U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.	50-528/86-23, 50-529/86-23, and 50-530/86-17
Docket Nos.	50-528, 50-529, and 50-530
License Nos.	NPF-41 and NPF-51
Construction Permit No.	CPPR-143
Licensee:	Arizona Nuclear Power Project P. O. Box 52034 Phoenix, Arizona 85072-2034
Facility Name:	Palo Verde Nuclear Generating Station - Units 1, 2, and 3
Inspection at:	Palo Verde Site, Wintersburg, Arizona
Inspection Conducted:	July 7-25, 1986

Inspector: _____ 8-6-86
R. C. Sorensen, Reactor Inspector — Date Signed

Approved by: _____ 8-6-86
L. F. Miller, Jr., Chief — Date Signed
Reactor Projects Section 2

Summary:

Inspection on July 7-25, 1986 (Report Nos. 50-528/86-23, 50-529/86-23, and 50-530/86-17)

Areas Inspected: Unannounced inspection by a regional based inspector of 10 CFR 50.55(e) construction deficiencies, licensee action in response to Part 21 reports, allegations, TMI Action Plan items, followup of licensee action on inspector identified items, and LERs. The inspection covered Units 1, 2, and 3, and NRC Inspection Procedures 30703, 92700, 36100, 25565, and 92701 were covered. The inspection of Units 1, 2, and 3 involved 87 inspector hours onsite and in office by one NRC inspector.

Results: Of the areas inspected, one violation was identified. (Failure to provide corrective action to preclude repetition of a significant condition adverse to quality, paragraph 2.d).

DETAILS

1. Persons Contacted

Arizona Nuclear Power Project (ANPP)

*E. E. Van Brunt, Jr., Executive Vice President
*J. Haynes, Vice-President, Nuclear Production
*L. Souza, Assistant Director, Corporate Quality Assurance (QA)/Quality Control (QC)
*T. Shriver, Compliance Manager
*R. Nelson, Maintenance Manager
*C. Russo, Quality Audits and Monitoring Manager
*G. Olson, Electrical Maintenance Superintendent
*J. Matteson, Quality Monitoring Supervisor
N. Lossing, Quality Investigations Supervisor
T. Bradish, Compliance Supervisor
*R. Baron, Compliance Supervisor

Bechtel Power Corporation (Bechtel)

**D. Hawkinson, Project QA Manager
H. Guire, QA Supervisor
*P. Huber, QA Engineer

The inspector also talked with numerous other licensee and contractor personnel during the course of the inspection.

*Attended exit meeting of July 17, 1986.

