UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W.
ATLANTA, GEORGIA 30323

Report No.: 50-261/89-01

Licensee: Carolina Power and Light Company
P. O. Box 1551
Raleigh, NC 27602

Docket No.: 50-261 License No.: DPR-23

Facility Name: H. B. Robinson

Inspection Conducted: January 9-13, 1989

Inspectors: Stephen Tingen — 2/21/89 Date Signed

John Zeiler — 2/16/89 Date Signed

Approved by: George A. Belisle, Chief — 2/23/89 Date Signed
Test Programs Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope

This routine, announced inspection was conducted in the areas of complex surveillance, inservice testing, verification of containment integrity, local leak rate testing, licensee action on NRC Bulletins 85-03 and 86-03, and licensee action on previous inspection findings.

Results

A strength was identified in the Licensee Bulletin 85-03 program that involved a well documented and thorough design review that identified nine marginally or undersized valve actuators, Paragraph 2.a. In Paragraph 2.c, a weakness was identified in the licensee internal response to Information Notice 86-05. In Paragraph 3.b(2), a weakness in the inservice test program was identified that involved review of stroke time results.

In Paragraph 3.b. (2), a violation was identified for failure to take corrective action following detecting increased stroke times for cold shutdown valves.

In paragraphs 2.c and 3.b.(2), the licensee made commitments in the areas of main steam safety valve ring settings and cold shutdown valve stroke times that would be accomplished prior to restart from the present refueling outages.

In the area of containment integrity, inspection findings indicated that the licensee has developed and implemented a program of controls, procedures, and test activities to ensure and maintain containment integrity. Containment related and post-LOCA mitigating systems and components reviewed were found to be in a high state of availability.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Curley, Director, Regulatory Compliance
*R. Dayton, Project Engineer, Systems
*C. Dietz, Manager, Robinson Nuclear Project Department
S. Edwards, Senior Engineer, Technical Support
W. Farmer, Senior Engineer, Technical Support
*S. Griggs, Aide, Regulatory Compliance
*E. Harris, Jr., Director, Onsite Nuclear Safety
W. McCutcheon, ISI Technician
*R. Morgan, General Manager
*M. Page, Acting Manager, Technical Support
*R. Powell, Engineering Supervisor, Technical Support
*S. Pruitt, Senior Specialist, ISI Coordinator
*D. Quick, Manager, Maintenance
*D. Sayre, Regulatory Compliance
*G. Shartzer, Senior Engineer, Technical Support
*J. Sheppard, Senior Engineer, Technical Support
*E. Shoemaker, Senior Engineer, Operations

Other licensee employees contacted during this inspection included engineers, operators, technicians, and administrative personnel.

NRC Resident Inspector

*L. Garner, Senior Resident Inspector

*Attended exit interview

2. IE Bulletin and Information Notice Followup (25573) (92701) (97703)

a. IE Bulletin 85-03 Followup

(Closed) 85-BU-03, T2515/73, "Motor Operated Valve Common Mode Failure During Plant Transients Due to Improper Switch Settings." The purpose of this Bulletin is to require licensees to develop and implement a program to ensure that switch settings for high pressure coolant injection and emergency feedwater system motor operated valves (MOVs) subject to testing for operational readiness in accordance with 10 CFR 50.55a(g) are properly set, selected, and maintained.

In order to evaluate the licensee's Bulletin 85-03 program, the inspector held discussions with the appropriate licensee personnel and reviewed the following:

Carolina Power & Light Company's (CP&L) letter, dated January 22, 1988, Serial No. NLS-88-011.

Engineering Evaluation No. 87191, Justification for Continued Operation for Steam Driven Auxiliary Feedwater Pump Valves MS-V1-8A, B and C and MS-V2-14A, B and C.

Engineering Evaluation No. 87188, Evaluation of Switch Settings for Valves SI 870A and SI 870B Limitorque Motor Actuators.

Engineering Evaluation No. 87190, Evaluation of Switch Settings for Valves V2-16A, B, and C Actuators.

Engineering Evaluation No. 87202, Standardization of Limit Switch Settings on Valves Listed in Response to IE Bulletin 85-03.

