Guides 7.3 and 8.27, and NUREG-0761 (Draft).

##### Documents Reviewed

- . ANO Station organization chart dated June 4, 1982
- . Memorandum ANO-81-5411, "Arkansas Nuclear One Emergency Planning Emergency Response Organization Position Assignment," dated June 30, 1981.
- . Memorandum ANO-80-4549, "Arkansas Nuclear One I&E Bulletin 79-19, Responsibility for Radwaste," dated October 6, 1980
- . Form No. 1023.05B, "O.J.T. Tasks," Revision 0
- . ANO Memorandum Serial Number ESD-82-10, "Management Directive - Radioactive Waste Management," dated February 10, 1982
- . Procedure 1622.027, "Segregation and Compaction of Radioactive Waste," Revision 0, dated June 10, 1982, not issued.

- Procedure 1000.040, "Solid Radioactive Waste Management Program," Draft Revision 1, dated April 21, 1982
- Procedure 1603.006, "Disposal of Spent Radioactive Resin," Draft Revision 1, dated March 4, 1982.
- Procedure 1603.003, "Radioactive Material Shipments," Revision 4, dated August 11, 1981
- Procedure 1603.004, "Curie Content of Radioactive Waste Containers" Revision 0, dated August 3, 1981
- Procedure 1603.005, "Notification of Radioactive Material Shipments," Revision 1, dated September 10, 1981
- Procedure 1603.06, "Solidification of Spent Resin," Revision 0, dated February 16, 1981
- Procedure 1603.007, "Control of Radioactive Material," Revision 2, dated April 17, 1982
- Procedure 1603.009, "Classification and Marking of Radioactive Material" Revision 0, dated August 6, 1981
- Procedure 1603.010, "Handling of Radioactive Material Containers" Revision 0, dated October 27, 1981
- ANO Memorandum Serial No. SQA-1076, Subject: Operating Plant Surveillance Audit Radwaste Management (QAP-12), dated December 7, 1981
- Audit Checklist No. QAP-12, Subject: Radwaste Management
- Form QC-17 - Checklist No. HP-u8, Revision 0, "Greater than Type A Quantity Radwaste Shipment Inspection," dated December 2, 1981
- Job Description No. 0337 Location 710 for Radwaste Coordinator.
- Radioactive Material Shipment Records for July 1981-June 24, 1982
- ANO Training Course No. AT-10100-001 "Radwaste Management Training - Regulations," draft, Revision 0, undated
- ANO Training Course No. AT-10100-002, "Radwaste Management Training - Radioactive Material Control," draft, Revision 0, undated

- ANO Training Course No. AT-10100-003, "Radwaste Management Training - Liquid Waste Management," draft Revision 0, undated
  - ANO Training Course No. AT-10100-004, "Radwaste Management Training - Gaseous Waste Management," draft, Revision 0, undated
  - ANO Training Course No. AT-10100-05, "Radwaste Management Training - Solid Waste Management," draft, Revision 0, undated
  - ANO Training Course No. AT-10100-006, "Radwaste Management Training - Shipment of Radioactive Materials," draft, Revision 0, undated
  - ANO Procedure No. 1602.48, "Purchasing and Receipt of Radioactive Material," Revision 0, dated December 4, 1979
- a. Radioactive Material Transporting and Receiving Program

The NRC inspectors reviewed the licensee's radioactive material transporting and receiving programs. The licensee had designated the position of Radwaste Coordinator as the person responsible for the safe transfer, packaging and transport of low-level radioactive material. The receipt of radioactive material is under the cognizance of the HP Department, as is the packaging of compactible and noncompactible waste.

The receipt of radioactive material by the licensee appears to satisfy the requirements of 10 CFR 20.205.

The NRC inspectors are concerned that the ANO employee currently assigned the duties of radwaste coordinator has tendered his resignation effective July 21, 1982, and the licensee has not selected a qualified replacement. Furthermore, the NRC inspectors noted that this position has had a high turnover rate during the last 2 years. Discussions with ANO employees and observations by the NRC inspectors indicated that very little management attention or support for the radwaste coordinator position had been given in the past. The NRC inspectors noted during the preparation of radioactive material for offsite shipment that the radwaste coordinator performed mostly technician-type duties and that there was no immediate management control or quality control oversight of his functional performance. The radwaste coordinator position is covered by a lengthy position description, which includes vague qualification recommendations. This position description requires substantial supervisory and managerial abilities. Since the position of radwaste coordinator is essentially a one-man operation, many critical elements, such as development of procedures, providing in-house training, and maintenance of the material stored in the radioactive waste storage building (RWB), are not being properly



accomplished. The NRC inspectors did not investigate the corporate-level involvement in onsite transportation activities. This area will be addressed in a later inspection. This item (313/8214)/(368/8211)-(01) is considered open pending licensee actions in the following areas:

- Establishment of definitive qualification criteria for the position of radwaste coordinator
- Selection and training of a qualified radwaste coordinator replacement.
- Evaluation of the permanent staffing needs for the radwaste coordinator section.
- Providing management oversight to radioactive material packaging and transportation activities

b. Radioactive Waste Training

The NRC inspectors reviewed the licensee's training program for radioactive waste reduction and transportation of radioactive materials. The NRC inspectors determined that the licensee did not have a functional training program for these areas. The NRC inspectors did however note the formulation of several draft procedures and training plans for the above-noted activities. Licensee training for the radwaste coordinator had only involved a 3-day DOT and NRC transportation regulations course given by a contractor. The radwaste coordinator's on-the-job training (OJT) checklist appeared to cover essentially all aspects of licensee activities involving radioactive material transportation. However, none of the items were signed off or readied for signoff. The radwaste coordinator possessed sufficient knowledge and experience to carry out assigned tasks. This item (313/8214)/(368/8211)-(02) is considered open pending licensee action to implement suitable training and retraining programs for personnel involved in the transfer, packaging, and transportation of radioactive materials, and in the reduction of solid waste generation and development of radwaste coordinator qualification criteria.

c. Records

The NRC inspectors reviewed licensee's radioactive material shipping and receiving records for the period July 1981-June 23, 1982. The receipt inspection of radioactive materials is under the cognizance of the HP department and appears to satisfy the requirements of 10 CFR 20.205.

