

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-335, 50-389
License Nos: DPR-67, NPF-16

Report Nos: 50-335/98-12, 50-389/98-12

Licensee: Florida Power & Light Co.

Facility: St. Lucie Nuclear Plant, Units 1 & 2

Location: 6351 South Ocean Drive
Jensen Beach, FL 34957

Dates: December 13, 1998 - January 23, 1999

Inspectors: T. Ross, Senior Resident Inspector
D. Lanyi, Resident Inspector
G. Warnick, Resident Inspector
L. Hayes, Regional Inspector (Sections S1.2, S2.2, S2.3, and S5.1)
E. Girard, Regional Inspector (Sections M1.2, E8.3, and E8.4)
T. Scarbrough, Nuclear Reactor Regulation (NRR) (Sections M1.2, E8.3, and E8.4)

Approved by: L. Wert, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure

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PDR ADUCK 05000335
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EXECUTIVE SUMMARY

St. Lucie Nuclear Plant, Units 1 & 2 NRC Inspection Report 50-335/98-12, 50-389/98-12

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection; in addition, it includes the results of inspections by a regional security specialist, and regional and Nuclear Reactor Regulation (NRR) Motor Operated Valve (MOV) inspectors.

Operations

- The hydrogen analyzers and recombiners were in an operable condition as identified through the review of documents, inspection of accessible system components, and interviews with responsible individuals. The material condition and housekeeping of these systems were also acceptable. (Section O2.3)
- Equipment Clearance Orders were properly prepared, authorized, and implemented. (Section O2.4)
- Although the Non-licensed Operators performed their duties in a manner consistent with the Conduct of Operations procedure, they were not meeting the expectations of Operations Management regarding identification of minor equipment deficiencies. (Section O4.1)
- The licensee identified that TS limits for bypassing Containment Isolation Signal bistables had been exceeded. A Non-Cited Violation was identified. The Licensee Event Report met the requirements of 10 CFR 50.73 and correctly characterized the event. All corrective actions were completed satisfactorily. (Section O8.1)

Maintenance

- Maintenance and surveillance activities were performed well, with good documentation. Procedures were in place and being followed by qualified and knowledgeable maintenance and testing personnel. Good coordination between operations, maintenance, and engineering was observed. (Section M1.1)
- The licensee was in the process of establishing a program with the intent of meeting GL 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves." The licensee's long-term motor operated valves dynamic test plan for continued dynamic testing on a rotating 3-cycle basis was considered a positive aspect of the licensee's GL 96-05 program. (Section M1.2)
- The licensee identified that a shutdown cooling flow indicator on the alternate shutdown panel had been inoperable in excess of Technical Specification limits. Corrective actions were adequately implemented and addressed the root cause of the incident. A Non-Cited Violation (NCV) was identified. (Section M8.1)

Engineering

- Operations and maintenance did not adequately communicate during the troubleshooting of a problem with the 'B' hot leg injection valve (V3523). Operations considered the valve operable and believed the issue was only an indication problem. Subsequent investigation revealed V3523 was actually experiencing mechanical

difficulties. Engineering performed a detailed analysis of the issue and provided sound recommendations to restore confidence in the continued operation of the system. Additionally, the licensee's operability and reportability assessments were thorough. (Section E2.1)

- The licensee identified procedural deficiencies associated with the control room outside air intake radiation monitors. Technical Specification requirements for actuation set points and testing were not met. Two Non-Cited Violations were identified. Corrective actions were appropriate and the Licensee Event Report met all reporting requirements. (Section E8.2)

Plant Support

- Correct procedures were followed by the chemistry technician to collect a Unit 2 daily primary coolant sample and conduct analyses. The Unit 2 Hot Laboratory and equipment conditions were observed to be adequate for the performance of the work. The technician used appropriate methods to prevent unnecessary exposure and spread of contamination. Analysis results were properly reviewed, compared against trend data, and documented. (Section R4.1)
- The licensee had implemented a testing and maintenance program that ensured that the physical protection related equipment and security related devices were properly installed, tested, and maintained. (Section S2.2)
- Alarm stations and communication systems were effective and adequate to meet regulatory requirements and commitments of the licensee's Physical Security Plan. (Section S1.2)
- Compensatory measures observed and reviewed through documentation were appropriate and within the Physical Security Plan requirements. (Section 2.3)
- Security officers were appropriately trained and qualified. (Section S5.1)



Report Details

Summary of Plant Status

Both units operated at essentially 100% power for the entire report period, with no significant transients.

I. Operations

O1 Conduct of Operations

O1.1 Routine Observations of Control Room Operations (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent tours of the Main Control Room of both units during plant operations to verify proper staffing, operator attentiveness, adherence to procedures, communications, and command and control of activities.

The overall conduct of operations was professional and safety-conscious. Operators maintained good plant awareness throughout the steady state operations. Annunciator alarms and abnormal indications were promptly responded to and effectively resolved. Conservative decision making was observed with respect to TS action statements and equipment operability.

O2 Operational Status of Facilities and Equipment

O2.1 General Plant Tours (71707)

General tours of safety-related areas were performed by the inspectors throughout both units to examine the physical condition of plant equipment and to verify that safety systems were properly maintained and aligned. These general walkdowns included the accessible portions of safety-related structures, systems, and components.

Overall material conditions and housekeeping for both units were acceptable. Licensee efforts to recover from the recent Unit 2 refueling outage were generally very successful. Temporary trailers, containers, and equipment were removed, and almost all plant areas were clean to a level consistent with pre-outage conditions. During their tours, the inspectors identified some minor equipment and housekeeping problems which were reported to the licensee for resolution. Corrective actions and/or Condition Reports (CRs) were implemented to address these items.

O2.2 Safety-Related System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to conduct general walkdowns of accessible portions of the following safety related systems:

- Unit 1 and Unit 2 Seismic Instrumentation
- Unit 1 Post Accident Sampling System
- 2C Auxiliary Feedwater System
- Unit 1 and Unit 2 Boration Flow Path
- Unit 1 and Unit 2 Steam Generator Safety Valves
- Ultimate Heat Sink Structure and Valves



2.



Equipment operability, material condition, and housekeeping were acceptable. A minor procedural discrepancy for the seismic instrumentation was brought to the licensee's attention for correction. The inspectors identified no significant concerns as a result of these walkdowns.

O2.3 Unit 2 Hydrogen (H2) Analyzer and H2 Recombiner Walkdown

a. Inspection Scope (71707)

The inspector performed a detailed walkdown of the H2 analyzers and recombiners.

b. Observations and Findings

The inspector performed a detailed walkdown of accessible portions of the H2 analyzers and recombiners, and held discussions with the responsible instrumentation and control (I&C) and engineering personnel regarding system status. Completion of the 2B H2 analyzer monthly preventive maintenance was observed by the inspector and found to be performed satisfactorily as described in section M1.1 of this report. System lineup procedures, surveillance procedures, the Updated Final Safety Analysis Report, and Technical Specifications (TS) were reviewed for accuracy and consistency and found to be adequate. The interior of the H2 recombinder power supply and 2B H2 analyzer panels was inspected and found to be in good condition. The system configuration was verified in that switch, valve, and breaker positions were found to be in accordance with applicable system drawings and procedures. The most recent surveillance records were also reviewed by the inspector for completeness and TS compliance. Equipment operability, material condition, and housekeeping were acceptable. The inspector identified no significant concerns.

c. Conclusions

The H2 analyzers and recombiners were in an operable condition as identified through the review of documents, inspection of accessible system components, and interviews with responsible individuals. The material condition and housekeeping of these systems were also acceptable.