2. Licensee Action on 10 CFR 50.55(e) Construction Deficiencies in Unit 3

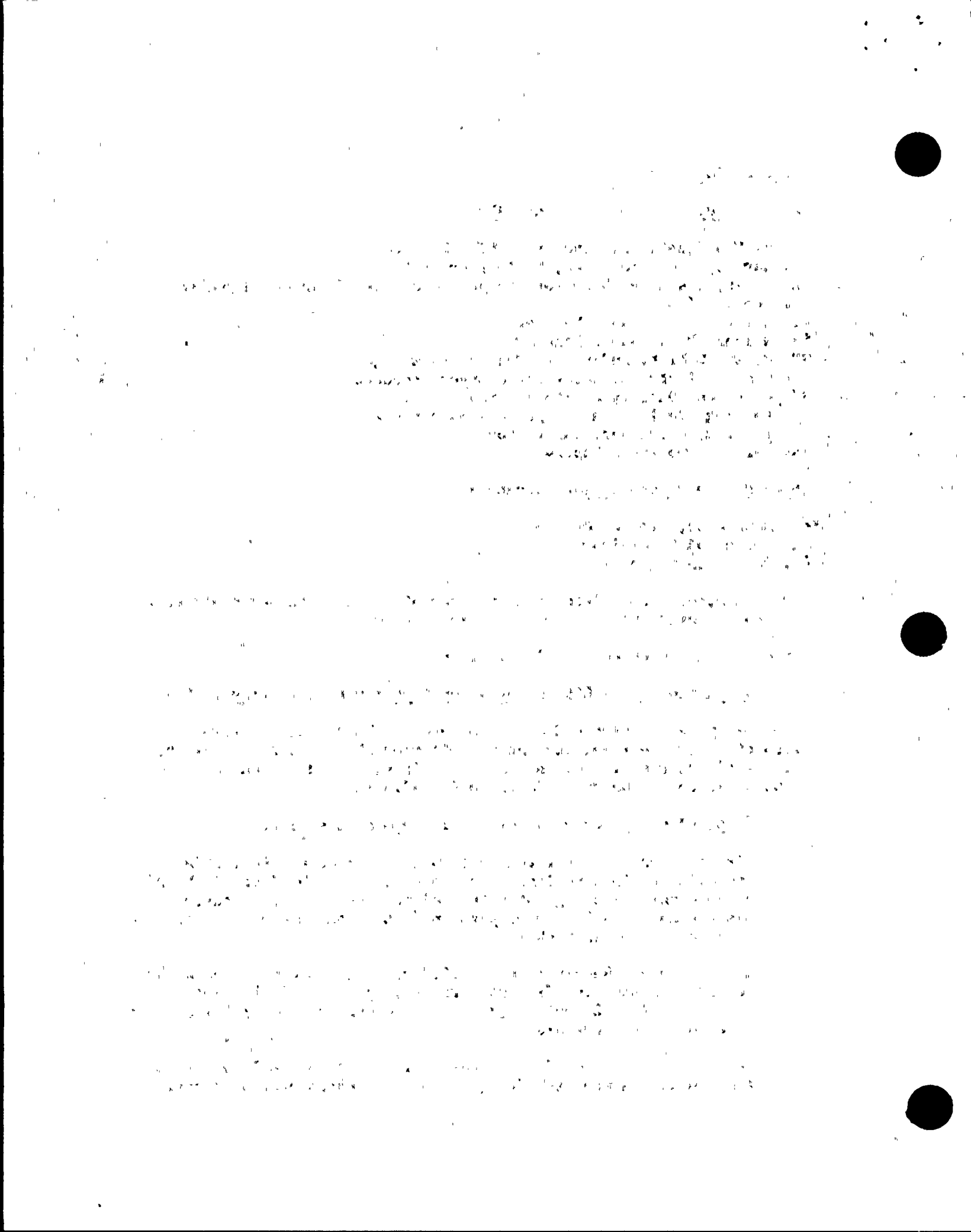
The following Deficiency Evaluation Reports (DERs) were reviewed by the inspector for reportability and to determine the thoroughness of the licensee's corrective action. All were judged by the licensee to be reportable under the criteria of 10 CFR 50.55(e).

a. (Closed) DER 85-04 - Deficient Fire Damper Installation

Fire dampers in fire rated walls were required by the manufacturer's installation instructions to be fastened on both sides of the sleeve at intervals of not greater than eight inches. The licensee discovered 36 such fire dampers in Unit 3 fastened on only one side at intervals of 12 inches.

Nonconformance Report (NCR) MJ-2569 was initiated which authorized rework to fasten the fire dampers on both sides of the sleeves with either (1) 1/4"-20 bolts, (2) No. 10 screws, or (3) 1/2" long welds at eight inch intervals.

The work was completed and properly inspected by Quality Control (QC) in accordance with WPP/QCI 2.4. All documentation appeared to



be satisfactory and in order. In addition, Bechtel QA verified corrective action for a sample of fire dampers by field inspection.

The inspector was satisfied with the licensee's actions concerning this DER and it is closed.

b. (Closed) DER 85-05 - Fire Penetrations Without Proper Taping on the on the Bus Conductor

The licensee discovered that the approved fire seal design for non-segregated phase (non-Class 1E) bus fire stops had not been properly implemented. A high voltage tape had not been applied to the bare bus bars prior to installing the silicone foam fire seals, as required by vendor instructions. This could impair the ability of the fire seal to limit fire to one particular area.