(1) Bulletin 85-03 Action Item a required that the design basis for the operation of each bulletin valve be reviewed and documented. This item has been completed by the licensee. Operation at 80 percent degraded voltage was a criterion for the design review basis. The documentation of the design review performed by the licensee is extensive and thorough, and identified that 9 of the 11 bulletin valves had undersized or marginally sized actuators. The nine valves with actuators scheduled to be replaced with larger actuators are AFW-V2-16A, B, and C, Motor Driven Auxiliary Feedwater Pump Discharge Isolation Valves, AFW-V2-14A, B, and C, Steam Driven Auxiliary Feed Pump Discharge Isolation Valves, and MS-V1-8A, B, and C, Steam Driven Auxiliary Feedwater Pump Inlet Valves. These nine actuators will be replaced during the 1990 refueling outage. The licensee has prepared justifications for continued operation for these valves until the actuators are replaced. The inspector reviewed the justifications for continued operation and considers them acceptable.

(2) Bulletin 85-03 Action Item b required that correct switch settings be reviewed and revised as necessary. This item has been completed by the licensee with the exception of sizing and selecting actuator motor thermal overloads. The present thermal overloads trip in 30 seconds. The licensee is evaluating the use of ten second trip overloads. The ten second trip thermal overloads will provide more protection to the actuator motor but could result in spurious trips which have not been experienced with the 30 second thermal overloads. This is currently under investigation.

(3) Bulletin 85-03 Action Item c required that switch settings be changed as appropriate, based on the design review performed, and each valve be demonstrated operable by testing the valve at the maximum differential pressure it will see during the worst

case design accident pressure. The licensee utilized motor actuator characteristic (MAC) diagnostic test equipment to obtain the as-found and to verify the as-left switch settings.

During the as-found diagnostic testing, one deficiency encountered was spring-pack gap. To perform diagnostic testing with MAC equipment, the spring-pack cartridge cover is removed and the MAC transducers are installed snugly against the spring-pack, which eliminates spring-pack gap while testing. After completion of MAC testing the spring-pack cartridge cover is reinstalled. If the cartridge cover is the non-adjustable type and a spring-pack gap does exist, then, the torque switch setting previously obtained from MAC testing has been altered. To correct this situation the licensee has replaced the nonadjustable spring-pack cartridge covers with adjustable cartridge covers. The adjustable cartridge cover can be adjusted to fit snugly against the spring pack to eliminate spring-pack gap.

During review of the licensee's bulletin program the inspector noted that the differential pressure at which several valves were tested was much less than the maximum design accident differential pressures. As previously discussed, the actuators tested at lower pressures are scheduled to be replaced with larger actuators. After replacement, the actuators and valves are scheduled to be tested at maximum design accident differential pressure. The inspector discussed the need to perform the differential pressure test at maximum design differential pressure and acceptable alternatives for not doing so. This area will be followed up during a future inspection.

(4) Bulletin 85-03 Action Item d required procedures to be prepared or revised to ensure that switch settings are maintained throughout plant life and to include provisions to monitor valve performance. Licensee procedures recognize bulletin valve revised switch settings, periodically require closed torque switch settings to be verified, and require valves to be cycled to verify operability. The licensee is in the process of expanding this program to establish post maintenance test requirements and monitor valve performance. Present licensee post maintenance test requirements are to stroke time test the valve following maintenance in accordance with ASME Section XI code requirements. Stroke timing alone is not an adequate test following some types of maintenance; and additional testing in the form of motor current measurement or actuator torque output measurement should be performed. Post maintenance testing and provisions to monitor valve performance along with differential pressure testing of replacement actuators is identified as Inspector Followup Item 261/89-01-01.

(5) As requested by Action Item e of Bulletin 85-03, the licensee identified the selected safety-related valves, the valves' maximum differential pressures and the program to assure valve operability in their letter dated July 30, 1986.

Review of this response indicated the need for additional information which was requested in a NRC, Region II letter dated August 18, 1987.