O2.4 Equipment Clearance Order (ECO) Reviews (71707)

Several ECOs were reviewed by the inspectors during the inspection period for technical and administrative adequacy. The following ECOs were reviewed:

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|---------------|---|
| • 1-99-01-35 | 'A' Waste Gas Compressor |
| • 2-98-12-237 | MV-08-3 Trip & Throttle Valve for 2C Auxiliary Feedwater Pump |
| • 2-99-01-11 | Motor Operated Valve MV-08-12 |
| • 2-99-01-12 | Motor Operated Valve MV-08-13 |



- 2-99-01-13 Motor Operated Valve MV-09-11
- 2-99-01-27 2B Charging Pump

The inspectors monitored one of the ECOs, 2-99-01-27, from the preparation phase to final closeout. This ECO was observed to be properly prepared, authorized, implemented, cleared, and closed out. The inspectors found the ECOs reviewed were technically adequate and the administrative details were performed in accordance with licensee's procedures.

O2.5 Freeze Protection (71714)

On January 4 and 5, the inspector verified that the licensee had completed the cold weather checklist, ADM-04.03, Revision 3, Cold Weather Preparations. Additionally, the inspectors performed a walkdown of instrumentation and piping for safety systems that were susceptible to cold weather effects. The inspectors only found minor deficiencies that were immediately corrected by the licensee. In general, the licensee had completed all cold weather preparations prior to the first expected cold weather conditions.

O4 Operator Knowledge and Performance

O4.1 Non-Licensed Operator Performance and Knowledge (71707)

During the inspection period, the inspectors accompanied three non-licensed operators (two Senior Nuclear Plant Operators and one Assistant Nuclear Plant Operator) on plant tours. The inspectors found the non-licensed operators (NLOs) to be knowledgeable of their assigned duties and plant conditions. The inspectors also noted that the NLOs frequently stopped to discuss ongoing maintenance activities with workers while in the field. Required plant tours conducted by the NLOs were generally thorough and complete. However, on several occasions the inspectors noticed the NLOs walking past minor plant deficiencies without attempting to initiate corrective actions. Examples of these deficiencies included several small valve packing leaks, multiple indicating lights not illuminated, and numerous plant lights that were burned out. The NLOs did not recognize these deficiencies until they were pointed out by the inspectors. Once the deficiencies were pointed out, the NLOs initiated the appropriate corrective actions. The inspectors concluded that although the NLOs performed their duties in a manner consistent with the Conduct of Operations procedure, they were not meeting the expectations of Operations Management regarding identification of minor equipment deficiencies. This issue was discussed with the Operations Manager who reaffirmed that the observed performance did not meet management expectations and that corrective actions would be initiated.

O8 Miscellaneous Operations Issues

O8.1 (Closed) Licensee Event Report (LER) 50-335/98-002-00: Containment Isolation Signal Bistable in Bypass Results in a Condition Prohibited by Technical Specification.

a. Inspection Scope (92901)

The inspector reviewed the LER and corrective actions. The inspector also verified that the LER met the requirements of 10 CFR 50.73.

b. Observations and Findings.

On January 5, 1998, the Assistant Nuclear Plant Supervisor identified, during an Equipment Out of Service (EOOS) Log review, that a containment radiation monitor was out of service and that the channel 'C' Containment Isolation Signal (CIS) had been bypassed for 58 hours while Unit 1 was in or above Mode 4. This exceeded the 48 hour limit allowed by the applicable Technical Specification 3.3.2.1 action statements.

Corrective actions included immediately restoring the radiation monitor to service, briefing Operations and the Shift Technical Advisors on the event, and revising the prestart checkoff and EOOS procedures to better track TS action statements that change with mode changes. Additionally, the licensee increased the level of review when equipment is placed out of service and for conditions when a TS action statement becomes applicable in a higher mode. Software changes for the EOOS Computer Log System were made to check for equipment affected by Technical Specification 3.0.4 prior to mode change authorization. An inspector verified that all corrective actions had been completed.

Leaving the 'C' CIS channel bypassed for 58 hours while in Mode 4 constituted a violation of Technical Specification 3.3.2.1. During the short time that the 'C' channel was bypassed in excess of the TS requirement, the high radiation CIS actuation logic remained in a two-out-of-three coincidence logic and the containment isolation function was available if required. This non-repetitive, licensee identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with section VII.B.1 of the NRC Enforcement Policy and is identified as NCV 50-335/98-12-01, Containment Isolation Signal Bistable Bypassed in Excess of Technical Specification 3.3.2.1 Action Statement Limit.

This LER met the requirements of 10 CFR 50.73. The inspector identified that the event description date incorrectly stated Unit 1 entered Mode 4 on January 5, 1998. The correct date was January 2, 1998. The inspector informed the licensee of this error. At the end of the report period, the licensee was in the process of revising the LER.

c. Conclusions

The licensee identified that TS limits on bypassing Containment Isolation Signal bistables had been exceeded. A Non-Cited Violation was identified. The Licensee Event Report met the requirements of 10 CFR 50.73 and correctly characterized the event. All corrective actions were completed satisfactorily.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Observations

a. Inspection Scope (61726 and 62707)

The inspectors observed all or portions of the following corrective and preventive maintenance and surveillance testing activities.



- Work Order (WO) 98025230 2B Hydrogen Analyzer Monthly Preventive Maintenance (PM)
- WO 98022680, 98015006, 98015166, and 98024950 2C Auxiliary Feedwater Motor Operated Valve PM
- PWO 616356 'A' Waste Gas Compressor
- WO 98025325 Reactor Protection System Monthly, Unit 2
- Operating Procedure 0360050 Ultimate Heat Sink Discharge Valves Surveillance Test

b. Observations and Findings

All maintenance and surveillance activities began with a tailboard meeting that thoroughly discussed the subject task. The inspectors observed that work was performed in accordance with work instructions, procedures, and applicable clearance controls. Responsible individuals conducting the maintenance work or surveillance testing were knowledgeable of the work they were performing, and exhibited a questioning attitude throughout the performance of their assigned job. The inspectors also noted that good coordination took place between operations, maintenance and engineering personnel, as applicable, to complete tasks. Furthermore, work activities were properly documented, and problems encountered during the performance of the work activities were appropriately resolved.

c. Conclusions

Maintenance and surveillance activities were performed and documented well. Procedures were in place and being followed by qualified and knowledgeable maintenance and testing personnel. Good coordination between operations, maintenance, and engineering was observed.

M1.2 Implementation of Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves"

a. Inspection Scope (Temporary Instruction 2515/140)

This inspection was conducted to assess the licensee's implementation of GL 96-05 and provide information pursuant to completion of a safety evaluation of the licensee's response to this GL. GL 96-05 requested licensees to establish programs to periodically verify that safety-related motor-operated valves (MOVs) are capable of performing their safety functions within the current licensing bases.

Prior to this inspection, the licensee responded to the recommendations of GL 96-05 in letters to the NRC dated October 28, 1996, and March 11, 1997, and described its long-term MOV periodic verification program. In addition to its specific plans for MOV periodic verification, the licensee noted in its letter dated March 11, 1997, that it was monitoring an industry-wide program developed by a Joint Owners Group (JOG). The JOG Program on MOV Periodic Verification was reviewed by the NRC staff and determined to be acceptable for addressing valve age-related degradation with certain conditions and limitations documented in a safety evaluation issued October 30, 1997.

The JOG program consisted of three phases: (1) an interim MOV static diagnostic test program with a test frequency based on the risk significance and capability margin of each GL 96-05 MOV; (2) a program of repetitive MOV dynamic tests at participating nuclear power plants with a total of more than 100 MOVs to be tested over a 5-year period; and (3) a long-term periodic test program based on the results of the MOV dynamic tests.