All 19 non-segregated buses in Unit 3 were inspected for this problem and corrected as applicable by removing the old fire seal, installing the proper tape and reinstalling the fire seal. The work was done per Contractor Work Order (CWO) and was QC inspected in every case.

The inspector examined two accessible fire seals for texture and for the existence of voids. Both were satisfactory.

Therefore, the licensee's actions concerning this DER were found to be acceptable and it is closed.

c. (Closed) DER 85-16 - Cracked Spokes on Fans of Air Handling Units (AHUs)

Cracked spokes were found on the fan wheel of AHU 3M-HJB-Z04 in Unit 3 which had never been placed in operation. This AHU provided conditioned air to the Train B ESF Switchgear Room and D.C. Equipment Room. Based on an engineering evaluation, it was determined that these cast iron fan wheel hubs were susceptible to stress cracking and that the hubs should be made of a tougher material. Poor quality castings were determined to be the root cause of the problem.

This problem also applied to one other AHU in Unit 3, 3M-HJA-Z04, supplied under Bechtel Purchase Order 10407-13-MM-721A.

The hub for 3M-HJA-Z04 was replaced by an on-site fabricated hub in accordance with Construction Inspection Plan (CIP) 156.0-1922.

The hub for 3M-HJB-Z04 was replaced by a new hub from the vendor which had been radiographed for detection of minute cracks. This work was done per CIP 156.0-1923. Applicable steps of both work documents were inspected both by Area Field Engineers (AFE) and QC Engineers.

The licensee's action concerning this DER appeared to be adequate and it is closed.

d. (Closed) DER 85-22 - Foreign Material Inside Auxiliary Relay Cabinets

The licensee identified instances of color-coded visual indicators on type ARD Westinghouse Industrial Control relays breaking off inside Class 1E Auxiliary Relay Cabinets. The broken indicators had fallen into the relays restricting their movement and had precluded proper operation of associated Class 1E control circuitry. Further investigation by the licensee identified such debris as wire markers, metal pieces, and wire insulation inside the relays. The root cause was determined to be the craftsmen's failure to properly follow specified work practices during rework. Startup Work Authorization (SWA) 2694 provided corrective action which inspected and cleaned the relays in the Auxiliary Relay Cabinets in Unit 3. All applicable relays were verified by the AFE and QC personnel.

However, the inspector found numerous examples of the same problem during a field inspection of a sample of Auxiliary Relay Cabinets in Unit 3. The same conditions were also found in Unit 2 with such materials as screws, washers, glass, wire insulation, metal shavings, tie wraps, broken color-coded indicators and other unidentified material found either on, or in, the relays, and to a lesser extent in Unit 1.

The inspector reviewed other corrective actions completed by the licensee for this deficiency including: (1) SWAs 18700, 18760, 18769, 18790, 18823, 17690, 18605, 18611, 18614, and 18615 which cleaned and inspected relays in Class 1E Auxiliary Relay Cabinets in Unit 2; (2) a quality talk that was held on July 2, 1985, and stressed protecting permanent plant equipment during the construction and testing phases; and (3) a revision to Specification 13-EM-306, dealing with electrical work, which added a similar type of precaution.

This indicates a failure to provide corrective action to preclude the repetition of a significant condition adverse to quality, which is a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." (Violation 50-528/86-23-01).

The inspector noted at the exit meeting that had the QA verification of the DER corrective action included a hardware inspection, this failure to provide sufficient corrective action may have been identified much earlier by the licensee.

The licensee provided immediate action in Units 2 and 3 to rectify the deficiency by issuing work orders and SWAs, as applicable, to inspect and clean the Auxiliary Relay Cabinets. A spot check by the inspector in Unit 2 showed this action to have been effective in removing the foreign material, however, work in Unit 1 was still ongoing at the time of the exit meeting and could not be verified by the inspector.