The offsite shipment records were found to be lacking in sufficient detail to allow expedient determination as to whether or not shipments made conformed to NRC and DOT regulations. Otherwise they

appear to meet NRC and DOT regulations as to required information. The NRC inspectors determined that four shipments of radioactive materials, three as Type A quantities in normal form via nonexclusive use carrier and one as Type A quantity in special form via nonexclusive use carrier, were offered for transport in containers as noted below:

<u>Date</u>	<u>RSR No.</u>	<u>Type Shipment</u>	<u>Container Used</u>
October 5, 1981	126-81	Type A Quantity-Special Form-gas	Stainless Steel Canister in strong type wooden box
October 5, 1981	127-81	Type A Quantity-Normal Form-RCP Seal Rings	Strong Tight Container
November 24, 1981	144-81	Type A Quantity-Normal Form-Anti-Contamination Clothing	DOT 17H Drum
June 3, 1982	37-82	Type A Quantity-Normal Form-Filters	DOT 17H Drum

The licensee believed the shipping containers met or exceeded DOT 7A general specifications for shipment of Type A quantities of radioactive materials, but could not produce complete certification and supporting safety analysis demonstrating that the construction methods, packaging design, and materials of construction are in compliance with the DOT 7A specifications. Therefore, the shipments were not made in compliance with 10 CFR 71.5, 49 CFR 173.394, and 173.395. (313/8214)/(368/8211)-(23)

d. Shipments

The NRC inspectors observed the preparations for three shipments of low-level radioactive waste (LSA-Greater than Type A quantities). The licensee's, as-built, waste solidification system, ureaformaldehyde, is nonoperational and the licensee has been granted approval by burial site contractors to ship resins and filter elements to them, when dewatered in accordance with specific procedures. The NRC inspectors noted that all operations appeared to be performed satisfactorily even though the specific procedures (contractor provided) for dewatering the resins and filters were not incorporated into station-approved procedures. Most radioactive material shipments are radioactive waste made as LSA materials greater than Type A quantities in liners within NRC specification containers.

The NRC inspectors noted that there was no evidence of any QC inspections applied to intermediate packagings placed within shielded casks during filling or sealing of the liners. Furthermore, it was determined that independent QC inspections are only provided, per a very general checklist, for shipments involving quantities greater than Type A. It is evident from the violation noted above that additional areas of the station's transportation activities are in need of additional quality control attention.

The majority of the licensee's shipments consist of LSA materials greater than Type A quantities shipped via sole use carrier. No liquids, fuel or plutonium have been shipped by the licensee. Since both waste compaction machines were down for repairs, no waste drums were opened for inspection. The licensee stated that waste compactor operators are instructed to inspect waste bags for liquid prior to compaction and a specific amount of absorbent is added to each drum, DOT 17H 55-gallon specification, prior to filling for residual liquid absorption. Draft procedures for waste compaction do not address this aspect.

This item (313/8214)/(368/8211)-(03) is considered open pending licensee actions to:

- Establish procedures covering all aspects of radioactive material packaging and transportation activities, including preparation of resins and filter elements for shipment.
- Establish quality assurance controls over all forms of packaging materials and radioactive material shipments to ensure all aspects of DOT and NRC regulations pertaining to the shipment of radioactive materials are complied with.

e. Packaging

The NRC inspectors noted during the packaging of spent filter elements within NUPAC Type III (DOT 7A) liners that the only method used to seal the top opening was the applying of a continuous bead of RTV sealant around the top opening cover edge, a circular 1/4-inch-thick steel plate. The shipment was classified as LSA materials greater than Type A quantity and shipped by exclusive use carrier. The liner containing the filters was placed within an NRC-certified shielded container to meet LSA materials external radiation levels. In accordance with 49 CFR 173.392, the filter elements need only be shipped in strong tight containers; furthermore, NRC requires that LSA shipments exceeding Type A quantities be contained within an NRC-certified container. The NRC inspectors are concerned that the method used to close the inner container may not provide positive closure during transportation and, upon opening of the NRC-certified container by the consignee, may release radioactive materials/contamination that spilled out of the inner container during transport.

This item (313/8214)/(368/8211)-(04) is considered open

pending licensee evaluation of closure methods used on the NUPAC liners when they contain dewatered materials.

f. Procedures

The NRC inspectors reviewed the licensee's procedures for the packaging and shipment of radioactive materials. The NRC inspectors are concerned that certain aspects of spent resin and filter element dewatering, liner closure, and curie estimate are not performed in accordance with licensee-approved procedures.

The NRC inspectors' review of available licensee procedures for radioactive material transportation and waste handling revealed the following deficiencies:

- Procedure No. 1000.40, "Solid Radioactive Waste Management Program" draft, Revision 0, dated April 21, 1982

Overall this is a well-written and concise document and provides a substantial foundation for a radioactive waste program. However, paragraph 9.5 only requires quality control inspections on shipments involving radioactive materials in quantities greater than Type A quantities which eliminates several other types of shipments that appear to require QA aspects to ensure appropriate NRC and DOT regulations are met.

- Procedure No. 1622.027, "Segregation and Compaction of Radioactive Waste," draft, Revision 0, dated May 19, 1982

This procedure was approved by the Plant Safety Review Committee on June 23, 1982, and scheduled for distribution on or about June 28, 1982. The NRC inspectors are concerned that this procedure was not afforded review by the radwaste coordinator or the licensee's quality control organization. The NRC inspectors noted that this procedure does not provide for certain procedural controls to ensure that the integrity and identity of the selected drums are maintained. The licensee should include visual inspections that will ensure that the drums are the proper type, all necessary accessories are present and undamaged, and the drum has not been damaged during transport or as a result of handling at the plant. Also, no instructions are presented on the methods to be employed to ensure liquids are not loaded into the drums in excess quantities. This procedure does not provide for the proper installation of the lid, gasket and locking ring, in that no gaskets are required to be installed which are required by 49 CFR 178.118, "Specification 17H; Steel Drum."