The inspection assessed the licensee's program to determine whether it was consistent with the licensee's commitments and with the recommendations of GL 96-05. The inspection was conducted through reviews of documentation and interviews with licensee personnel. In assessing the adequacy of the licensee's GL 96-05 program, the inspectors selected a sample of MOVs based on dynamic test data availability, valve type, and risk significance for evaluation of implementation of the program. The MOV sample was as follows:

- 2-V1476, Pressurizer Power-Operated Relief Valve (PORV) Block Valve (Westinghouse 3-inch flexible-wedge gate valve - medium risk category)
- 2-V1477, Pressurizer PORV Block Valve (Westinghouse 3-inch flexible-wedge gate valve - medium risk category)
- 2-V3664, Shutdown Cooling (SDC) Header Isolation Valve (Westinghouse 10-inch flexible-wedge gate valve - high risk category)
- 2-MV-14-17, Component Cooling Water (CCW) Header B Supply Fuel Pool Heat Exchanger Valve (Henry Pratt 12-inch butterfly valve - high risk category)
- 2-MV-08-13, Auxiliary Feedwater (AFW) Pump Turbine Steam Supply Valve (Anchor Darling 4-inch double disc gate valve - high risk category)
- 2-MV-09-09, 2A AFW Pump Flow Control Valve (WKM 4-inch globe valve - high risk category)
- 2-MV-09-11, 2C AFW Pump Flow Control Valve (WKM 4-inch globe valve - high risk category)

The inspectors reviewed test packages and calculations for the above MOVs as well as other MOV documents referred to in the subsequent paragraphs of this report.

b. Observations and Findings

1. Commitments to GL 96-05 (TI 2515/140, Paragraph 03.01)

In its response to GL 96-05, the licensee stated that it had reviewed the effectiveness of its MOV periodic verification program and had enhanced the program to incorporate guidance and information provided in GL 96-05 and industry experience. The licensee stated that the resulting program included a preventive maintenance program, and a mixture of static and dynamic (in-situ) diagnostic testing, to ensure that potential age-related degradations were identified. The licensee indicated that industry experience and initiatives, such as the JOG effort on periodic verification, would be monitored to ensure that the St. Lucie MOV program incorporated industry experience and lessons learned. The licensee did not specifically commit to implement the JOG program. The



licensee demonstrated that it was participating in the JOG program by testing assigned MOVs under dynamic conditions.

2. GL 89-10 Long-Term Actions (TI 2515/140, Paragraph 03.02)

In NRC Inspection Report (IR) 50-335, 389/98-06 (dated June 8, 1998), the NRC closed its review of the program implemented by the licensee in response to GL 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance," based on the licensee's actions to verify the design-basis capability of its safety-related MOVs. In IR 98-06, the inspectors identified several open items and noted other long-term planned actions by the licensee to ensure proper MOV performance. During this inspection, the inspectors verified that the licensee had satisfactorily addressed the open items and was implementing the long-term planned actions discussed in IR 98-06. Specific findings for the open items are described in E8.3.

The inspectors noted that the licensee was continuing the long-term planned actions discussed in IR 98-06. For example, Plant Manager Action Item (PMAI) Corrective Action PM97-10-133 (dated November 30, 1998) discussed activities to upgrade low-margin MOVs and to evaluate MOVs relying on a stem friction coefficient less than the design assumption of 0.2 in their capability calculations.

In GL 89-10, the NRC staff recommended that MOV performance be trended on a long-term basis. In Engineering Evaluation PSL-ENG-SEMS-97-018 the licensee specified that the engineering organization would trend valve factor, rate of loading, and unwedging load for gate and globe valves, and hydrodynamic torque, bearing coefficients and running torque for butterfly valves. PSL-ENG-SEMS-97-018 also stated that the engineering organization would compare MOV diagnostic test traces for anomalies. Further, PSL-ENG-SEMS-97-018 stated that the engineering organization would track and document age-related degradation margin, static and dynamic test results, and maintenance and modification activities for all GL 96-05 MOVs by preparation of a report within three months of each refueling outage. The inspectors noted that the licensee's guidance for MOV trending and monitoring did not provide details of how the parameters would be trended to verify specific aspects of MOV performance.

3. GL 96-05 Program (TI 2515/140, Paragraph 03.03)

In PSL-ENG-SEMS-97-018, the licensee described its GL 96-05 program to ensure continued design-basis capability of its safety-related MOVs. The licensee specified that its GL 96-05 program included (1) static and dynamic MOV diagnostic testing, (2) actuator inspection and refurbishment (if required) every outage for MOVs in severe environments and every other outage for MOVs in non-severe environments, (3) valve stem cleaning and lubrication every outage for each GL 96-05 MOV, (4) establishment of a goal of 10% margin to account for age-related degradation of MOV performance, (5) trending of MOV performance through review of test results and operating problems, and (6) performance of additional MOV testing as deemed appropriate. In reviewing the program and implementing documents, the inspectors found that the licensee's GL 96-05 program was being developed and implemented under the licensee's quality assurance program. The inspection findings for specific aspects of the licensee's GL 96-05 program were as follows:

Scope of MOVs included in GL 96-05 Program

PSL-ENG-SEMS-97-018 indicated that all safety-related MOVs at St. Lucie had been evaluated for inclusion in the GL 96-05 program. Further, it indicated that the criteria applied in this evaluation were consistent with the guidance provided in GL 96-05 regarding MOVs that were assumed to be capable of returning to their safety position when placed in a position that prevented their safety system (or train) from performing its safety function. The GL 96-05 program at St. Lucie included 141 safety-related MOVs. Based on a sample review of the MOVs, the inspectors found that the scope of MOVs included in the licensee's MOV program was consistent with the recommendations of GL 96-05.

MOV Design Basis

The licensee was maintaining its MOV calculations up to date with respect to new information on MOV capability. For example, the licensee had updated Calculation PSL-BFJM-93-029 (Revision 6, October 29, 1998), "NRC Generic Letter 89-10 Motor Operated Valve Diagnostic Test Results Evaluation," to address recent guidance from the actuator manufacturer on MOV motor actuator output. Based on the review of the sample MOVs, the inspectors found that the licensee was maintaining an up-to-date design basis for GL 96-05 MOVs.

Degradation Rate for Potential Increase in Valve Thrust or Torque Operating Requirements

The licensee stated that it planned to dynamically test assigned MOVs and provide the data to the JOG. Also, the licensee planned to use the test data which the JOG program obtained from other utilities. In PSL-ENG-SEMS-97-018, the licensee indicated that its GL 96-05 MOVs would be grouped and evaluated against the JOG test program results to establish degradation rates. The degradation rates for any St. Lucie MOV groups not included in the JOG program would be established by dynamically testing sample MOVs from each group on a rotating basis every third refueling cycle. PSL-ENG-SEMS-97-018 stated that the tested MOVs would include gate, balanced globe, and butterfly valves, and that low safety significant MOVs would continue to be included in the test population provided there was a clear benefit to safety or a contribution to the overall MOV program. The MOV grouping approach used in the licensee's program was developed in response to GL 89-10 and was documented in evaluations JPN-PSL-SEMP-94-027 (Unit 1) and JPN-PSL-SEMP-95-024 (Unit 2).

The licensee had not correlated in-plant valve tests with the individual MOV groups at St. Lucie so as to ensure that representative dynamic test data for each MOV in the St. Lucie GL 96-05 program were obtained. Representative dynamic test data were necessary in order to establish applicable degradation rates for the potential increase in valve thrust or torque operating requirements. Further, the licensee had not presented the available margins as part of the GL 96-05 program to justify that each MOV would continue to be capable of performing its safety functions despite potential degradation during performance of the dynamic testing program. As a result, the inspectors were not able to determine whether the licensee's planned testing would be sufficient to identify valve age-related degradation for each MOV or whether the capability margins of each MOV would be sufficient during the period while testing was being performed to establish the degradation rates. The inspectors identified this as an area requiring additional NRC assessment. Further details of the MOV capability margins,

representative MOVs to be tested for each group (including unbalanced globe valves), and the dynamic testing schedule will be necessary for the NRC to complete this review.

Degradation Rate for Potential Decrease in MOV Motor Actuator Output

In plant documents, such as Calculation PSL-BFJM-93-029, parameters were specified that would be monitored to identify potential degradation trends in MOV performance. These parameters included motor current, stem friction coefficient, and load sensitive behavior. However, the inspectors found that the licensee had not provided specific guidance as to how these parameters would be monitored and evaluated, such that motor actuator degradation trends in both the opening and closing directions could be identified and appropriate corrective action taken. The inspectors identified this as an area requiring additional NRC assessment.