At the exit meeting, the inspector pointed out to licensee management several areas of concern regarding this problem which

warranted attention including: (1) root cause, (2) long-term corrective action, (3) transportability, and (4) impact on operability of safety systems or components.

Licensee management agreed to institute preventive maintenance to inspect the Auxiliary Relay Cabinets on a monthly basis, at first, until they are assured the problem has been corrected.

This DER is closed, but the licensee's actions in response to this violation will be followed during a subsequent inspection.

e. (Closed) DER 85-27 - Pacific Scientific Company Pipe Clamp Slippage

Pacific Scientific Company informed the licensee that 3/4" and 1" snubber pipe clamps supplied by them are subject to slippage circumferentially around the pipe. This was because Pacific Scientific Company had used a calculation for a larger pipe clamp for use with these smaller clamps. This resulted in an insufficient torque specification for this size pipe clamp.

Sixteen such pipe clamps were supplied to Palo Verde 3. The clamps that were installed at the time of the inspection were retorqued to a valve of 175-185 inch-pounds and checked after 15 minutes. This was accomplished per the resolution of NCR PC-11344. The QC inspection for the clamps was documented on the NCR and appeared to be adequate.

The inspector selected a random sample of 5 of these pipe clamps and checked them for tightness. No deficiencies were identified.

The inspector was satisfied with the licensee's actions concerning the DER and it is closed. This also closes Part 21 report 85-16-P regarding Pacific Scientific Company pipe clamps for Unit 3.

3. Licensee Action on Part 21 Reports

The inspector reviewed the licensee's action concerning 10 CFR 21 deficiencies reported by vendors.

a. (Closed) 84-02-P - Terry-Turbine Valves

Terry/Ingersoll-Rand informed the licensee that the trip and throttle (T&T) valves associated with the turbine driven AFW pump would not fully close under conditions of low steam flow and high inlet pressure. This was due to a valve stem imbalance when the pressure below the valve disc exceeded 700 psig. A stiffer spring was provided to the licensee which had sufficient compression to overcome this stem imbalance at high pressure/low flow conditions.

The inspector reviewed Design Change Package (DCP) 3CM-AF-060 which replaced the spring in the Unit 3 AFW pump T&T valve. The documentation appeared to be adequate and in order.

This item is closed for Unit 3.

b. (Closed) 85-15-P - TEC Model 914-1 Defective Analog Level Detectors

The licensee was informed by Technology for Energy Corporation (TEC) that certain analog level detectors supplied by them could be defective. These transmitters were used primarily in the valve position indication system for pressurizer safety valves, which was a TMI modification. The vendor provided a test procedure to the licensee to determine if the modules were defective. These tests were performed in accordance with W.O. 124026 in Unit 1 and W.O. 123921 in Unit 2. The inspector reviewed these tests and found that they were performed properly. No defective detectors were found associated with the pressurizer safety valves.

This item is closed.

4. Allegation RV-86-A-020

Characterization

Fire barrier foam in a large number of Unit 1 penetrations is bad. Construction Work Orders (CWOs) in Unit 1 are being field modified without review.

Implied Significance to Plant Design, Construction, or Operations

Bad foam could provide inadequate fire barriers. Modifying CWOs without proper engineering review could lead to inadequate fire barriers.

Assessment of Safety Significance

The inspector followed up on investigations made by the licensee's Quality Investigations (QI) organization concerning allegations received from Bisco craft persons. This was the only followup action remaining from inspection report 50-528/86-16 concerning this allegation.

Reports were compiled by QI documenting investigations performed, individuals interviewed, records reviewed, and conclusions reached. The inspector reviewed these reports, including supporting documentation that reinforced the licensee's conclusions.

The inspector found the licensee's actions to have been appropriate and thorough as evidenced by the reports and interviews with key personnel. None of the allegations received by the licensee, which included those received by the NRC, were substantiated.

