APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-498/94-19
50-499/94-19

Licenses: NPF-76
NPF-80

Licensee: Houston Lighting & Power Company
P.O. Box 1700
Houston, Texas

Facility Name: South Texas Project Electric Generating Station, Units 1 and 2

Inspection At: Matagorda County, Texas

Inspection Conducted: May 16-20, with in-office inspection until July 8, 1994

Inspectors: L. E. Ellershaw, Reactor Inspector, Maintenance Branch
Division of Reactor Safety

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Approved: Dale A. Powers 07/18/94
Dr. Dale A. Powers, Chief, Maintenance Branch Date
Division of Reactor Safety

Inspection Summary

Areas Inspected (Units 1 and 2): Routine, announced inspection of the licensee's inservice testing of pumps and valves with particular emphasis on the licensee's implementation of the positions discussed in NRC Generic Letter 89-04, "Guidance On Developing Acceptable Inservice Testing Programs," dated April 3, 1989.

Results (Units 1 and 2):

- Plant Operations

  An unresolved item was identified that involved control room personnel not understanding the need to document entry into a technical specification action statements when entered in conjunction with a scheduled surveillance test (Section 2.4.2.1.).

- Maintenance

  Not applicable during this inspection.

- Engineering

  The number of discrepancies identified in the inspectors' sample audit of the inservice test plans was a weakness of the inservice test program (Section 2.1).

  A design bases document was being established for all components, which will allow plant staff to clearly understand the reasons that components are either in the inservice testing program or not (Section 2.1).

  The licensee had established adequate measures to assure that design changes would receive an appropriate evaluation to identify any impact on other programs (Section 2.1).

  The licensee had structured the inservice testing program test requirements to satisfy the testing/alternate testing positions specified in Generic Letter 89-04 (Section 2.2).

  An unresolved item was identified that involved a potential unauthorized signature on a post-maintenance test on a containment spray valve (Section 2.3.3).

- Plant Support

  The ongoing procedure enhancement project is a major step in the right direction because the licensee had identified a number of deficiencies associated with surveillance test procedures (Section 2.1).

  A violation was identified that involved the failure to perform inservice testing on reactor makeup water pumps (Section 2.3.1).

  The quality assurance audit of the inservice test program was weak in that it did not evaluate implementation of the NRC positions contained in Generic Letter 89-04 (Section 2.3.2).

  A weakness was identified regarding the licensee's difficulty in readily retrieving inservice test data and the applicable test procedures (Section 2.4).

Inspection Findings:

- Inspection Followup Item 498;499/9419-05 was opened (Section 2.1).
- Inspection Followup Item 498;499/9419-02 was opened (Section 2.1.3).
- Violation 498;499/9419-03 was opened (Section 2.3.1).
- Unresolved Item 498;499/9419-01 was opened (Section 2.3.3).

- Inspection Followup Item 498;499/9419-04 was opened (Section 2.3.4).
- Unresolved Item 498;499/9419-06 was opened (Section 2.4.2.1).
- Inspection Followup Item 498;499/9419-07 was opened (Section 2.4.3.1).

Attachments:

- Attachment 1 - Persons Contacted and Exit Meeting
- Attachment 2 - Documents Reviewed

DETAILS

1 PLANT STATUS

During this inspection period, Unit 1 was in Mode 1 full-power operation and Unit 2 transitioned from Mode 2 to Mode 1.

2 INSERVICE TESTING (IST) OF PUMPS AND VALVES (73756)

The objectives of this inspection were to ascertain whether the licensee's IST program was: (a) consistent with the positions, criteria, and guidelines provided in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs"; and (b) in conformance with the requirements of Subsections IWP and IWV of Section XI of the ASME Boiler and Pressure Vessel Code, 1983 Edition through the Summer 1983 Addenda.