Review of the licensee's September 17, 1987, response to this request for additional information indicates that the licensee selection of the applicable safey-related valves to be addressed and the valves' maximum differential pressures meets the requirements of the bulletin and that the program to assure valve operability requested by Action Item e of the bulletin is now acceptable.

(6) Bulletin 85-03 Action Item f requires that a written report be issued to the NRC on completion of the bulletin program. The licensee issued this report on January 22, 1988.

b. IE Bulletin 86-03 Followup

(Closed) 86-BU-03, "Potential Failure of Multiple ECCS Pumps Due to Single Failure of Air-operated Valve in Minimum Flow Recirculation Line." The purpose of this bulletin was to require licensees to determine if a single valve failure due to loss of air or power in the safety injection (SI) pumps recirculation line would result in dead heading and subsequent failure of the SI pumps. The licensee determined that this did apply to Robinson Nuclear Plant and completed the corrective action during the present refueling outage.

Valves SI-856A and B are in series in the SI pump's common recirculation line to the Refueling Water Storage Tank (RWST). The valves would fail-closed on loss of air or power which would result in dead heading all SI pumps. Modification M-943 was recently completed. It changed valves SI-856A and B from fail-closed to fail-open on loss of air or power to the valves and added a hand wheel operator for manual operation. When switching SI pump suction from the RWST to the containment sump, the valves will be required to be manually shut.

c. IE Information Notice 86-05 and Supplement 1 Followup

This Information Notice alerts licensees that Main Steam Safety Valves (MSSVs) on pressurized water reactors may have never been adequately tested to verify that the valves could pass full rated steam flow. Several examples were cited where utilities had to adjust the MSSV ring settings from vendor original specifications to new settings based on full flow testing performed on the licensee's MSSVs.

Robinson MSSVs are the same type of valves discussed in Information Notice 86-05. The valves are Crosby safety relief valves with adjusting rings which determine the flow capacity and blowdown of the valves. The licensee's response to Information Notice 86-05 was to follow the Westinghouse Owners Group (WOG) which is testing MSSVs in order to establish MSSV ring settings where subsequent flowrates and blowdowns were known. Upon completion of the WOG MSSV testing, the licensee was going to attempt to obtain the test results, and set their MSSVs' rings based on WOG testing. The licensee was also considering removing the MSSVs and performing full flow testing. The licensee did not perform a safety analysis to determine if their MSSVs, with present ring settings, provided flow to protect the reactor plant during an accident. Prior to restart following the present refueling outage the licensee has committed to either adjust MSSV ring settings to new settings specified by Crosby where adequate flow testing has been performed to assure adequate flow and evaluate the subsequent blowdown or perform a safety analysis to determine if the reactor plant is protected with the present MSSV flow.

Information Notice 86-05 also discussed a utility where MSSV ring settings were incorrectly set following maintenance due to procedure inadequacy. During the 1987 refueling outage Robinson discovered that three of the 12 MSSVs had the following incorrect ring settings:

Valve No.	As-found Ring Settings	As-left Ring Setting
SV-3A	Nozzle Ring (-20) Guide Ring (+125)	Nozzle ring (-20) Guide Ring (+75)
SV-2B	Nozzle Ring (-15) Guide Ring (+75)	Nozzle Ring (-20) Guide Ring (+75)
SV-3B	Nozzle Ring (-15) Guide Ring (+75)	Nozzle Ring (-20) Guide Ring (+75)

In a CP&L inter-office correspondence letter dated September 1987, the license recognized that the procedure that addresses MSSV ring settings, CM-106, required revision to ensure the as-found and as-left ring settings were properly documented but revisions to CM-106 have not been made. Procedure CM-106 provides instructions to rebuild MSSVs, but has not been performed since the 1987 refueling outage. Prior to the next MSSV refurbishments, the licensee intends to change CM-106 to document proper ring settings. In this same inter-office letter the licensee determined the three valves with incorrect ring settings did not adversely affect relief capability. Changing procedure CM-106 to properly document ring settings and licensee action to adjust ring setting to obtain full rated flow is identified as Inspector Follow-up Item 261/89-01-02, Revise Procedure CM-106 to Provide for Adjustment of and Documentation of Ring Settings.