- Procedure No. 1603.006, "Disposal of Spent Radioactive Resin," draft, Revision 1, dated March 18, 1982

The NRC inspectors are concerned that this procedure has not been approved and implemented yet, since it covers radioactive material processing activities currently being accomplished by the licensee but not contained in licensee-approved procedural form or in Procedure No. 1603.06, "Solidification of Spent Resin," Revision 0, dated February 16, 1981.

- Procedure 1603.003, "Radioactive Materials Shipments," Revision 4, dated August 11, 1981

The procedure references use of Procedure 1603.008, "Quality Control of Radioactive Material Shipments"; however, this procedure could not be produced for the NRC inspectors by the licensee. This procedure and forms do not provide sufficient information to ensure determinations for classifying radioactive materials shipments as meeting Low Specific Activity criteria and the recording of methods/calculations used in the determination. This procedure only addresses shipments of radioactive waste which exclude instructions for normal form, exempt, special form and limited quantity shipments, of which the licensee has made in the past.

The forms provided for radioactive material shipments do not provide for a quality control type review of data by a more senior person than the one filling out the form. ANO Form 1603.003A, "Radioactive Shipment Checklist and Shipping Papers," does not provide sufficient information for the determination that a specific shipment was properly packaged or, if applicable, shipped in an NRC or DOT specification container.

- Procedure No. 1603.005, "Notification of Radioactive Material Shipments," Revision 1, dated September 10, 1981

This procedure does not provide for the notification of the consignee of any special loading/unloading instructions prior to licensee's first shipments as required by 49 CFR 173.22.

- Procedure No. 1603.007, "Control of Radioactive Material" Revision 2, dated April 17, 1982

Instructions do not provide for the maintenance of radioactive material (information) labels on stored items to ensure the provisions of 10 CFR 20.203(f) are met:

Procedure No. 1603.009, "Classification and Marking of Radioactive Material," Revision 0, dated August 6, 1981

The NRC inspectors noted that the paragraph 6.1.2 limits on LSA materials is a factor of 1000 times higher than those given in 10 CFR 71.4 or 49 CFR 173.389 for certain transportation groups.

Also, the limits given in paragraph 6.1.4 for Type B quantities are 50 times lower for transport Groups VI and VII radionuclides than those presented in 10 CFR 71.4 and 49 CFR 173.389.

This item (313/8214)/(368/8211)-(05) is considered open pending licensee action on improvement in and implementation of procedures covering radioactive material transportation and waste packaging.

g. Storage Building

The licensee's radioactive material storage building (RWB) is a steel framed sheet metal covered building located approximately 100 yards south of the turbine building's large vehicle bay. The building is provided with perimeter drain troughs that feed into a liquid sump that is in turn connected to the plant radwaste system piping. The building is filled near capacity with radioactive wastes and some reusable equipment. Approximately one-third of the material within the building is comprised of materials of unknown origin or in packages/containers not suitable for shipment. Approximately 2,000 gallons of radioactive liquids, remainder of the 5,000 gallons discovered during the QA audit of December 1981, that must be prepared for shipment. Stored outside of the building are approximately 100 55-gallon drums of used anti-contamination clothing awaiting shipment to a soon-to-be-opened laundry facility in Mississippi. The radwaste coordinator indicated he is attempting to reduce the inventory of items but manpower limitations are hampering his plans. Labeling of materials within the building appear satisfactory; however, marking and labeling of items outside are marginal due to environmental exposure of tags and labels.

Access to the RWB and the fenced-off area surrounding it is under the station's RWP system. Posting of the area appeared satisfactory during this inspection. The QA audit of December 1981 caused the RWB to be upgraded in housekeeping and fire protection considerations.

This item (313/8214)/(368/8211)-(06) is considered open pending licensee completion of disposal of radioactive liquids identified in the onsite QA audit and implementation of detailed plans on the reduction of radioactive materials in storage.

#### h. QA Audits

The licensee's onsite QA audits appear to be well-planned and performed. The radwaste management audit (QAP-12) of December 1981 was quite extensive and actions to correct deficiencies identified were expediently pursued by station managers. The NRC inspectors noted that a person experienced in aspects of health physics and radioactive material transportation activities was not included in the team, and that audited items only covered requirements of station procedures in the area of transportation activities and did not verify compliance with NRC and DOT regulations, which are not adequately covered in station procedures for transportation activities.

This item (313/8214)/(368/8211)-(07) is considered open pending:

- Completion of corrective actions for the December 1981 onsite QA audit of Radwaste Management.
- Expanding audit program in the area of radioactive material transportation activities and including a team member, in future audits, with health physics or radioactive material transportation expertise.

#### 16. NUREG-0737, "Clarification of TMI Action Plan Requirements"

The NRC inspector reviewed the licensee's progress and commitment in meeting the post-TMI requirements according to NUREG-0737 for:

Item II.B.2, "Design Review of Plant Shielding and Environmental Qualification of Equipment for Spaces/Systems which may be Used in Postaccident Operation."