2.1 Review of IST Program for Pumps and Valves

The inspectors reviewed the licensee's program for pumps and valves which consisted of a pump and valve IST plan for each unit, a station procedure for pumps, a station procedure for valves, a plant surveillance program, and numerous plant surveillance procedures. The current pump and valve IST plans in effect for Unit 1 and Unit 2 were Revisions 5 and 3, respectively. They were identical and provided a description of the pump and valve testing plans. Each plan contained a pump list and a valve list which identified the pumps and valves contained in the IST program, the applicable ASME code class, test parameters to be measured, test intervals, applicable relief requests, and piping and instrumentation drawing grid coordinates. Station Procedures OPGP03-ZE-0021, "Inservice Testing Program For Valves," Revision 6, and OPGP03-ZE-0022, "Inservice Testing Program For Pumps," Revision 7, established general requirements for the performance of IST. The station procedures also defined responsibilities, test requirements, test performance, data review and trending, and test procedure preparation. The specific details regarding performance, scheduling, and evaluation of IST pump and valve tests were addressed in Procedure OPGP03-ZE-0004, "Plant Surveillance Program," Revision 13.

The licensee submitted Revisions 5 and 3 of the IST plans to the NRC on September 14, and December 26, 1990, respectively. The NRC completed it's review and notified the licensee by letter dated March 19, 1992, that because no changes to previously approved relief requests were submitted, other than the addition of certain valves which did not invalidate the bases for granting relief, all of the relief requests were acceptable for implementation. The letter also stated that during the review, it was noted that cold shutdown justifications had not been included for accumulator discharge isolation valves and the accumulator vent valves that had been added to the IST plans. Further, the letter stated that the IST plan discussions regarding cold shutdown test requirements differed from those in the ASME Code. Therefore, the licensee was instructed to submit a relief request regarding inclusion of its cold shutdown position into the IST plans. During a telephone call on

January 14, 1992, the licensee informed the NRC that cold shutdown justifications for the accumulator valves had been included in later revisions to the IST plans, and that a relief request would be submitted for review and approval. Subsequently, the licensee submitted relief requests to the NRC by letter dated May 7, 1992, including two (one for each unit) dealing with inclusion of its cold shutdown position into the IST program. The NRC responded by letter dated January 19, 1993, stating that recent rulemaking covered the relief requested by the licensee; therefore, relief was no longer required. The letter also stated that while NRC approval of the cold shutdown justification was not required, it should be submitted with the next periodic update of the IST program.

During the week of May 16, 1994, the inspectors reviewed Revisions 6 and 4 of the IST plans for Units 1 and 2, respectively (Note: These revisions had not been issued or implemented at the time of this inspection). Both revisions were submitted to the NRC for review on June 30, 1993. Revision 6 was submitted in Transmittal Letter ST-AE-4498 and Revision 4 was submitted in Transmittal Letter ST-HL-AE-4499. The inspectors noted that cold shutdown justification had not been included. Licensee personnel informed the inspectors that a supplement, which was supposed to include the cold shutdown justification, had been prepared, but not yet submitted. The inspectors' review of that document determined that the cold shutdown justification was not addressed. Further discussion with licensee personnel resulted in the supplement being revised to include cold shutdown justifications for the accumulator vent valves and accumulator discharge isolation valves. The revised supplement was reviewed and approved by the plant operations review committee in PORC Meeting No. 94-057 on June 2, 1994.

During a review of the licensee's Updated Final Safety Analysis Report (UFSAR), IST plans, and an unnamed data base which listed valve identifications, system identifications, and applicable IST surveillance procedures, the inspectors identified the following discrepancies. The IST plan valve list for each unit identified the two inboard and two outboard reactor head vents (four per unit) as having the prefix FV (i.e., FV-3657A, FV-3657B, FV-3658A, and FV-3658B), while the unnamed data base showed the same valves identified with the prefix HV. In addition, the IST plan valve list for each unit showed the size of the four feedwater isolation valve bypass valves to be 3 inches, while the UFSAR showed the same valves to be 2 inches. In response to the inspectors observations for each of these two cases, licensee personnel determined that the IST plans were incorrect. Corrections were made by noting change descriptions in the revised supplement to each of the IST plans, discussed above.