Also, the inspector had questioned the adequacy of two particular fire seals (one in Unit 1 and one in Unit 2). These were addressed by both Bechtel Engineering and ANPP Engineering in Engineering Evaluation Request (EER) 86-ZA-015. Both organizations found these two fire seals to be proper and adequate as defined by procedures and specifications.

Staff Position

These concerns were not substantiated.

Action Required

None. This allegation is closed.

5. TMI Action Plan Items

a. (Closed) II.K.3.5 - Auto Trip of Reactor Coolant Pumps (RCPs)

This item had originally directed licensees to trip all RCPs in the event of a loss of coolant accident until further guidance was provided.

CEN-152, Revision 02, Emergency Procedure Guidelines, approved by the Office of Nuclear Reactor Regulation, subsequently provided guidance to trip two RCPs and leave two RCPs running in the event of a Safety Injection Actuation Signal.

The inspector reviewed the licensee's emergency procedures for Unit 1 to ensure that the new trip two/leave two RCP scheme for a SIAS had been incorporated. This was verified to be the case.

The inspector was satisfied that the licensee had met the intent of this item for Unit 1. This TMI item is closed.

b. (Open) III.D.1.1 - Primary Coolant Outside Containment

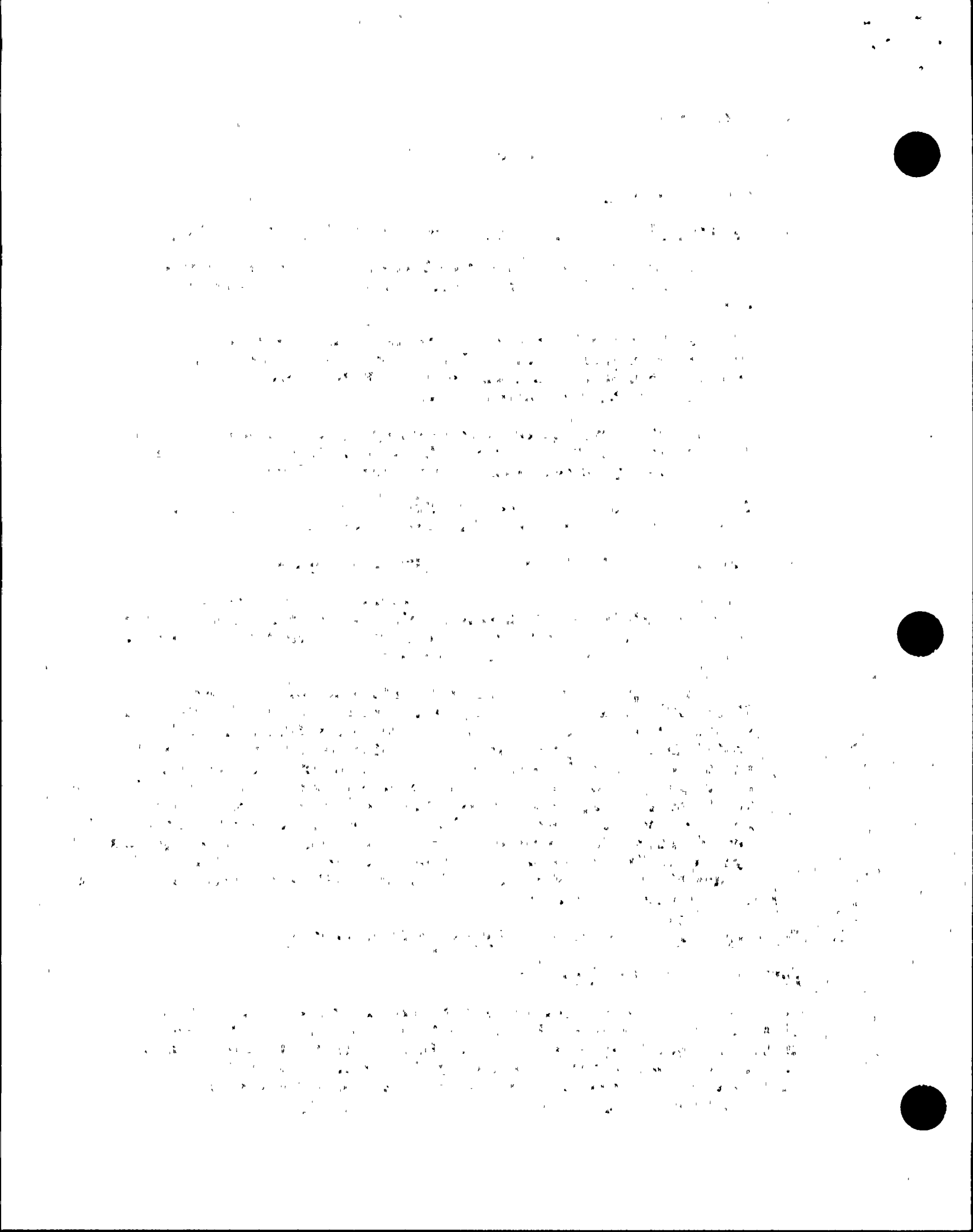
This item required the licensee to provide a summary description, together with initial leak test results, of their program to reduce leakage from systems outside containment that could contain highly radioactive fluids following an accident.