Item II.B.3, "Postaccident Sampling Capability"

Item II.E.4.2, "Containment Isolation Dependability, Position (7), Containment Purge and Vent Isolation Valves Must Close on a High Radiation Signal"

Item II.F.1, "Additional Accident Monitoring Instrumentation"

Attachment 1, "Noble Gas Effluent Monitor"

Attachment 2, "Sampling and Analysis of Plant Effluents"

Attachment 3, "Containment High-Range Radiation Monitor"

Item III.D.3.3, "Improved Inplant Iodine Instrumentation Under Accident Conditions"

Item III.D.3.4, "Control-Room Habitability Requirements"

a. Item II.B.2, "Design Review of Plant Shielding and Environmental Qualification of Equipment for Spaces/Systems which may be Used in Postaccident Operation"

(1) Documents Reviewed

- (a) Letter, September 13, 1979, to all Operating Nuclear Power Plants from D. G. Eisenhut (USNRC)
- (b) Letter, October 30, 1979, to all Operating Nuclear Power Plants from H. R. Denton (USNRC)
- (c) Letter, November 20, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (d) Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (e) Letter, January 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (f) Letter, February 29, 1980, D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (g) Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Reid (USNRC)
- (h) Letter, March 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (i) Letter, October 7, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (j) Letter, October 27, 1980 to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (k) Letter, December 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (l) Letter, November 30, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)



- (m) Letter, May 17, 1982, to D. G. Eisenhut (USNRC) from J. R. Marshall (ANO)
- (n) Report, "Design Review of Plant Shielding and Sampling Sampling Capabilities in Response to NUREG-0578," NUS-3504.
- (o) Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant for Pressurized Water Reactors"
- (p) Standard Review Plan 15.6.5, "Radiological Consequences of a Design Basis Loss-of-Coolant Accident: Leakage from Engineered Safety Features Components Outside Containment"
- (q) Title 10, Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants 19 - Control Room."
- (r) ANO Procedure 1202.04, "Reactor Turbine Trip"
- (s) Standard Review Plan, Section 6.4, "Habitability Systems"

(2) Discussion

A contracted study which culminated in a report, see (1)(k) above. [Documents Reviewed (k)]. This report assumed a postaccident release of radioactivity equivalent to that given in Regulatory Guide 1.4 and also identified the vital plant areas.

The licensee's efforts appeared to meet the requirements of item II.B.2, except for areas mentioned in the following results:

(3) Results

The dose rate calculations for the control room were not performed to determine if the NUREG-0737 recommendation of less than 15 mRem/h over a 30-day period was met. The licensee indicated these computations would be made within 30 days. This is considered an open item (313/8214)/(368/8211)-(08) pending the satisfactory completion of these calculations.

To meet certain NUREG-0737 recommendations of a vital area, it was required that procedural changes be made to warn against the use of the decay heat removal systems in ANO Unit 1 where significant core damage had resulted from an accident. A letter (see (1)(1) above) stated that these changes had been made. Contrary to this statement, these procedural changes had not been made. This is considered a deviation.

(313/8214-24)

The Radiation Qualification of Safety-Related Equipment part of this NUREG-0737 item was not reviewed by the NRC inspector. This is considered an open item (313/8214)/(368/8211)-(22) and will be reviewed during a subsequent inspection.

No violations were identified.

b. Item II.B.3, "Postaccident Sampling Capability"

(1) Documents Reviewed

- (a) Letter, October 17, 1979, to D. G. Eisenhut (USNRC) from Cavanaugh, III (ANO)
- (b) Letter, October 30, 1979, to all Operating Nuclear Power Plants from H. R. Denton (USNRC)
- (c) Letter, November 20, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (d) Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (e) Letter, January 31, 1979, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (f) Letter, February 29, 1980, D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (g) Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Reid (USNRC)
- (h) Letter, October 7, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (i) Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (j) Letter, November 30, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (k) Letter, December 21, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (l) Letter, March 9, 1982, to W. C. Seidle (USNRC) from J. R. Marshall (ANO)
- (m) Letter, May 17, 1982, to D. G. Eisenhut (USNRC) from J. R. Marshall (ANO)

- (n) Letter, June 18, 1982, to J. T. Collins (USNRC) from J. R. Marshall (ANO)
- (o) ANO Procedure 1617.001, "Inline Monitoring of Chloride Ion Concentration for Reactor Coolant"
- (p) ANO Procedure 1617.002, "Use of Unit 1 ND/APT Grab Sampler"
- (q) ANO Procedure 1617.003, "Use of the ND-6620 for On-Line Chemical and Radiochemical Analysis"
- (r) ANO Procedure 1617.004, "Use of the Unit 2 ND/APT Grab Sampler"
- (s) ANO Procedure 1617.005, "On-line Oxygen Analysis for Unit 1"
- (t) ANO Procedure 1617.006, "On-line Oxygen Analysis for Unit 2"
- (u) ANO Procedure 1617.007, "On-line Reactor Coolant H<sub>2</sub> Analysis for Unit 1"
- (v) ANO Procedure 1617.008, "On-line Reactor Coolant H<sub>2</sub> Analysis for Unit 2"
- (w) ANO Procedure 1617.009, "Panel 2C357 Valve Alignment"
- (x) ANO Procedure 1617.011, "In-line Monitoring of pH and Boron Concentration for Reactor Coolant"
- (y) ANO Procedure 1617.101, "Sampling with the Super Particulate Iodine Noble Gas Monitor (SPING)"
- (z) ANO Procedure 1617.102, "Using the ND-6650 and the Extended Range" Gaseous Effluent Radiation Monitoring System"
- (aa) ANO Procedure 1617.103, "Gaseous Release Using the Super Particulate Iodine Noble Gas Monitors"
- (bb) ANO Procedure 1304.137, "Calibration of GERMS for Containment Purge, Reactor 9820"
- (cc) ANO Procedure 1304.138, "Calibration of GERMS for Radwaste Area, Reactor 9825"

- (dd) ANO Procedure 1304.139, "Calibration of GERMS for Fuel Handling Area, Reactor 9830"
  - (ee) ANO Procedure 1304.140, "Calibration of GERMS for Emergency Room Penetration Vent, Reactor 9835"
  - (ff) ANO Drawings No. M-237, Sheet 2 (Unit 1) and M-2237, Sheet 4 (Unit 2).
  - (gg) Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss-of-Coolant Accident for Pressurized Water Reactors"
  - (hh) Title 10, Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants 19 - Control Room"
  - (ii) Regulatory Guide 1.97, "Instrumentation for Light Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident"
  - (jj) ANSI N13.1, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities"
- (2) Discussion

The NRC inspectors reviewed the capability of the licensee to analyze the reactor coolant and containment atmosphere within 3 hours and were assured this was easily attainable. The in-line monitoring system (part of the Postaccident Sampling System (PASS)) does not require any isolated auxiliary system to be placed in operation. It appears that the individuals analyzing the coolant and containment atmosphere will not receive exposures exceeding the criteria of GDC 19 (Appendix A, 10 CFR Part 50; i.e., 5 Rem whole body, 75 Rem extremities). The PASS has the capability to obtain a liquid grab sample automatically. The sensitivity of the liquid analysis allows a nuclide concentration measurement in the range from 0.2 uCi/cc to 10 Ci/cc. The calculated maximum exposure rate in the computer-analytical room of the PASS facility will be 15 mRem/h. A review of the flow diagram of PASS showed valves for the purging of the system to reduce plateout, prevent blockage of line, and flow restriction as well as isolation.