During discussions with licensee personnel, the inspectors characterized each of these issues as being relatively unimportant; however, when taken collectively, symptomatic of some underlying condition such as inattention to detail. The number of discrepancies identified in the IST plans is considered a weakness of the IST program.

NRC draft NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," published November 1993, recommended that each licensee create a bases document for its IST program. Bases documents typically have included a description of the methodology used for preparing the IST program, the basis for including or excluding pumps or valves in the IST program, and the testing applied to each component. A bases document would allow plant staff to understand the reasons that the components are either in the program or not in the program. The document would also be useful for reviews performed under 10 CFR 50.59 when changes to the plant are made.

The inspectors discussed this with licensee personnel to determine their position regarding the creation of a bases document. The manager of engineering programs provided the inspectors with a copy of Office Memorandum, "Justification of Inservice Test Plan Bases Document Funding," dated May 9, 1994, which was sent to the vice president of nuclear engineering. The memorandum recommended funding to develop an IST plan bases document. The inspectors considered the recommendation to be appropriate; however, decisions regarding development, funding, and implementation of the identified tasks had not been made at the time of this inspection.

The NRC review of a bases document (if the licensee develops such document) is an inspection followup item (498;499/9419-05).

2.1.1 Design Process

The inspectors reviewed Procedure OPGP03-ZE-0031, "Design Change Implementation," Revision 9, dated July 17, 1992, to determine whether IST requirements were included as an item for design engineers to consider when modifying plant systems. It was noted from this review that the procedure contained Form OPGP03-ZE-0031-1, "Design Change Checklist," a four page form which was required to be completed by the cognizant engineer. The form consisted of several sections including: program impact; cognizant engineer's assessment of operations, maintenance, and testing activities impact; and a coordinated review with the cognizant engineers for other impacted systems and areas. The inspectors noted that Item 2 in the program impact section stated, "ASME Section XI Pump And Valve Testing Program (Reference OPGP03-ZE-0021 and OPGP03-ZE-0022)." From a programmatic aspect, the licensee had established adequate measures to assure that design changes would receive an appropriate evaluation to identify any impact on the 20 programs identified in Section 1 of the design change checklist.

The inspectors reviewed two recent examples of evaluations performed by the cognizant engineer of design changes which installed new check valves. Neither example resulted in a change to the program, as the valves were not safety-related or important to safety.

2.1.2 Cold Shutdown Testing Definition

The definition of cold shutdown testing frequency used in the IST program incorporated a provision from ANSI/ASME OM-10, "Inservice Testing of Valves in Light-Water Reactor Power Plants." The provision stipulated that cold shutdown testing will commence within 48 hours and, if not completed when the plant is ready to startup, testing will be permitted to be delayed to the next cold shutdown. This provision was not in the 1983 Edition through the Summer 1983 Addenda in Section XI of the ASME Code, and was identified to the licensee in the NRC letter dated March 19, 1992.

The licensee submitted Relief Requests RR-51 (Unit 1) and RR-46 (Unit 2) by letter dated May 7, 1992, in which relief from the requirements of IWV-3412 and IWV-3522 to exercise valves tested during cold shutdown conditions was requested. The licensee proposed to implement the scheduling of these tests in accordance with the requirements provided in paragraphs 4.2.1.2(g) and 4.3.2.2(g) of OM-10. The NRC responded by letter dated January 19, 1993, that recent rulemaking to 10 CFR 50.55a, effective September 8, 1992, incorporated the 1989 Edition of ASME Section XI. The 1989 Edition provided that the rules for IST of valves are as specified in OM-10. The NRC imposed no limitations to OM-10 associated with testing valves during cold shutdown; thus, the relief requested by the licensee was covered by the rulemaking and relief was no longer required.