St. Lucie Condition Report (CR) 96-2725-1 (September 3, 1998) described the licensee's actions in response to new information from the MOV actuator manufacturer on ac-powered MOV actuator output capability provided in Limitorque Technical Update 98-01 and its Supplement 1. As described in CR 96-2725-1, the licensee evaluated the operability of each safety-related MOV in response to the recent guidance on MOV actuator capability. The licensee determined that several MOVs might not have been capable of performing their design functions, such as Unit 2 MOVs V1476 and V1477 (LER 50-389/98-005-01, discussed in E8.4). The licensee took action to address the inadequacies in the capability of these MOVs, including identifying several MOVs to be modified to return their capability margin to the 10 percent goal. In addition, the licensee identified specific MOV calculations and evaluations to be revised based on the new information. From their reviews, the inspectors found that the licensee completed the MOV modifications and document revisions for the Unit 2 MOVs. In PMAI PM98-08-247, the licensee established a schedule of late January 1999 to complete the MOV document revisions for Unit 1 with MOV modifications to be completed during the fall 1999 refueling outage. From their review of the licensee's calculations and CR 96-2725-1, the inspectors found the licensee had adequately justified its determination of MOV motor actuator output, including its ongoing consideration of the new guidance on motor actuator output. The licensee was aware of the ongoing evaluation of dc-powered MOV actuator output by the actuator manufacturer.

Periodic Test Method

As described in PSL-ENG-SEMS-97-018, the licensee established an interim program of periodic static diagnostic testing to help monitor the capability margin of its GL 96-05 MOVs during performance of its dynamic test program. The licensee's MOV static diagnostic test program was based on MOV margin and risk ranking. The licensee also established a dynamic test program described in PSL-ENG-SEMS-97-018 which included sample testing for its MOV groups on a rotating 3-cycle basis. The ongoing rotating 3-cycle dynamic testing specified by the licensee was viewed positively by the inspectors, as it would provide evidence of dynamic MOV performance beyond a 5-year period.

In calculations PSL-2FJR-94-007 and 008 for Units 1 and 2, respectively, the licensee described its ranking of safety-related MOVs using probabilistic and deterministic insights. These calculations were completed in 1994 and the inspectors noted that more current risk ranking methodologies had been developed and approved for ranking GL 96-05 MOVs. The inspectors identified that the licensee's risk ranking methodology



would require further NRC review and comparison to current accepted industry methodologies. The inspectors identified this as an area requiring additional NRC assessment.

MOV Performance Evaluation

The licensee's calculations PSL-BFJM-93-029 and PSL-BFJM-94-016 provided guidance for evaluation of MOV performance during diagnostic testing. In addition, the licensee provided guidance for trending MOV performance in Administrative Procedure 0010023. The inspectors found that the licensee had included a review of the qualitative trending of MOV performance in the last "Annual MOV Problem and Failure Trend Report" and that quantitative trending of MOV performance had been included in the "Motor Operated Valve Report for Refuel Outage SL1-15." From their review of these reports the inspectors found that the licensee was evaluating MOV performance and providing feedback of MOV information into its program. As noted previously, a specific aspect of the licensee's monitoring and evaluation of the parameters to be used to trend MOV actuator output was identified for further NRC review.

MOV Test Interval

As previously mentioned, the inspectors found that the licensee had initiated an MOV interim static diagnostic test program which would be conducted coincident with a dynamic test program that included participation in the JOG program. The licensee's MOV static diagnostic test program specified that no test interval for an MOV would exceed 10 years. The licensee's dynamic test program specified sample tests of MOVs on a 3-cycle frequency. Based on the areas which were identified as requiring further NRC assessment in previous paragraphs, the inspectors were not able to determine at this time whether the periodic test interval would ensure that each GL 96-05 MOV at St. Lucie had continued design-basis capability until the next scheduled test.

c. Conclusions

Based on their review, the inspectors determined that the licensee was establishing a program with the intent of meeting GL 96-05. The licensee's long-term MOV dynamic test plan for continued dynamic testing on a rotating 3-cycle basis was considered a positive aspect of the licensee's GL 96-05 program.

The inspectors identified three areas which required further assessment before the NRC staff could complete a safety evaluation accepting the licensee's response to GL 96-05:

- MOV capability margins, representative MOVs to be tested for each group (including unbalanced globe valves), and the dynamic testing schedule to be used to establish appropriate degradation rates.
- Monitoring and evaluating MOV parameters to identify degradation trends.
- MOV risk ranking.

The NRC plans to address the above areas through a request for additional information.

M8 Miscellaneous Maintenance Issues (92902)

- M8.1 (Closed) LER 50-389/97-005: Past Inoperability of Flow Indicator (FI)-3306 Resulted In Operation Of Facility In A Manner Prohibited By Technical Specifications. On June 25, 1997, during an audit of completed work orders, the onsite Quality Assurance (QA) organization discovered that the Shutdown Cooling Flow indicator, FI-3306, on the Hot Shutdown Panel, had been inoperable from March 9 through May 9, 1997 without any evidence that the TS operability or reportability implications had been addressed. The FI-3306 indicator display had been replaced on March 9, 1997. An incorrect resistor caused FI-3306 to be miscalibrated resulting in an indicated flow much greater than actual flow. This condition was identified and repaired on May 9, 1997. However, FI-3306 had been inoperable for 60 days which exceeded the 30 days allowed by TS 3.3.3.5. At the time FI-3306 was repaired, responsible personnel did not initiate a Condition Report. Consequently, the licensee's corrective action process for assessing TS operability and regulatory reportability requirements was not employed.

Once identified by QA, a CR was promptly written to investigate the problem of FI-3306 inoperability. The licensee concluded the root cause of FI-3306 being inoperable involved significant weaknesses in the original work instructions and modification procedures. Additionally, Post Maintenance Testing was inadequate. To correct these problems, meetings were held with I&C planners and technicians to discuss the event, and applicable procedures were revised to ensure the correct resistor values and voltage output ranges for indicator display boards were incorporated. The licensee also addressed the personnel error of not initiating a CR when the incorrect resistor was replaced. An inspector reviewed LER 50-389/97-005, and associated completed Plant Manager Action Items (PMAIs). The inspector also reviewed the affected procedure revisions and interviewed responsible I&C personnel.

The inspector concluded that the corrective actions documented in LER 50-389/97-005 addressed the root causes of the event, and verified these actions had been fully implemented. The LER stated that the indicator being out of service would not have prevented placing the unit in hot shutdown. The described event constituted a violation of TS 3.3.3.5. However, this non-repetitive, licensee identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with section VII.B.1 of the NRC Enforcement Policy and is identified as NCV 50-389/98-12-02, Inoperable Shutdown Cooling Flow Indication On Hot Shutdown Panel.

III. Engineering**E2 Engineering Support of Facilities and Equipment****E2.1 Evaluation of 'B' Hot Leg Injection Valve Condition****a. Inspection Scope (37551)**

During December 1998, while restarting Unit 2 from SL2-11, the 'B' Hot Leg Injection Valve (V3523) experienced a dual position indication problem on several occasions before the problem was fully resolved. An inspector interviewed responsible Engineering, Work Control, and Operations personnel to determine the sequence of events involving the indication problem with V3523 and potential operability concerns. The inspector also reviewed the licensee's Engineering evaluations and decision

process to evaluate the effectiveness of licensee controls in identifying and resolving this problem.

b. Observations and Findings

On December 5, 1998, prior to entering Mode 4, valve V3523 was found to have dual position indication after operators attempted to close the valve. Work Request 98012631 was written on December 5, 1998, for Electrical Maintenance to troubleshoot the apparent indication problem. Electricians subsequently determined that the valve was physically not completely shut (mid position) as indicated. They then manually and electrically stroked the valve several times. During each attempted stroke by the electricians, the valve operated properly by going fully closed. After completing their troubleshooting activities, the electricians surmised that foreign material had caused V3523 to not fully shut, and after several strokes the material had apparently been removed. The work order accurately documented the valve problem, but maintenance personnel did not adequately communicate to Operations some of the actual conditions observed during the work. Based upon restoration of valve position indication, Operations declared the valve operable. The work order had not yet been processed for closure.