The Gaseous Effluent Radiation Monitoring System (GERMS) was designed to meet ANSI N13.1.

The chemical analysis aspects (Boron, Chlorine, pH, and Hydrogen) of Item II.B.3 were not inspected except for the document review, and that chloride analysis could be performed during one shift.

(3) Results

NUREG-0737 stipulates that the Postaccident Sampling and Analyzing Capability be implemented by January 1, 1982. The licensee is in the process of getting its capability completely operational. They have encountered analytical problems because of their computer software. The correspondence from the licensee to the NRC, 16.b.(1)(k),(l),(m), and (n), has informed the NRC of the problems involved in getting this system operational and that the implementation date would be later than January 1, 1982. The NRC inspectors were assured that the vendor was working diligently on this problem and would have this system operational shortly, but the licensee refrained from giving an estimate of the time involved. This is considered an open item (313/8214)/(368/8211)-(09) pending implementation of the system.

NUREG-0737 specifies that if inline monitoring is used for any sampling and analytical capability, the licensee shall provide backup sampling through grab samples, and shall demonstrate the capability of analyzing the samples. Established planning for analysis at offsite facilities is acceptable, but the licensee was unable to make available their contract with Oak Ridge National Laboratory for grab sample analysis. This is considered an open item (313/8214)/(368/8211)-(10) pending the licensee obtaining a copy of the contract for review.

The inspector did not review the ventilation exhaust system from the PASS facility to ascertain if it was filtered properly, i.e., HEPA filters, charcoal adsorbers, which is a requirement of NUREG-0737. This is considered an open item (313/8214)/(368/8211)-(21) pending a review of the exhaust system.

No violations or deviations were identified.

c. Item II.E.4.2, "Containment Isolation Dependability, Position (7) Containment Purge and Vent Isolation Valves Must Close on a High Radiation Signal"

(1) Documents Reviewed

- (a) Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (b) Letter, January 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (c) Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Reid (USNRC)
- (d) Letter, October 7, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (e) Letter, March 31, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (f) Letter, July 10, 1981, to W. Cavanaugh, III (ANO) from J. F. Stoltz (USNRC)
- (g) Letter, December 14, 1981, to W. Cavanaugh, III (ANO) from R. A. Clark (USNRC)
- (h) Letter, April 14, 1982, to W. Cavanaugh, III (ANO) from J. F. Stoltz (USNRC)
- (i) Letter, May 17, 1982, to D. G. Eisenhut (USNRC) from J. R. Marshall (ANO)
- (j) Technical Specification 3.23.1, Amendment 55 (Unit 1)
- (k) Technical Specification 3.6.1.6 (Unit 2)

(2) Discussion

Technical Specifications 3.23.1 and 3.6.1.6 require that the above valves be maintained closed except during cold shutdown.

(3) Results

No automatic isolation is required because the valves are maintained closed.

No violations or deviations were identified.

d. Item II.F.1, "Additional Accident Monitoring Instrumentation"(1) Attachment 1, "Noble Gas Effluent Monitor"(a) Documents Reviewed

- i. Letter, October 17, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- vi. Letter, February 29, 1980, D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- vii. Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Reid (USNRC)
- viii. Letter, October 7, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- ix. Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- x. Letter, November 30, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- xi. Letter, December 21, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- xii. Letter, May 17, 1982, to D. G. Eisenhut (USNRC) from J. R. Marshall (ANO)
- xiii. ANSI N13.1, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities"

(b). Discussion

The Super Particulate Iodine Noble Gas (SPING) monitors are a part of Eberline's SPING 4 Detector Microcomputer Controlled Radiation Monitoring System which is a component of the ANO GERMS system. These monitors have a range of  $1.1\text{E}-01$  uCi/cc to  $1.0\text{E}+05$  uCi/cc (Xe-133). The following SPING monitors are presently in service at Arkansas Nuclear One:

<u>SPING NUMBER</u>	<u>MONITOR NUMBER</u>	<u>VENTILATION SYSTEM</u>
1	RX-9820	Unit 1 Containment Purge
2	RX-9825	Unit 1 Radwaste Area
3	RX-9830	Unit 1 Fuel Handling Area
4	RX-9835	Unit 1 Emergency Penetration Room
5	2RX-9820	Unit 2 Containment Purge
6	2RX-9825	Unit 2 Radwaste Area
7	2RX-9830	Unit 2 Fuel Handling Area
8	2RX-9835	Unit 2 Emergency Penetration
9	2RX-9840	Unit 2 Post-Accident Sampling Building
10	2RX-9845	Unit 2 Auxiliary Building Extension

The sensitivity for these gas monitors is  $28 \pm 5.3 \text{ E}+06$  CPM/uCi/cc for Xe-133. This monitoring system samples every minute and transmits the data every 10 minutes to the computer.

The SPING and associated sampling apparatus of the GERMS are designed according to ANSI N13.1 and are powered from a vital buss. Each SPING has a local read-out and also a read-out in the Technical Support Center, Offsite Emergency Response Facility, Units 1 and 2 control rooms, and Post Accident Sampling Facility. The scale overlap for the low and medium ranges is approximately  $1.0\text{E}+02$  Ci/cc (maximum of low scale is  $4.3\text{E}-02$  uCi/cc and the minimum of the medium scale is  $9.2\text{E}-04$  uCi/cc).