2.1.3 Use of Pressure Instruments Outside ASME Section XI Requirements

The inspectors were made aware of the existence of Justification for Continued Operations 94-0003, Revision 1, which was initiated on April 15, 1994. The justification for continued operations related to a deviation from the requirements of Subsection IWP-4120 in Section XI of the ASME Code, which requires the full-scale range of measuring instruments to be three times the reference value or less.

During the surveillance procedure reviews performed as part of the procedure enhancement project, the licensee discovered that the pressure gauges used to measure the suction pressure of the component cooling water pumps (three per unit) had a 160 psig range, which exceeded the suction pressure reference value range of 20 to 23 psig by more than three times. This caused the initiation of Station Problem Report (SPR) 940802, which questioned the operability of the pumps. The reviews and evaluations resulting from the SPR identified that the suction pressure gauges for several pumps (16 pumps from Unit 1 and 17 pumps from Unit 2) and the discharge pressure gauges for 3 pumps from Unit 2 were outside the full-scale range requirements of the ASME Code. The differential pressure of each of the affected pumps was recalculated from the last test data and, after the licensee's analysts applied a conservative tolerance adjustment to the measured suction pressures, all pumps were determined to remain operable. Subsequent testing was planned to be performed using temporary gauges that meet the full-scale range requirements of the ASME Code. Also, an assessment of the continued use of temporary gauges has been initiated.

While the Code specifies that the full range of each instrument shall be three times the reference value or less, it also specifies an accuracy of plus or minus 2 percent of full scale for instruments used to measure pressure for inservice pump tests. The licensee evaluated the actual plus or minus 0.5 percent accuracy of the discharge pressure gauges combined with the larger full-scale range against the maximum combination that would exist in meeting ASME Code requirements and determined that the actual reading was within the Code equivalency. Section 5.5.1 of draft NUREG-1482 states that relief will be granted when the combination of accuracy and full-scale range of installed instruments gives a reading at least equivalent to the reading achieved from instruments that meet the Code requirements. The licensee discussed this with the NRC and was informed that a relief request would be required and relief would be granted in accordance with the guidance contained in NUREG-1482.

With respect to the previously mentioned procedure enhancement project, during early 1993, it became apparent to the licensee that problems existed with the adequacy and consistency of surveillance procedures. At that time, there were 11 groups on site that were writing procedures without the benefit of a procedure writer's guide. A guide was initiated, and the number of groups responsible for writing procedures was reduced. The licensee's representative stated that it was intended for one group to become responsible for writing surveillance procedures. The inspectors were informed that there were currently 1034 surveillance procedures in existence, of which approximately 200 were Section XI pump and valve surveillance procedures, and approximately another 100 were various Section XI and 10 CFR 50, Appendix J, leak rate test procedures.

It was explained to the inspectors that the primary purpose for surveillance procedure enhancement was to take into consideration human performance factors and to establish each procedure as a bases document to verify acceptance criteria and attributes based on technical specifications, UFSAR, and Section XI of the ASME Code. In addition, the format of the procedures was being changed to incorporate the actual performance steps such that all test data, results, and sign-offs will become an integral part of the procedure. The current procedures were essentially structured in two parts: the instructions and steps required to perform the test, and the data package in which the results of tests and signatures were recorded. Once a test was completed and the results approved, the procedural portion was discarded and the data package became the permanent record. The inspectors were provided copies of several draft surveillance procedures to show the new format and improved content.

It was readily apparent to the inspectors that this enhancement project would strengthen the surveillance procedures, not only from a technical standpoint, but for ease of use. Further, from a records standpoint, the integrated procedure would provide a readily retrievable and complete history of each surveillance test performed. The inspectors acknowledged this effort as a major undertaking.

Because the licensee identified problems associated with surveillance test procedures during the ongoing enhancement project, and the fact that significant importance has been attached to the project, the inspectors considered this item to be an inspection followup item (498;499/9419-02).