Within this area, no deviations or violations were identified.

3. Complex Surveillance and Inservice Testing (61701) (73756)

a. The inspector reviewed the MSSV and Pressurizer Safety Valve (PSV) setpoint test surveillance program accomplished during the 1987 refueling outage. Procedure No. EST-028, Revision 2, Main Steam Safety Valve Testing, and EST-027, Revision 7, Pressurizer Safety Valve Testing, were reviewed by the inspector. The setpoint tolerance and test frequency for the PSVs are specified in Robinson Technical Specifications (TS). The MSSV setpoints and test frequency are also specified in the TS; however, MSSV setpoint tolerance is specified in Section III of the ASME code. MSSV and PSV test methods are specified in ASME Section XI, 1977 Edition, which invokes ANSI/ASME-PTC 25.3-1976, Safety Relief Valves Performance Test Codes. These requirements are included in Procedures EST-027 and EST-028.

(1) MSSV Testing

As specified by TS, the licensee tests all 12 MSSVs during each refueling outage. Robinson personnel setpoint tests MSSVs in place with the main steam line at normal operating pressure and temperature utilizing the Crosby pressure assist device. During the 1987 refueling outage, all MSSVs were setpoint tested and all as-left set points were within specified tolerances.

(2) PSV Set Point Testing

Robinson PSVs are installed on three insulated loop seals attached to the top of the pressurizer. TS specify a setpoint of 2485 psig with a plus 3 percent tolerance. Robinson has three spare PSVs. Each refueling outage the PSVs are removed from the pressurizer and the spares are installed. The removed PSVs are then setpoint tested with water at ambient temperature on a test bench. The results of the setpoint testing of the PSVs removed during the 1987 refueling are as follows:

Valve No.	As-found Set Point PSIG	Percent Deviation from Set-Point	As-left Set Point PSIG
RV-551A	2540	+2.2	2540
RV-551B	2600	+4.6	2520
RV-551C	2560	+3.0	2560

During the testing RV-551C seat leakage was found to be excessive. The seats were repaired and the valve retested. Retest results were acceptable. PSV seat leakage does not appear to be a significant problem at Robinson.

Within this area, no deviations or violations were identified.

b. Power Operated Valves Inservice Stroke Time Testing

Valve stroke time results obtained from Procedures OST-701, Inservice Inspection Valve Test, and OST-703, ISI Primary Side Valve Tests, dating back to 1986 were used as a basis for this review. The requirements to stroke time valves are contained in TS, which invoke Section XI of the ASME code. The licensee is committed to the 1977 edition of Section XI. The sections of Section XI inspected were paragraphs IWV 3412 and 3413.

(1) Paragraph 3413(a) of Section XI requires that the limiting value of full stroke time of each power operated valve shall be specified by the owner. The limiting value of full stroke time for numerous primary containment isolation valves contained in OST-701 is 15 seconds; however, the actual measured stroke times average from one to seven seconds.

(2) Paragraph IWV-3413(c) of Section XI states that if a stroke time increase of 50 percent or more from the previous test for valves with stroke times less than or equal to ten seconds is observed, test frequency shall be increased to once each month until corrective action is taken, at which time the original test frequency shall be resumed. Paragraph IWV-3413(c) also requires that any abnormality or erratic action be reported. During a review of valve stroke times, the inspector noted numerous instances where valves with stroke times less than ten seconds had a 50 percent or more increase in stroke time from the previous test. In the cases where stroke times increased 50 percent or more from the previous test, the valves would be placed in a monthly surveillance status until stroke times decreased to normal or a new base line developed. In the cases of abnormal stroke time decreases from the previous test, no action was taken. The action required to be taken following increases and decreases in stroke times is judgmental; however, the person making the judgement for subsequent actions has to be knowledgeable of the valve and the system the valve is in, in order to be able to determine if valve degradation or malfunction is occurring. At present, the licensee's inservice test program does not have an individual knowledgeable of the particular valve and system to provide input into stroke time evaluations. An inservice test individual is reviewing all results; however, his primary function is in the area of tracking results and ensuring that surveillance frequencies are performed. This item was discussed with the licensee who indicated that corrective action involving system engineers' review of stroke times would be initiated. Review of stroke time results by system engineers will be verified by the Nuclear Regulatory

Commission during a subsequent inspection and is identified as Inspector Followup Item 261/89-01-03.