The calibration schedule for the SPING monitors is on an annual basis and the calibration procedures are as follows:

- Procedure 1617.101, "Sampling with the Super Particulate Iodine Noble Gas Monitor (SPING)"
- Procedure 1617.102, "Using the ND-6650 and the Extended Range Gaseous Effluent Radiation Monitoring System"
- Procedure 1617.103, "Gaseous Release Using the Super Particulate Iodine Noble Gas Monitors"



- Procedure 1304.137, "Calibration of GERMS for Containment Purge, Reactor 9820"
- Procedure 1304.138, "Calibration of GERMS for Radwaste Area, Reactor 9825"
- Procedure 1304.139, "Calibration of GERMS for Fuel Handling Area, Reactor 9830"
- Procedure 1304.140, "Calibration of GERMS for Emergency Room Penetration Vent, Reactor 9835"

(c) Results

The scale overlap for the medium and high ranges had not been verified to meet the requirements of NUREG-0737. This is considered an open item (313/8214)/(368/8211)-(11) pending documentation of the overlap of the upper two scales.

(2) Attachment 2, "Sampling and Analysis of Plants Effluents"

(a) Documents Reviewed

- i. Letter, September 13, 1979, to all Operating Nuclear Power Plants from D. G. Eisenhut (USNRC)
- ii. Letter, October 30, 1979, to all Operating Nuclear Power Plants from H. R. Denton (USNRC)
- iii. Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- iv. Letter, January 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- v. Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Keid (USNRC)
- vi. Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- vii. Letter, March 31, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)

- viii. Letter, November 30, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- ix. ANSI N13.1-1969, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities"
- x. Title 10, Code of Federal Regulations, Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants 19 - Control Room"
- xi. ANO Procedure 1904.04, "Magnitude of Release"

(b) Discussion

The iodine gaseous effluent sampling and analysis capability is part of the GERMS. The locations of the SPING monitors are given in paragraph d(1)(b). The calibration procedure numbers are also given for GERMS in paragraph d(1)(b). The GERMS is capable of continuously monitoring for gaseous radioiodine and particulates. The detectors of the SPING are shielded with three inches of lead. The particulates are collected on a millipore filter and charcoal cartridges with a 98% effective adsorption for gaseous iodine. This system is operating and samples continuously and is designed per ANSI N13.1, but may not be operating accordingly. See results below. Procedure 1904.04 converts this collection data to release rate.

In an accident situation, the particulate filter and iodine cartridge will be retrieved via an approximate 400-lb. lead pig. The licensee is in the process of changing its procedures to use a silver-zeolite iodine cartridge for accident conditions instead of charcoal.

(c) Results

The NRC inspectors did not review the procedures of the filter and cartridge removal, subsequent replacement in the SPING and transport of these for analysis to determine if plant personnel dose would not be in excess of the GDC 19 criteria in accordance with NUREG-0737. This item will be reviewed during a subsequent inspection and is considered an open item (313/8214)/(368/8211)-(18) pending a completed review.

NUREG-0737 requires that the sampling of particulate and iodines be done isokinetically, but the licensee has not documented that the sample probes have the capability of maintaining isokinetic conditions with variations of air flow velocity of  $\pm 20\%$ . This is considered an open item (313/8214)/(368/8211)-(12) pending documentation of the above isokinetic capability.

According to NUREG-0737, provisions should be made to ensure that the adsorber is not degraded while providing a representative sample. The Units 1 and 2 Emergency Penetration Room sampling lines have experienced moisture in the sampled air which has degraded the charcoal cartridges. This is considered an open item (313/8214)/(368/8211)-(13) pending a system modification to prevent this moisture entrainment.

(3) Attachment 3, "Containment High-Range Radiation Monitor"

(a) Documents Reviewed

- i. Letter, September 13, 1979, to all Operating Nuclear Power Plants from D. G. Eisenhut (USNRC)
- ii. Letter, October 17, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- iii. Letter, October 30, 1979, to all Operating Nuclear Power Plant from H. R. Denton (USNRC)
- iv. Letter, November 20, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- v. Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- vi. Letter, October 7, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- vii. Letter, November 30, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- viii. Letter, January 12, 1982, W. Cavanaugh, III (ANO) from J. F. Stoltz (USNRC)
- ix. ANO Procedure 1304.133, "Containment High-Range Radiation Monitor"

- x. "Containment High Radiation Monitor and High-Range Gamma Monitoring System Operation and Maintenance Manual," E-115-876, General Atomic Company, August 1980
- xi. Unit 1 Radiation Zoning and Access Control Plan Drawing Numbers A-413 (Revision 6-1), and A-416 (Revision 5-1) for Elevations 354'-0" and 424'-6", respectively.

(b) Discussion

Two General Atomic Gamma Radiation Detectors (Model RD-23) were located in each of the containments of Unit 1 and 2 with their respective Readout Modules (Model RP-2C) located in Unit 1 and 2 control rooms. These detectors and readout modules were operating. The following readout modules were inspected in their respective control rooms:

Unit 1	RITS 8060	RITS 8061
Unit 2	2RITS 8925-1	2RITS 8925-2

The range of these containment monitors is from 1-1.0E+08 R/h for gamma radiation.

The monitors have been and will be calibrated during each unit's respective outage per Procedure 1304.133 with a 10 R/h Cs-137 source for the lower range and electronic calibration for the upper ranges.

The monitors in the containment of Unit 1 were physically widely separated so that a large fraction of the containment volume is monitored to give a reasonable assessment of the area radiation conditions.

(c) Results

The NRC inspectors did not review the documentation of the original calibration of this equipment for which NUREG-0737 states: "Prior to initial use, certify calibration of each detector for at least one point

per decade of range between 1 R/h and 1000 R/h." This is considered an open item (313/8214)/(368/8211)-(19) pending a review during a subsequent inspection.