2.2 Evaluation of Licensee Response to Positions Provided in Generic Letter 89-04

2.2.1 Full-Flow Testing of Check Valves

The licensee's IST plans provided for full-flow testing (full-stroke exercise to the open position) of all check valves in the plans except where the tests were impractical to perform, in which case, relief was to be requested and granted. The full-flow tests met the position of Generic Letter 89-04 because flow is measured directly and is based on UFSAR-specified maximum design-flow rates that the check valves must pass during accident conditions.

2.2.2 Alternative to Full-Flow Testing of Check Valves

For those check valves where it was found to be impractical to full-flow test, relief requests had been submitted in which alternative testing, as described in Generic Letter 89-04, was proposed. The alternative testing consisted of disassembly and inspection, and where possible, partial stroking on a quarterly basis or during cold shutdowns. The relief requests had been approved by the NRC and were a formal part of the IST plans.

2.2.3 Back-Flow Testing of Check Valves

All Category C check valves (valves which are self actuating in response to some system characteristic) were either full-stroke tested, or disassembled and inspected with a partial-stroke test (if possible). Section XI of the ASME Code requires that Category C check valves performing a safety-related function in the closed position to prevent reversed flow be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. In addition, for Category A/C check valves (self-actuating check valves which have a specified leak rate), seat leakage must be limited to a specific maximum amount in the closed position. The inspectors verified that all Category A/C check valves listed in the IST plans required the performance of leak testing, with the exception of the reactor coolant pump standpipe to residual heat removal loops (two check valves for each of three loops for each unit). The licensee submitted a "Clarifications of Valve Testing Methods" that addressed the fact that these valves are normally closed during normal plant operation, and that any leak would be detectable by a high-level alarm on the corresponding reactor coolant pump seal standpipe. Therefore, no additional testing other than normal operations monitoring of the seal standpipe would be performed. This clarification of the test method was accepted by the NRC.

2.2.4 Pressure Isolation Valves

Pressure isolation valves are defined as two normally closed valves in series that isolate the reactor coolant system from an attached low-pressure system. The inspectors reviewed Technical Specification Table 3.4-1 to determine the identity of the pressure isolation valves (a total of 27 per unit), and then verified that they were included in the IST plans as either Category A or Category A/C valves. Technical Specification 3/4.4.6.2.1 required the pressure isolation valves to be demonstrated operable by verifying that leakage limits were acceptable at least once per 18 months, or prior to entering Mode 2 if the plant had been in a cold shutdown condition for 72 hours or more and if leakage testing had not been performed in the previous 9 months. The inspectors verified that the operability surveillance tests had been performed on all of the pressure isolation valves for both units on various dates during January, February, and March 1994, using the following procedures: 1PSP03-SI-0023, "SIS Pressure Isolation Check Valve Leak Test," Revision 4; 2PSP03-SI-0021, "Safety Injection System Valve Operability Test (Refueling)," Revision 1; 1 and 2PSP03-RH-0010, "RHR System Valve Leak Tests," Revision 2; and 1 and 2PSP03-RG-0007, "Residual Heat Removal System Valve Operability Test (Cold Shutdown)," Revisions 5 and 2, respectively.

2.2.5 Limiting Values of Full-Stroke Times for Power-Operated Valves

The purpose of the limiting value of full-stroke time was to establish a value for taking corrective action on a degraded valve before the valve reached the point where there was a high probability of failure to perform its safety function if called upon. The generic letter guideline stipulated that the limiting value of full-stroke time should be based on the valve reference or average stroke time of a valve when it was known to be in good condition and operating properly. The guideline also stated that when the technical specification or safety analysis limit for a valve was less than the value established using the above criterion, the technical specification or safety analysis limit should be used as the limiting value of full-stroke time. Conversely, if the technical specification or safety analysis limit for a valve was greater than the value established using the above criterion, then the limiting value should be based on the above criterion rather than the technical specification or safety analysis limit.