Paragraph IWV-3412(a) of Section XI states that valves that cannot be exercised during plant operation shall be specifically identified by the owner and shall be full-stroke exercised and stroke time tested during cold shutdowns. The inspector reviewed the stroke time results of the primary containment valve contained in OST-703, PCV-1716. The stroke times of valve PCV-1716 are as follows:

Date PCV-1716 Tested	Stroke Time (Seconds)
01/27/85	9.5
03/13/86	10.0
05/06/87	6.0
05/25/87	2.0
02/14/88	2.5
09/06/88	4.8

The stroke time on September 6, 1988 was a 92 percent increase from the previous test on February 14, 1988. No corrective action nor evaluation was performed for the PCV-1716 September 6, 1988, increased stroke time prior to resuming critical operations on September 19, 1988. The plant remained operating until November 12, 1988, when it was shutdown for the present refueling outage. Valve PCV-1716 was not placed in monthly surveillance during the September 19, 1988, to November 12, 1988, period. As previously discussed, paragraph IWV-3413(c) requires valves to be placed in monthly surveillance until corrective action is taken when stroke times increase by more than 50 percent. Following the September 6, 1988, 92 percent increase in stroke time for valve PCV-1716 corrective action was not taken nor was the valve placed on a monthly surveillance schedule. Failure to comply with the requirements of Paragraph IWV-3413(c), Section XI, is identified as Violation 261/89-01-04.

Several significant stroke time decreases occurred for valve PCV-1716. Present licensee practice is to record decrease in stroke times but not evaluate why the decrease occurred. A stroke time decrease could be an indication of a valve failure such as a disk separated from a valve stem for example, and therefore, needs to be evaluated.

PCV-1716 was the only cold shutdown valve that the inspector reviewed for stroke time performance. As a result of this finding, the licensee reviewed stroke times dating back to 1986 for all remaining cold shutdown valves and identified

approximately 12 additional valves where stroke times exceeded the 25 or 50 percent Section XI, stroke time limits and corrective action was not taken nor was frequency increased to once each month. The licensee committed to initiate corrective action and to complete corrective action for the cold shutdown valves that were identified to have the increased stroke times prior to startup from the present refueling outage.

(3) The inspector reviewed copies of OST-701 that had been completed back to 1986. The majority of the valves in OST-701 are primary containment air operated valves with ASCO solenoid valves directing the air to the valve. The inspector also discussed cycling of these valves with a senior shift supervisor. The review of OST-701 stroke time results indicate that only one failure for a valve to operate had occurred since 1986. This failure was attributed to a valve lineup problem in the air supply to the valve. Since operations personnel normally stroke test valves, the inspector questioned the senior shift supervisor if failures were occurring that were not documented, if valves were being exercised prior to stroke timing, or if tapping on ASCO solenoids ever occurred. The senior shift supervisor's reply was that these practices do not occur and, as the OST-701 tests results indicate, the valves work well. During this inspection, the inspector did not observe any ASCO solenoid problems like those that have occurred at other sites.

4. Verification of Containment Integrity (61715)

The licensee's program designed to ensure and maintain containment integrity was assessed by reviewing: (1) procedures and controls which ensure that containment integrity is established, monitored, and maintained, and (2) procedures and controls designed to mitigate contamination releases in the event of loss of containment integrity following a loss-of-coolant accident (LOCA). Procedures were reviewed for technical content adequacy, the proper extent of administrative control of activities, and record keeping. Surveillance test records of tests performed in accordance with plant TSs on containment related and post-LOCA mitigating systems were reviewed to ascertain system and component availability status. System and component availability was evaluated to ensure that containment integrity would be maintained in the event of severe accidents. The post-LOCA mitigating systems or components reviewed included the following:

- Containment isolation valve alignment, operability, and stroke time
- Containment spray and iodine removal system
- Containment fan coolers