NUREG-0737 states that the High-Range Radiation Monitors shall be located in containment in a manner as to provide a reasonable assessment to area radiation conditions inside containment. The licensee was unable to supply the necessary drawings for Unit 2 Containment; therefore, an assessment concerning the High-Range Radiation Monitors location was not performed. This is considered an open item (313/8214)/(368/8211)-(14) pending the review of Unit 2 drawings or visual inspection in containment of monitor's locations.

NUREG-0737 specifies design and qualification criteria to ensure that the monitor will function in an accident environment. The description of these monitors indicated they would function properly in an accident environment, but the licensee could not produce the design and qualification criteria. This is considered an open item (313/8214)/(368/8211)-(15) pending the documentation review.

From the requirements of NUREG-0737, these monitors should have a linear energy response of  $\pm 20\%$  for photons of 0.1 MeV. The licensee did not document any response data. This is considered an open item (313/8214)/(368/8211)-(16) pending review of documentation verifying the energy response.

e. III.D.3.3, "Improved Inplant Iodine Instrumentations Under Accident Conditions"

(1) Documents Reviewed

- (a) Letter, September 13, 1979, to all Operating Nuclear Power Plants from D. G. Eisenhut (USNRC)
- (b) Letter, October 17, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)

- (c) Letter, October 30, 1979, to all Operating Nuclear Power Plants from H. R. Denton (USNRC)
- (d) Letter, November 20, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (e) Letter, December 5, 1979, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (f) Letter, January 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (g) Letter, March 10, 1980, to W. Cavanaugh, III (ANO) from R. W. Reid (USNRC)
- (h) Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (i) Letter, December 31, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (j) Letter, July 10, 1981, to W. Cavanaugh, III (ANO) from J. F. Stoltz (USNRC)
- (k) ANO Procedure 1313.020, "Stabilized Assay Meter, SAM-2, Calibration"
- (l) ANO Procedure 1622.006, "Radiological Air Sampling Program"

(2) Discussion

The licensee has two analyzers, Eberline Model SAM-2 (Stabilized Assay Meter), used in conjunction with two sodium iodide detectors (2x2 NAI, TL), Model RD-22. The resolution of the detectors at FWHM is typically 13% for I-131 (364 KeV). The SAM-2 spectrometer is compact, lightweight, and stabilized to correct automatically for gain changes caused by environmental conditions, component aging, etc. It is a dual channel analyzer with scaler and ratemeter readout of the sum or difference of the two channels. It can be powered from AC line or external battery pack. One set of this equipment is in the Technical Support Center and the other in the Unit 1/2 control rooms. They are mounted in four-wheeled carts for portability.

The licensee has 11 Radeco portable air samplers; 4 H-809VI (110 volts), 5 H-809C (12 volt DC), and 2 H-809 B2 (Self-Contained Battery Pack).

A Scientific Applications Inc., silver-zeolite cartridge (Model No. 075017) is used in conjunction with the air samplers for iodine collection. This cartridge has a collection efficiency of approximately 99% for iodine and requires no flushing because it does not retain any noble gases. A 47mm Gelman glass fiber filter is used preceding the cartridge.

The SAM-2 analyzers are calibrated on an annual basis per Procedure 1313020 and the air samples are collected per Procedure 1622.006.

Twenty-three plant health physics personnel were trained on May 13-14, 1982, for Emergency Radiation Team procedures which included the use of the above-mentioned analyzers, detectors, cartridges, filters, air samplers, etc., and iodine determination.

### (3) Results

No violations or deviations were identified.

#### f. Item III.D.3.4, "Control-Room Habitability Requirements"

##### (1) Documents Reviewed

- (a) Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (b) Letter, December 19, 1980, to D. G. Eisenhut (USNRC) from W. Cavanaugh, III (ANO)
- (c) Letter, December 31, 1980, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (d) Letter, March 13, 1981, to D. G. Eisenhut (USNRC) from D. C. Trimble (ANO)
- (e) Letter, July 10, 1981, to W. Cavanaugh, III (ANO) from J. F. Stoltz (USNRC)
- (f) Standard Review Plan (SRP) 6.4, "Habitability Systems"

- (g) Standard Review Plan (SRP) 2.2.1-2.2.2, "Identification of Potential Hazards in Site Vicinity"
- (h) Standard Review Plan (SRP) 15.6.5, "Radiological Consequences of a Design Basis Loss-of-Coolant Accident": Appendix A, Containment Leakage Contribution and Appendix B, Leakage from Engineered Safety Features Components Outside Containment.
- (i) Regulatory Guide 1.78, "Assumptions for Evaluating the Habitability of Regulatory Power Plant Control Room During a Postulated Hazardous Chemical Release"
- (j) Regulatory Guide 1.95, "Protection of Nuclear Power Plant Control Room Operators Against an Accidental Chlorine Release"

(2) Discussion

Letter, see above Documents Reviewed (c), states that the licensee meets the recommendations of NUREG-0737, Item III.D.3.4, and letter, see above Documents Reviewed (d), gives a response to each listing in Attachment 1 of Item III.D.3.4. The licensee considers letter, see above Documents Revised (d), to be the requested accident-analysis results.

This item, Item III.D.3.4 of NUREG-0737, states under Clarification (2), "Licensees shall submit the results of their findings as well as the basis for these findings by January 1, 1981," and "Each licensee submittal shall include the results of the analysis . . ." in Clarification (3). Also, under the same section it states, "attachment 1 lists the information that should be provided along with the licensee's evaluation."

(3) Results

Letter, see above Documents Reviewed (d) gives the basis for findings or information from a reference viewpoint, but gives no analysis, results of analysis, or evaluation. This is considered an open item (313/8214)/(368/8211)-(17) pending completion of the necessary evaluation.



g. ANO NUREG-0737 Management Responsibility Assignments

The NRC inspectors did not determine if the responsibility for these NUREG items had been assigned to the proper ANO management. This is considered an open item (313/8214)/(368/8211) -(20) pending the review of assigned responsibility.