A short time later, while still preparing to enter Mode 4, the licensee observed that V3523 had dual position indication again. Operators attempted to cycle V3523, and were able at one point to locally verify the valve was closed but the dual remote position indication remained. Based upon local indication, Operations concluded that the valve was operable, and the remote dual position indication was just an indication problem.

After a few shifts, while in Mode 3 with primary pressure approximately 1750 pounds per square inch (psi), operators opened V3523 to recirculate the hot leg injection header. Although the dual position indication returned when operators attempted to reclose the valve, local verification of valve position was not performed. The operators concluded the valve was operable and the dual position indication was caused by the same remote indication problem that had occurred earlier. During the troubleshooting effort, the valve was stroked several times and the licensee completed the TS surveillance requirement. At this time there was no concern within the Operations organization regarding valve operability.

On December 16, 1998, while troubleshooting the V3523 indication problem once again, per Work Order 98024151, Engineering and Electrical Maintenance (EM) personnel discovered that V3523 was actually 10 percent open. This was contrary to Operations' belief that the valve was fully closed. Engineering and EM subsequently determined that the motor operated valve (MOV) torque switch was arresting valve travel while it was still partially open. Test data indicated that the MOV loading was inconsistent from stroke to stroke, and was most likely due to some internal valve or valve stem binding. Engineering became concerned that one possible failure mode was a separation of the disk from the stem which could obstruct hot leg injection. Operations subsequently aligned the system to pass flow through V3523 and confirmed that the disk was not detached from the stem.

The results of the testing and direct observation of the valve gave Engineering a reasonable assurance that the valve would have opened if called upon, and would pass the required amount of flow. However, Engineering expressed a concern about the continued ability of the valve to open in a reliable manner. Engineering then performed

a safety evaluation, PSL-ENG-SEMS-98-119, to recommend locking V3523 in its required throttled-open safety position, and to de-energize and lock closed the downstream valve. With both valves de-energized, and V3523 locked in its safety required position, this would meet the single active failure criteria and still allow operators to initiate hot leg injection as needed. The inspector reviewed the safety evaluation and found that information was complete and reasonable. All pertinent considerations were addressed and appropriate actions recommended. On December 17, 1998, Operations implemented the Engineering department recommendations.

The licensee determined that there was no immediate operability concern with the valve failing to be fully closed. Containment isolation was maintained by an operable downstream check valve. Also, high pressure safety injection (HPSI) was not affected due to the redundant motor operated valve downstream of V3523. This would have prevented premature use of the hot leg injection flow path. Additionally, there was no indication that V3523 would not have opened to its required position. The inspectors reviewed this information and did not identify any deficiencies in the licensee's safety assessment. The licensee also determined that this event was not reportable. The inspector reviewed the requirements of 10 CFR 50.72 and 50.73 and came to the same conclusion.

In January 1999, the inspector interviewed several of the responsible licensed Reactor Operators and Senior Reactor Operators to determine why Operations did not initially recognize that V3523 was experiencing mechanical problems. Operations did not understand that the electricians had actually found the valve stuck partially open when the original problem occurred. That, and the intermittent nature of the failure mode, led them to believe it was only an indication problem. The lack of clear communications between Operations and EM led to a misdiagnosis of the V3523 problem and failure to initially recognize the potential operability issues. The Operations department has since issued multiple Plant Manager's Action Items to evaluate the lessons learned from this event and implement corrective actions.

c. Conclusions

Operations and maintenance did not adequately communicate during the troubleshooting of a problem with the 'B' hot leg injection valve (V3523). Operations considered the valve operable and believed that V3523 was only having indication problems. Subsequent investigation revealed V3523 was actually experiencing mechanical difficulties. Engineering performed a detailed analysis of the 'B' hot leg recirculation issue and provided sound recommendations to restore confidence in the continued operation of the system. Additionally, the licensee's operability and reportability assessments were thorough.

E8 Miscellaneous Engineering Issues

E8.1 (Closed) IFI 50-335/98-02-01: Feedwater Recirculation Valve Corrective Actions.

a. Inspection Scope (92903)

The Inspector Followup Item (IFI) involved a long standing deficiency with the main feedwater pump recirculation system. Four recent plant trips had occurred in which one or both of the main feedwater (MFW) pumps tripped due to low flow. The inspector

discussed the completed modifications on Unit 2 with the system engineer, reviewed the Plant Change/Modification (PC/M) and work orders associated with the modification, and discussed the upcoming modification on Unit 1 with the engineer and work control.

b. Observations and Findings

The inspector reviewed PC/M 98-047, Feedwater Pump Recirculation Modification, that was implemented during SL2-11. This package appeared complete and detailed. An engineering evaluation in the PC/M discussed the history of feedwater pump trip problems that have occurred following a trip of the main turbine. In the original MFW system design, the MFW recirculation valves were supposed to open following a turbine trip in order to maintain 3750 gallons per minute total MFW pump flow once the MFW regulating valves went closed. However, the MFW recirculation valves would come open within about 10 seconds after a turbine trip, and then modulate closed because of the long time it took the MFW regulating valves to close (about 19 to 23 seconds). By the time the MFW regulating valves went fully closed, the recirculation valves would also be closed and could not reopen quickly enough to maintain minimum MFW pump flow. Consequently, the MFW pumps would trip on low flow.

The above PC/M changed the circuitry to cause the recirculation valve to open upon a turbine trip signal until manually reset by the operator, or until the turbine trip signal was reset. This effectively ensured that there would always be sufficient MFW flow to keep the pump online and prevent low flow conditions.

The inspector discussed the planned Unit 1 modifications with Engineering and Work Control. Both groups stated that the project was planned for the Fall 1999 outage (SL1-16). Although the PC/M had not yet been assigned a number, plans were advancing to complete the modification. Based upon the completed and planned corrective actions, this IFI is closed.

c. Conclusions

The inspectors reviewed the completed and planned modifications to the feedwater recirculation valve control circuitry to correct a long standing equipment design deficiency. The inspectors found the engineering packages complete and detailed. The modification appeared to effectively resolve the design deficiency that had caused numerous inadvertent main feedwater pump trips after turbine trips.

E8.2 (Closed) LER 50-389/98-002-00: Radiation Monitor Surveillance Inadequacies Led to Operation of Facility Prohibited by Technical Specifications.

a. Inspection Scope (92903)

The inspectors reviewed the subject LER and corrective actions. The inspector also verified that the LER met all the requirements of 10 CFR 50.73.

b. Observations and Findings

The LER documented two reportable events that occurred involving the Control Room Outside Air Intake (CROAI) radiation monitors within a ten day period. On February 24, 1998, the system engineer discovered the first of two surveillance procedure deficiencies. The CROAI surveillance procedure failed to verify the radiation monitor trip



set points. Technical Specification Table 3.3-6 required that the control room isolation monitor alarm/trip set points be less than or equal to two times background. The surveillance procedure had been revised in 1994 to permanently set the alarm points at 125 counts per minute (which was five times greater than current background), and deleted the requirement to verify that the set point remained consistent with background levels.

To correct this problem, the licensee revised the procedure to once again verify the set points and to maintain the values less than or equal to twice the background. The recorders were subsequently restored to service. All other radiation monitor set points were reviewed to determine generic implications. The inspector verified that all scheduled corrective actions were completed. No other problems were identified.

The inspector reviewed the design basis documents and the Updated Final Safety Analysis Report (UFSAR). The design basis documents stated the alarm set points were chosen to be twice background levels in order to ensure that the radiation levels were as low as possible, but high enough that the number of nuisance alarms and unnecessary equipment actuations would be minimized. The UFSAR description stated that the system was designed to meet 10 CFR 50, Appendix A, General Design Criteria (GDC) 19 dose limits for operators in the control room during a design basis accident. Considering the relatively low contamination levels associated with a setpoint of 125 cpm, and the very conservative nature of the TS limit, the licensee concluded GDC 19 dose limits would not have been exceeded. The inspectors also concluded this event had little safety significance.