- Post accident containment venting system

- Containment internal pressure limits

The operational readiness of post-LOCA mitigating systems was evaluated based on the adequacy of the procedures, controls, and surveillance tests conducted.

a. Documents Reviewed

- Operating Procedure (OP)-923, Revision 8, "Containment Integrity"

- Operations Management Manual (OMM)-008, Revision 42, "Minimum Equipment List"

- OP-921, Revision 10, "Containment Air Handling"

- Operations Surveillance Test (OST)-701, Revision 7, "Inservice Inspection Valve Test", (Frequency: When Required)

- OST-351, Revision 7," Containment Spray System", (Frequency: Refueling)

- Engineering Surveillance Test (EST)-006, Revision 2, "Containment Spray Nozzles", (Frequency: Five Years)

- OST-902, Revision 8, "Containment Fan Coolers", (Frequency: Monthly)

- OST-302, Revision 24, "Service Water System Component Test", (Frequency: Quarterly)

- OST-158, Revision 7, "Safety Injection and Containment Spray Flowpath Verification", (Frequency: Monthly)

b. Scope of Document and Record Review

The inspector reviewed the above surveillance procedures and related documents either totally or in part to verify that applicable plant TS requirements were met, that adequate information and instruction were provided, and that adequate acceptance criteria and limits were specified. The following table describes the TS required surveillance test records reviewed and gives the applicable TS which requires the surveillance test.

Containment System	Procedure No.	Records Reviewed	T.S.
Isolation valve operability	OST-701	01/15/88 - 10/17/88	4.4.1.2.a

Containment Spray System	OST-351	04/01/87 - 11/14/88	4.5.1.3
	EST-006	03/01/86	4.5.1.4
	OST-158	03/20/88 - 10/24/88	4.5.2.2
Containment Fan Coolers	OST-302	03/25/88 - 08/26/88	4.5.1.6
	OST-902	04/06/88 - 11/03/88	4.5.1.6
Containment Internal Pressure Limits	OMM-008	12/88	3.6.2

c. Procedure and Record Findings Summary

The procedures reviewed were technically accurate and in conformance with plant TS. Unacceptable conditions were not observed.

The surveillance test records review did not identify any discrepancies. The inspectors verified that the surveillance tests were performed at the required frequencies; that test results met acceptance criteria or limits; and that appropriate sign-offs, test reviews, and test concurrences were performed. These findings indicated that TS required plant systems and components designed to ensure containment integrity or mitigate post-LOCA contamination releases are operable.

Within this area, no violations or deviations were identified.

5. Local Leak Rate Testing (61720)

a. Inspection Scope

As part of the evaluation of containment integrity, the inspectors reviewed procedures and controls established by the licensee to verify local leak tightness of leakage barriers.

b. Documents Reviewed

- Technical Support Management Manual (TMM)-005, Revision 6, "10 CFR 50, Appendix J Testing Program"
- EST-004, Revision 8, "Isolation Seal Water System"
- EST-009, Revision 3, "Leak Rate Test of Containment Manometer Line"
- EST-010, Revision 2, "Containment Personnel Airlock Leakage Test"
- EST-059, Revision 3, "Local Leak Rate Test of Nitrogen Supply to Accumulators Isolation Valves"

- EST-060, Revision 3, "Local Leak Rate Test of N_2 Supply to Pressurizer Relief Tank Isolation Valves"

- EST-061, Revision 3, "Local Leak Rate Test of N_2 Supply to R. C. Drain Tank Isolation Valves"

- EST-062, Revision 1, "Local Leak Rate Test of Containment Instrument Air Header Isolation Valves"

- EST-063, Revision 5, "Leak Rate Test of Containment Firewater Supply Isolation"

- EST-064, Revision 0, "Containment Isolation Valve Local Leakage Rate Survey"

The inspectors reviewed the documents listed above to determine compliance with the regulatory requirements of Appendix J to 10 CFR 50, Technical Specifications, applicable industry standards, and with station administrative guidelines. The inspectors also held discussions with the licensee regarding test results documentation, the repair and retesting following failed tests, and the relationship of these items to the as-found and as-left containment conditions as applied to the integrated leak rate test results. The inspectors also reviewed the completed as-found and as-left Type C local leak rate test results for the past two years and the corrective maintenance work performed on leaky valves in this time period.