17. Exit Interview

The NRC inspectors met with those Arkansas Power and Light Company representatives denoted in paragraph 1 at the conclusion of the inspection on June 25, 1982, and September 17, 1982. The NRC inspectors discussed the scope and findings of the inspection.



ATTACHMENT B

OPEN ACTION ITEMS LIST

Date: 7/1/95  
 Ticket # 50-813  
 (8)

Type Code: A=Allegation  
 B=Bulletin  
 C=Circular  
 D=Deviation  
 E=50.55(e)  
 L=LER  
 M=Miscellaneous  
 O=Open Item  
 R=Part 21 Report  
 T=Temporary Instructions  
 U=Unresolved Item  
 V=Violation

Note - Max characters allowed for each entry shown in (1)

1	2	3	4	5	6	7	8
Type	Item No.	Report Paragraph	Responsible Section	Module	Description	Update/Closeout Report	Status Code
(1)	(8)	(6)	(4)	(7)	(186)	(30)	(1)
V	7811-	12	T-RP	84710	containing... material for liquid... cartridges.	8214	C
V	7811-01	4.1	T-RP	84710	Radioactive... exceeding... limits.	8214	C
V	8102	4	T-RP	86710	Information on... for shipment.	8214	C
M		6.2.1	T-RP	83720	Significant... radiation... procedures.	8214	
V	8020	6.2.2	T-RP	85720	Significant... radiation... procedures.	8214	C
V	8211-3	16.0	T-RP	86710	Investigation of... material.		

Note - Max Characters allowed for each entry shown in (1)

1	2	3	4	5	6	7	8
Type Item (1)	Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)
0	8241	15.a	T-11P	86740	Man of ...		
0	8242	15.b	T-11P	86740	Man of ...		
0	8243	15.d	T-11P	86740	Man of ...		
0	8244	15.e	T-11P	86740	Man of ...		
0	8245	15.f	T-11P	86740	Man of ...		
0	8246	15.g	T-11P	86740	Man of ...		
0	8247	15.h	T-11P	86740	Man of ...		
0	8248	16.a	T-11P	25541	Man of ...		
0	8249	16.b	T-11P	25541	Man of ...		
0	8250	16.b	T-11P	25541	Man of ...		
0	8251	16.d	T-11P	25541	Man of ...		

Note - Max characters allowed for each entry shown in (1)

1	2	3	4	5	6	7	8
Type Item (1)	Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)
0	8-4	160	T-13	ZSS4	Comp. capability		
0	8-4	161	T-13	ZSS4	Control numbers		
0	8-4	162	T-13	ZSS4	Low range		
0	8-4	163	T-13	ZSS4	Operation of control panel		
0	8-4	164	T-13	ZSS4	High range		
0	8-4	165	T-13	ZSS4	Accident analyzer for control		
0	8-4	166	T-13	ZSS4	Filter for strip removal		
0	8-4	167	T-RP	ZSS44	Lab. in control		
0	8-4	168	T-RP	ZSS44	Max. of paper		
0	8-4	169	T-RP	ZSS44	W. in control		
0	8-4	170	T-13	ZSS4	Control panel		

ATTACHMENT B

OPEN ACTION ITEMS LIST

Date: 7/1/83

Docket # 811-2  
(8)

Type Code: A=Allegation  
 B=Bulletin  
 C=Circular  
 D=Deviation  
 E=50.55(e)  
 L=LER  
 M=Miscellaneous  
 O=Open Item  
 R=Part 21 Report  
 T=Temporary Instructions  
 U=Unresolved Item  
 V=Violation

Note - Max characters allowed for each entry shown in (1)

1	2	3	4	5	6	7	8
Type Item (1)	Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)
V	811-2	4	T-EP	82110	Information on employees B-ship	8211	C
V	811-2	62	T-EP	82110	Separation of... dis... radical... waste products	8211	O
V	811-2	62	T-EP	82110	Separation of... ... contacts of... ...	8211	C
V	811-2	16.3	T-EP	82110	Transfer of... ...	8211	C

1	2	3	4	5	6	7	8
Type Item No. (1)	Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)
	821-01	15.a	T-RP	86740	Management attention to transportation activities.		
	821-02	15.b	T-RP	86740	Transportation activities - training and retraining.		
	821-03	15.d	T-RP	86740	Transportation activities - procedures and QA controls.		
	821-04	15.e	T-RP	86718	Closure of shipment liners.		
	821-05	15.f	T-RP	86740	Procedures for transfer, packaging and transport of licensed material.		
	821-06	15.g	T-RP	86740	Reduce inventory volume for radioactive waste storage.		
	821-07	15.h	T-RP	86740	Audit of transportation activities.		
	821-08	16.a	T-RP	25544	Dose rate calculations in Control room.		
	821-09	16.b	T-RP	25544	Post-accident sampling and analyzing capability.		
	821-10	16.b	T-RP	25544	Grab sample analyze contract.		
	821-11	16.d	T-RP	25544	Noble gas effluent monitor scale over-keep.		

Item No. (8)	Report Paragraph (6)	Responsible Section (4)	Module (7)	Description (186)	Update/Closeout Report (30)	Status Code (1)
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8211-12	16.e	T-RP	25544	Sample probe calibration capability.		
8211-13	16.e	T-RP	25544	Entrained moisture in gas sampling lines.		
8211-14	16.f	T-RP	25544	Location of Unit 2 containment high range radiation monitors.		
8211-15	16.f	T-RP	25544	Operability of containment high range radiation monitors.		
8211-16	16.f	T-RP	25544	Containment high range radiation monitor response.		
8211-17	16.k	T-RP	25544	Accident analysis for control room habitability.		
8211-18	16.d	T-RP	25544	Filter - Cartridge Removal		
8211-19	16.d	T-RP	25544	Laboratory calibration containment High Radiation Monitors.		
8211-20	16.g	T-RP	25544	Management responsibility for NUREG-0737 filters.		
8211-21	16.b	T-RP	25544	PASS facility exhaust systems filters.		
8211-22	16.a	T-RP	25544	Radiation qualification		