However, setting the CROAI radiation monitor set points at greater than twice background since 1994 is a violation of Technical Specification Table 3.3-6. This non-repetitive, licensee identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with section VII.B.1 of the NRC Enforcement Policy and is identified as NCV 50-335/98-12-03, Control Room Outside Air Intake Radiation Monitor Trip Point Set Greater than Technical Specifications Limit.

The second surveillance discrepancy was identified during the investigation of the first and was identified by the system engineer on March 5, 1998. Technical Specification Table 4.3-3 requires that a channel calibration for the CROAI radiation monitors be performed on a refueling interval periodicity. The channel calibration surveillance requirement included testing the actuation logic. Procedure 2-1400069, Calibration of the PSL-2 Control Room Air Intake Monitors, was intended to satisfy this requirement. However, this procedure did not test the electrical contacts that actuate the Control Room Emergency Cleanup System (CRECS).

The licensee successfully tested the contacts later that same day and subsequently returned all radiation monitors back into service. The inspector verified that all corrective actions, including procedure changes and a review of all other radiation monitors, had been completed.

The UFSAR did not credit the CROAI radiation monitors for actuation of the CRECS in any of its accident analyses. According to these analyses, the Containment Isolation Actuation System provided the primary signal. The CROAI radiation monitors only provided a backup signal for actuating CRECS. Furthermore, the electrical contacts were subsequently tested satisfactorily. Therefore, this event had little safety significance.

Failure to adequately test all portions of the actuation logic for the CROAI radiation monitors is a violation of Technical Specification Table 4.3-3. This non-repetitive, licensee identified and corrected violation is being treated as a Non-Cited Violation (NCV), consistent with section VII.B.1 of the NRC Enforcement Policy and is identified as NCV 50-335/98-12-04, Failure to Adequately Test the Actuation Logic for the Control Room Emergency Cleanup System.

The inspector verified that the LER met the requirements of 10 CFR 50.73.

c. Conclusions

The LER documented two reportable events associated with the control room outside air intake radiation monitors. In both events, procedural deficiencies were the root cause which failed to adequately set the alarm and actuation set points, and failed to test the alarm/trip output contacts, per Technical Specification requirements. Two Non-Cited Violations were identified. Corrective actions were appropriate and the LER met all reporting requirements.

E8.3 (Closed) IFI 50-335, 389/98-06-04: Completion of Motor Operated Valve Program Follow-up Items.

This item was opened pending completion of licensee actions to address four motor-operated valve (MOV) issues. The actions included modifications, tests, evaluations, ongoing reviews of industry data, and changes to plant documents to provide additional assurance that specified MOVs would be capable of performing their design-basis functions. The inspectors reviewed the licensee's actions and concluded that the issues were satisfactorily addressed. The inspectors findings for each issue were as follows:

Issue 1 - Inadequate Close Valve Factors for Valves 2-MV-08-12/13

This issue involved a concern that the close valve factor used to calculate stem thrust requirements for double disk gate valves 2-MV-08-12/13 might be too low. This could result in closing stem thrust requirements insufficient to wedge the valve disks and preclude excessive leakage. In response to the issue, the licensee indicated that program documents and thrust calculations would be revised to establish minimum thrust requirements that would ensure adequate mechanical wedging of the valve disks to prevent leakage under design-basis conditions.

The inspectors found that the licensee had satisfactorily resolved this issue. Calculation PSL-2FJM-91-048, "St. Lucie Unit 2 Generic Letter 89-10 Gate and Globe Valve Required Stem Thrust and Actuator Torque Switch Setting Evaluation," Revision 14, had been revised to increase the thrust requirements; the Total Equipment Data Base had been revised to specify these higher values; and the valves had been dynamically tested December 6, 1998 (Work Orders 98002590 and 98002591), to demonstrate that adequate wedging was obtained. The inspectors reviewed the diagnostic trace obtained during the dynamic test on valve 2-MV-08-12 and confirmed satisfactory wedging.

Issue 2 - Inadequate Close Margin for Valves 2-MV-08-1A/B

This issue involved a concern that globe valves 2-MV-08-1A/B had inadequate actuator thrust capabilities to assure they would perform their safety function. The licensee had declared these valves inoperable and issued modification package PC/M 98014 to

implement actions that would decrease the thrust required for the valves to perform their close safety function.

The inspectors verified that the licensee had completed the modifications through a review of the modification records, which were documented on Work Orders 98005140 and 98005141. The modifications consisted of reversing the valves to have flow assist their closing safety function. The inspectors reviewed the results of a post modification dynamic diagnostic test performed on valve 2-MV-08-1A and verified that it demonstrated that the valves had adequate capability margin to close.

Issue 3 - Long Term Plans Where EPRI PPM is Considered "Best Available Data"

This issue involved concern that the licensee had used the Electric Power Research Institute (EPRI) MOV Performance Prediction Methodology (PPM) to determine thrust requirements for certain valves as "best available data" even though all conditions for application of the PPM were not met. The inspectors reviewed the actions which the licensee had implemented for the valves and determined that they were appropriate to address the concern. These actions are discussed below:

- Valves Addressed by Monitoring Industry Data

As discussed in Inspection Report 50-335, 389/98-06, the licensee had established plans in PMAI PM 98-04-071 to monitor industry sources for additional data to support use of the PPM to determine thrust requirements for several groups of valves with design conditions not covered by the PPM.

The inspectors found that the licensee had further implemented this monitoring through Engineering Evaluation PSL-ENG-SEMS-97-018, Revision 5. This evaluation specified long-term monitoring and evaluation of industry data for the following valves and conditions, with the results to be documented in the licensee's MOV post outage reports:

- Valve 1-V3480 (Deloro hard facing on guides and disk seating surfaces)
- Valves 1-MV-15-1 (inverted wedge guide design)
- Valves 1-MV-09-1, -2, -7, and -8 (20-inch size)

The inspectors verified that the specified on-going monitoring and evaluation had been documented in the most recently completed MOV post outage report, "Report Refuel Outage SL1-15," dated June 18, 1998.

- Valves Addressed Through Margin Increases and Dynamic Tests

Globe valves 2-MV-08-1A/B operate under steam (compressible flow) conditions. The PPM was not validated for globe valves which operate in compressible flow applications. As discussed in NRC Inspection Report Nos. 50-335, 389/98-06, the licensee was to modify these valves to increase their margin and then dynamically test the valves to establish design-basis settings. The inspectors verified that the licensee had modified and dynamically tested these valves, as described under Issue 2 above. The valves were demonstrated to have satisfactory settings.



Issue 4 - Power Operated Relief Valve (PORV) Block Valve Long Term Plan

This issue involved concern that the Unit 2 PORV block valves (2-V1476, and 2-V1477) would not have sufficient thrust capabilities at design basis conditions. The licensee committed to determine if modifications were needed. The inspectors found that the licensee had determined that modifications were needed and that these modifications had been completed. The inspectors verified the modifications through a review of Change Request Notice 98-013-8107, approved October 15, 1998, which specified the modifications; and Work Orders 98005023 and 98005024, which completed gear changes required for the modifications. These modifications also provided corrective actions reported in LER 50-389/98-005-01, as noted in E8.4. This IFI is closed

- E8.4 (Closed) LER 50-389/98-005-00,-01: New MOV Methodology Caused Past PORV Block Valve Operability Problems. This LER was identified through a review conducted by the licensee in response to NRC Information Notice (IN) 96-48, Supplement 1 "Motor Operated Valve Performance Issues." This LER identified that the actuators of the Unit 2 power operated relief valve (PORV) block valves did not have sufficient thrust capabilities to assure closure under worst-case design basis conditions. The event and the original revision of the LER (LER 50-389/98-005-00) were the subjects of NRC Inspection Report 50-335, 389/98-13. The NRC concluded that while a violation did occur, enforcement discretion was warranted and issuance of a Notice was not appropriate in this case. In addition, the corrective actions implemented and planned to be implemented were found reasonable to prevent recurrence of the event. The LER was to remain open pending review of final corrective actions. The licensee subsequently issued a revision to the LER, identified 50-389/ 98-005-01, which altered the description of the safety significance of the event.