The inspector reviewed the initial performance of procedure 73ST-9SI04 which was the leakage monitoring procedure for the high pressure safety injection, low pressure safety injection, and containment spray systems in Unit 1. Also reviewed were the initial performances of 74ST-1SS02 and 74ST-2SS02, which were the leakage monitoring procedures for the post accident sampling system (PASS) for Units 1 and 2, respectively. These procedures were found to have been performed properly. However, the inspector still must review the completed procedure for leak testing the safety injection systems in Unit 2, and review actions the license has taken to reduce the identified leakage. This item will remain open until these reviews are complete.

6. Followup of Licensee Action on Inspector Identified Items

Unresolved Item 50-528/85-40-01

The licensee had missed several ASME Section XI valve surveillances. This was due primarily to the fact that large numbers of valves were tested on a quarterly basis by about six surveillance test procedures. One procedure had tested approximately 250 valves. This led to difficulties in scheduling surveillance tests for these valves and tracking them to completion.



Licensee management had indicated that the six procedures would be broken down into many smaller ones. Each of these smaller procedures would be performed in entirety and the valves tracked accordingly. This would greatly simplify scheduling and tracking of the quarterly surveillance tests for ASME Section XI valves.

The inspector verified that there now existed 18 different procedures for each Unit that accomplished the same purpose as six procedures previously did for both Units 1 and 2. Each procedure was to be performed in its entirety and would easily be scheduled and tracked by the Surveillance Procedure Control Group.

The inspector was satisfied with the licensee's resolution of this item and it is closed.

7. Licensee Event Report

The following LERs were reviewed and closed. The inspector verified that reporting requirements had been met, root causes had been identified, corrective actions appeared to be appropriate, and violations of Technical Specifications had been identified.

Unit 1

86-29 - Unsealed AFW Pump Room Penetrations

86-32 - Procedural Deficiency Results in CREFAS Actuation

Unit 2

85-05 Supplement 1 - Control Room Ventilation Recirculation Discontinued Due to Operator Error

86-08 - MSIS Actuation Due to Personnel Error

86-09 - MSIS Actuation Due to an Incorrect Amperage Fuse

86-12 - Inoperable Class IE Batteries Due to Inadequate Surveillance Testing

86-13 - Inadequate Review of Surveillance Testing Credit Resulted in Equipment Not Being Tested

8. Exit Meeting

The inspector met with the licensee representatives denoted in paragraph 1 on July 17, 1986. The scope of the inspection and the inspector's findings as noted in this report were discussed.