c. Findings

In general, the leak rate test procedures were technically accurate and in conformance with regulatory requirements. However, the inspectors noted that ten containment isolation valves were being leak rate tested by pressurizing in the non-accident direction. 10 CFR 50, Appendix J, Section III.c.1 states that type C tests shall be performed in the same direction as that when the valve would be required to perform its safety function, unless it can be determined that the results from the tests for a pressure applied in a different direction will provide equivalent or more conservative results. The following table lists information concerning the isolation valves in question.

Containment Penetration	Valve Ident.	Valve Size and Type
2-N_2 Supply to P. R. Tank	RC-550	0.75" Diaphragm
4-R.C. Drain Tank Vent	WD-1793	1" Diaphragm
35-Cont. Air Sample In	RMS-3	1" Diaphragm
36-Cont. Air Sample Out	RMS-1	1" Diaphragm
37-Cont. Purge Supply	V12-7	42" Butterfly
38-Cont. Purge Exhaust	V12-9	42" Butterfly

39-Cont. Service Air Header	SA-44	2" Diaphragm
40-Post Accident H_2 Vent Line	V12-18	3" Diaphragm
41-Cont. Press. Relief Line	V12-11	6" Butterfly
42-Cont. Vac. Relief Line	V12-13	6" Butterfly

The inspectors discussed this matter with the licensee and reviewed valve drawings to determine if reverse testing of the valves could be considered equivalent or conservative. Diaphragm valve drawings indicated that their symmetrical design, with no specific inlet or outlet side, provide bidirectional flow shutoff capability. Therefore, for these valve types, leak testing should provide equivalent results from a pressure applied in either direction. Purge valve drawings indicated a preferred valve installation which is dependent on LOCA flow direction. Based on the valve seat arrangement depicted in the drawings, it appeared that direction dependent leakage characteristics could exist for these valves. At the exit meeting the licensee agreed to further review all the valve designs and discuss with the valve manufacturers to determine if reverse valve testing is considered equivalent or conservative.

By memorandum dated January 20, 1989, the licensee reported that after further review and discussions with each valve vendor, the valves in question were determined to have directionally independent leakage characteristics at LOCA pressures. According to the purge valve manufacturer, the valve seal rings are designed to be resilient enough for any pressure-induced deflections occuring under design conditions. Pressures sufficient to cause the valve disc to be pushed away from the seal ring enough to unseat the valve would be far in excess of LOCA pressures. For the remaining butterfly valves, the vendors informed the licensee that the valves are designed to provide equivalent leakage characteristics in both directions as long as the pressure rating for the valves is not exceeded. The valve's technical manual states that these 150 psi rated valves may be installed with flow in either direction. According to the vendor, directional dependent leakage characteristics would not occur unless pressures greater than design pressures were introduced. The licensee also reported that the diaphragm valve vendor confirmed that there is no specified flow direction, no inlet or outlet side, and no different leakage characteristics from pressures applied to one side or the other. The inspectors were satisfied with these conclusions and had no further concerns in this area.

Within this area, no violations or deviations were identified.

6. Exit Interview

The inspection scope and results were summarized on January 13, 1989, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed

below. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

IFI 50-261/89-01-01, Bulletin 85-03 post maintenance testing, provisions to monitor valve performance, and differential pressure testing of replacement actuators, paragraph 2.a(4).

IFI 50-261/89-01-02, Changing procedure CM-106 to properly document ring settings and licensee action to adjust ring settings to obtain full flow, paragraph 2.c.

IFI 50-261/89-01-03, Engineering review of valve stroke time results, paragraph 3.b(2).

Violation 261/89-01-04, Failure to increase to monthly surveillances or take corrective action following increases in stroke times for cold shutdown valves, paragraph 3.b(2).

In paragraphs 2.c and 3.b(2), the licensee made commitments in the areas of main steam safety valve ring settings and cold shutdown valve stroke times that would be accomplished prior to restart from the present refueling outage.