The principal corrective actions that remained to be completed for this LER were modifications to assure the block valves were capable of performing their design-basis functions and incorporation of the information referred to IN 96-48, Supplement 1, into the licensee's MOV program. The inspectors verified that the modifications had been completed through the review of modification records described in E8.3. The inspectors also reviewed the following MOV program documents and verified that they incorporated the information referred to IN 96-48, Supplement 1:

- Mechanical Standard STD-M-03, "Engineering Guidelines for Sizing and Evaluation of Limitorque Operators," Revision 4
- Calculation PSL-2FJM-91-048, "St. Lucie Unit 2 Generic Letter 89-10 Gate and Globe Valve Required Stem Thrust and Actuator Torque Switch Setting Evaluation," Revision 14

Corrections to the Unit 1 program documents were not complete but the inspectors verified that these corrections were being tracked through PMAI PM98-08-247. The inspectors concluded that the licensee had satisfactorily implemented corrective actions to close these items.

IV. Plant Support

R4 Staff Knowledge and Performance in Radiation Protection and Chemistry

R4.1 Unit 2 Primary Chemistry Sample Observation

a. Inspection Scope (71750)

On January 13, 1999, an inspector observed a chemistry technician draw a primary plant (reactor coolant) sample and analyze it. Primary sample results were reviewed to verify proper evaluation and trending by licensee personnel. The status of the primary chemistry laboratory and equipment was also examined by the inspector.

b. Observations and Findings

The inspector reviewed the procedures used to control primary chemistry sampling to verify completeness, accuracy, and that they were the proper revision. Applicable procedures were found to be adequate. A minor procedural reference error was identified and reported to the licensee.

A chemistry technician drew the primary sample per Chemistry Operating Procedure (COP) 2-COP-02.02, Revision 5, Unit 2 Primary Systems Sampling. The technician properly utilized the procedures, following the precautions and limitations, and coordinated with operations to draw the sample.

The inspector observed the condition of the Unit 2 primary sample laboratory was acceptable. Laboratory housekeeping was well maintained, equipment was properly calibrated and their material condition was adequate, sample analysis chemicals were readily available and not expired, and sufficient supplies were present to correctly and efficiently complete the analyses. During the sample analysis, the technician inadvertently knocked the sample container lid onto the laboratory floor. The technician's response to mitigate the spill was appropriate, and involved Health Physics support to limit the spread of contamination.

Sample analyses were properly performed by the technician in accordance with approved guidelines. The chemistry technician compared the analysis results with those of past samples for trend evaluation and appropriately dispositioned his concerns. Results were reviewed by the inspector and found to meet Technical Specification requirements and the requirements of COP-05.04, Revision 5, Chemistry Department Surveillances and Parameters, Appendix D.

c. Conclusions

Correct procedures were followed by the chemistry technician to conduct a Unit 2 daily primary sample and analyses. The Unit 2 Hot Laboratory and equipment conditions were observed to be acceptable for the performance of the primary samples and analyses. The technician used appropriate methods to prevent unnecessary exposure and spread of contamination. Analysis results were properly reviewed, compared against trend data, and documented.



R8 Miscellaneous Radiation Protection and Chemistry Issues**R8.1 (Closed) LER 50-335, 389/98-006-00: Missed Emergency Diesel Generator (EDG) Fuel Oil Sample Surveillance Due to Personnel Error.****a. Inspection Scope (92904)**

The inspector reviewed the LER and its associated corrective actions.

b. Observations and Findings

On April 21, 1998, the Nuclear Plant Supervisor (NPS) was informed of a missed surveillance on new EDG fuel oil that was delivered on February 17, 1998. The St. Lucie Unit 1 and 2 Technical Specification (TS) Surveillance 4.8.1.1.2.c.2 requires verification of specified EDG fuel oil properties within 31 days of obtaining a new EDG fuel oil sample. The EDG fuel oil sample results were received on February 27, 1998 from a laboratory that analyzed the sulfur content using an ASTM D4294-90 method, which was not a TS allowed methodology.

The NPS invoked TS 4.0.3 in response to the notification of the methodology error associated with the sulfur content analysis in order to complete the required actions for the missed surveillance. The vendor laboratory was notified to re-analyze the February 17, 1998 EDG fuel oil sample for sulfur content per ASTM D2622-82. TS 4.0.3 was exited later that same day when the laboratory notified the NPS that the sample results for sulfur were within the prescribed requirements.

This event was caused by a combination of cognitive personnel error on the part of the vendor and procedural inadequacies for site verification of the fuel oil sample results. The inspector verified that the EDG fuel oil receiving procedure was revised to ensure that each analysis is performed correctly and that the results are within the required specifications. Furthermore, the inspector verified that the procedure was revised to include prompt notification and condition report (CR) initiation upon discovery of a TS parameter found out of specification to allow for corrective actions to be performed within the time frame allowed by the TSs.

TS Surveillance 4.8.1.1.2.c.2 requires the verification of specified EDG fuel oil properties within 31 days of obtaining the new EDG fuel oil sample. The licensee identified that the sulfur content analysis was performed using a method that was not approved by the TS, and consequently missed the TS surveillance requirement. Subsequent testing indicated that the fuel was acceptable. This event constitutes a violation of minor significance and is not subject to formal enforcement action.

c. Conclusions

A TS surveillance was missed in that a fuel oil sulfur analysis was not performed using a test method specified by the TS. Immediate corrective actions were taken to satisfy the TS requirements and appropriate long-term corrective actions to prevent recurrence were developed and fully implemented. This event was identified as a minor violation.

S1 Conduct of Security and Safeguards Activities**S1.2 Alarm Stations and Communications****a. Inspection Scope (81700)**

The licensee's established security alarm stations and security communications were observed by the inspector to verify compliance with regulatory requirements and commitments contained in the licensee's NRC-approved Physical Security Plan (PSP).

b. Observations and Findings

Review of security operational activities in the Central Alarm Station (CAS) and Secondary Alarm Station (SAS) and monitoring of security communications during the course of the inspection confirmed that the alarm stations were equipped in accordance with commitments contained in the PSP. Both alarm stations were capable of communicating and effectively controlling the security force during routine and contingency operations. Alarm station operators were observed to be adequately trained and capable of effectively monitoring access control, intrusion detection and communications with other available officers. The inspector determined the CAS and SAS were independent and diverse to the extent that no single act could remove the capability of the security force to call for assistance or otherwise respond to a threat. There were no operational activities observed in the alarm stations that would interfere with the execution of response to alarms or other contingencies. Alarms annunciated audibly and visually within the required timeframe. The alarm stations were continually manned by capable and knowledgeable alarm station operators.

c. Conclusions

The inspector concluded that the licensee's alarm stations and communication systems were effective and adequate to meet regulatory requirements and commitments of the licensee's Physical Security Plan.

S2 Status of Security Facilities and Equipment**S2.1 Protected Area and Vital Area Barrier Walkdown (71750)**

The inspectors performed a walkdown of the vital and protected area barriers. The inspector did not identify any damage or degradation to the fences. The inspector noted that the isolation zones were generally free of objects, clearly marked, and of sufficient size to be clearly observed from the alarm stations. The inspector concluded that the vital area and protected area barriers continued to meet the requirements in the security plan.

S2.2 Testing and Maintenance

a. Inspection Scope (81700)

The inspector reviewed the licensee's testing and maintenance program for selected security equipment to assess compliance with the provisions specified in the PSP.

b. Observations and Findings

The inspector reviewed operability test records for the period of December 20, 1998 through January 3, 1999. Equipment included protected area intrusion detection, lighting, vital area doors, Safenet, security weapons, vital area barrier system components, and hand geometry units. The PSP and implementing procedure Security Force Instruction (SFI) 3, "The Electronic Security System," Appendix E, Revision 32, dated December 31, 1998, outlined the requirements that the licensee perform operability tests every seven days on security related equipment.

Additionally, the inspector reviewed the Security Event Logs (SELs) for the last quarter of 1998 in comparison to security maintenance work orders and determined that security equipment that was less than adequate and failed to meet PSP commitments had been logged appropriately. Prior to early November 1998, the licensee implemented Trouble Reports for security related equipment that was degraded. On November 6, 1998, the licensee implemented Administrative Procedure 06.02, Revision 0, to more effectively track and schedule maintenance work that is required to be performed.

Condition Report 98-2075 was issued on January 11, 1999, to document an anomaly that occurred on exit hand geometry reader 101. During annual probability detection testing December 9-11, 1998, the licensee noted that exit handreader 101 allowed the I&C technician to exit the protected area with a keycard/badge other than his own. The licensee immediately took the handreader out of service and re-enrolled the technician's hand. The test was re-performed with the same results. As part of the corrective action review, the licensee determined that the I&C technician conducting the test and another individual possessed similar hand characteristics which gave a false accept during the annual probability of detection test. Corrective action instituted by the licensee included giving the other individual a new keycard and re-enrolling that individual's hand to better quantify the parameters. Testing was conducted a third time with successful results and the handreader was put back in service. On January 6, 1999, the inspector observed the licensee test reader 101 of the hand geometry system utilizing the same I&C technician and six valid keycards. The cards included the card of the individual which was originally used during the annual probability detection test. All six keycards did not grant the technician exit of the protected area.

c. Conclusions

The inspector concluded that the licensee had implemented a testing and maintenance program that ensured that the physical protection related equipment and security related devices were properly installed, tested and maintained.

S2.3 Compensatory Measures

a. Inspection Scope (81700)

The inspector evaluated the licensee's implementation of compensatory measures to determine compliance with applicable procedures and the licensee's PSP.

b. Observations and Findings

The inspector performed a review of selected documentation for compensatory posts established for degraded or inoperable security equipment. All compensatory posts established were within the requirements specified in the PSP, Section 3. During the course of the inspection, the inspector observed one compensatory post in place for a degraded microwave unit. Compensatory posts established were appropriately logged in the SELs.

The licensee had significantly reduced the number of compensatory hours due to degraded security equipment from 1137 hours in 1997 to 889 hours in 1998.

c. Conclusions

Compensatory measures observed and reviewed through documentation were appropriate and within the PSP requirements.

S5 Security Safeguards Staff Training and Qualification

S5.1 Security Training and Qualification

a. Inspection Scope (81700)

The inspector evaluated the licensee's Training and Qualification Program for security officers in accordance with the Training and Qualification Plan (TQP), Revision 19, dated August 26, 1998.

b. Observations and Findings

The inspector reviewed 11 training files of former and currently employed security officers to ascertain whether qualification scores and assigned duties, physical fitness test results, and weapon requalification scores met the requirements of the TQP. All records reviewed reflected accurate record keeping and compliance with the provisions of the TQP. Additionally, the inspector interviewed four officers to determine depth of knowledge of requirements. Officers interviewed and observed in the course of their duty were knowledgeable and cognizant of their responsibilities.

The inspector toured the range and observed two officers qualify on recently purchased new semi-automatic weapons. The inspector observed that training on the new weapon was detailed and appropriate.

On Thursday, January 7, 1999, the inspector observed the licensee perform a test on the simulator which proposed a vital target set attack by the design basis threat (DBT). The licensee had been utilizing the simulator to validate target set analysis and better understand contingency response in preparation for the upcoming Operational

Safeguards Response Evaluation. Operations and Security have been working together to ensure all avenues of targets and approach by the DBT are explored and that officers are cognizant of the functions of vital area equipment to be protected.

c. Conclusions

Through document review, interview of security officers and observation of security officers performing tasks and duties, the inspector determined that the St. Lucie security officers were appropriately trained and qualified to perform their duties in accordance with the licensee's TQP.

V. Management Meetings and Other Areas

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on January 26, 1999. Interim exit meetings were held on January 8 and January 14, 1999 to discuss the findings of Region based inspectors. The licensee acknowledged the findings presented.

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

PARTIAL LIST OF PERSONS CONTACTED

Licensee

M. Allen, Operations Manager
 C. Bible, Site Engineering Manager
 G. Bird, Security Manager
 W. Bladow, Site Quality Manager
 D. Fadden, Training Manager
 D. Faulkner, Chemistry
 J. Holt, Maintenance Manager
 H. Jacobs, Mechanical Maintenance Supervisor
 E. Katzman, Supervisor, Health Physics & Chemistry
 W. Korte, Electrical Maintenance Supervisor
 C. Ladd, Operations Supervisor
 R. McCullers, Supervisor, Health Physics
 H. Mercer, Technical Supervisor, Health Physics
 K. Mohindroo, Plant Engineering Manager
 M. Moran, Operations Support Engineering Manager
 T. Patterson, System Engineering Manager
 A. Pawley, I&C Maintenance Supervisor
 A. Scales, Assistant Operations Supervisor
 A. Stall, St. Lucie Plant Vice President
 E. Weinkam, Licensing Manager
 C. Wood, Work Control Manager
 R. West, St. Lucie Plant General Manager

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation, and corporate personnel.

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
 IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems
 IP 61726: Surveillance Observations
 IP 62707: Maintenance Observations
 IP 71707: Plant Operations
 IP 71714: Cold Weather Preparations
 IP 71750: Plant Support Activities
 IP 81700: Physical Security Program for Power Reactors
 IP 92700: Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
 IP 92702: Followup on Corrective Action For Violations and Deviations
 IP 92901: Followup - Plant Operations
 IP 92902: Followup - Maintenance
 IP 92903: Followup - Engineering
 IP 92904: Followup - Plant Support
 TI 2515/140 Implementation of Generic Letter (GL) 96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves"

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-335/98-12-01	NCV	Containment Isolation Signal (CIS) Bistable Bypassed in Excess of Technical Specification 3.3.2.1 Action Statement Limit (Section O8.1)
50-389/98-12-02	NCV	Inoperable Shutdown Cooling Flow Indication On Hot Shutdown Panel (Section M8.1)
50-335/98-12-03	NCV	Control Room Outside Air Intake Radiation Monitor Trip Point Set Greater than Technical Specifications Limit (Section E8.2)
50-335/98-12-04	NCV	Failure to Adequately Test the Actuation Logic for the Control Room Emergency Cleanup System (Section E8.2)

Closed

50-335/98-002	LER	CIS Bistable in Bypass Results in a Condition Prohibited by Technical Specification (Section O8.1)
50-389/97-005	LER	Past Inoperability of FI-3306 Resulted In Operation Of Facility In A Manner Prohibited By Technical Specifications (Section M8.1)
50-389/98-002	LER	Radiation Monitor Surveillance Inadequacies Led to Operation of Facility Prohibited by Technical Specifications (Section E8.2)
50-335,389/98-006	LER	Missed Emergency Diesel Generator (EDG) Fuel Oil Sample Surveillance Due to Personnel Error (Section R8.1)
50-335/98-12-01	NCV	CIS Bistable Bypassed in Excess of Technical Specification 3.3.2.1 Action Statement Limit (Section O8.1)
50-389/98-12-02	NCV	Inoperable Shutdown Cooling Flow Indication On Hot Shutdown Panel (Section M8.1)
50-335/98-02-01	IFI	Feedwater Recirculation Valve Corrective Actions (Section E8.1)
50-335/98-12-03	NCV	Control Room Outside Air Intake Radiation Monitor Trip Setpoint Greater than Technical Specifications Limit (Section E8.2)
50-335/98-12-04	NCV	Failure to Adequately Test the Actuation Logic for the Control Room Emergency Cleanup System (Section E8.2)
50-335, 389/98-06-04	IFI	Completion of Motor Operated Valve Program Follow-up Items (Section E8.3)
50-389/98-005-01	LER	New MOV Methodology Caused Past PORV Block Valve Operability Problems (Section E8.4)
50-389/98-005-00	LER	New MOV Methodology Caused Past PORV Block Valve Operability Problems (Section E8.4)