The licensee's representative indicated that baseline values had been established using the lower value of either the technical specification or safety analysis limits or a value based on the preoperational stroke times obtained during initial startup testing.

The inspectors compared the limiting values of 116 power-operated containment isolation valves listed in Table 16.1.1 of the UFSAR to those listed in the IST program. It was determined for 73 valves that the limiting values listed in the IST program were less than those listed in the UFSAR, while 43 were the same. This demonstrated that the licensee had followed the above guidelines during establishment of limiting values of full-stroke times.

2.2.6 Stroke Time Measurements for Rapid-Acting Valves

The ASME Code specifies, for power operated valves having stroke times of 10 seconds or less, that test frequencies be increased and mandatory corrective actions be taken if stroke times increase by 50 percent or more from the previous test. The generic letter recognized that many plants have power-operated valves that are capable of stroking in 2 seconds or less (rapid-acting valves), such as small solenoid-operated valves. This created much difficulty in applying the ASME Code 50 percent increase of stroke time corrective action requirements for these valves. It was found, for valves with stroke times in this range, that much of the difference in stroke times from test to test came from inconsistencies in the operator or timing device used to gather the data. As a result, the generic letter provided an acceptable alternative to the ASME Code requirements provided the licensee assigned a maximum limiting value of full-stroke time of two seconds to these valves and, upon any valve exceeding this limit, declare the valve inoperable and take corrective action in accordance with the ASME Code.

The licensee submitted requests for relief to exempt rapid-acting valves from the above ASME Code requirements based on these valves being full-stroke tested and timed to the nearest second on a quarterly basis. The requests for relief were accepted by the NRC and were incorporated into the IST program. Acceptance of the test is based on the stroke-time limit (not to exceed 2 seconds).

2.3 Licensee-Identified Deficiencies Associated with the IST Program

2.3.1 Deficiency Report 90-021

During a quality assurance department review and comparison of the active components contained in the UFSAR with those in the IST plans, it was identified that certain components in the UFSAR were not listed in the IST plans. This resulted in the initiation of Deficiency Report 90-021 on May 31, 1990. At that time, Revisions 5 and 3 of the IST plans were in effect. Quality assurance noted that some components were classified as active in the UFSAR, but were not included in either revision of the IST plans. The inspectors were informed that this was due to differences in definition of "active components" between the UFSAR and the ASME Code. The UFSAR defined active components as those that were relied upon to perform a safety function during a transient or event considered in the respective operating condition categories. The operating condition categories were normal conditions, upset conditions, emergency conditions, faulted conditions, and testing conditions.

The ASME Code provides the rules and requirements for IST programs to assess operational readiness of certain valves that are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident. Article IWV-2100 of the ASME

Code defines an active valve as a valve that is required to change position to accomplish a specific function. The licensee indicated that based on its UFSAR definition, the valves were active for all conditions of design and included certain components that did not meet the requirements for inclusion into the IST plans.

As part of the evaluation of the deficiency report, the licensee identified all remaining components that had been excluded from the IST plans. The components were identified in Office Memorandum ST-HS-HS-13946, dated December 14, 1990, and are listed in Attachment 2 to this inspection report. The memorandum also recommended that specific corrective actions be implemented to test the components. The scope of the corrective actions was later revised in Office Memorandum ST-HS-HS-17958, dated January 15, 1992. Both memoranda recommended, in part, that procedures be developed to determine baseline data for components and that missing components be added to the IST plans.

With the exception of those components evaluated by the licensee as being not required in the program, the remaining components identified in Office Memorandum ST-HS-HS-13946 were added to Revisions 6 and 4 of the IST plans. However, the inspectors noted that one type of component added to the IST plans had not been tested. Specifically, surveillance test procedures for the reactor makeup water pumps had not been developed and the pumps had not been tested as of the date of this inspection. The pumps (two per unit) are classified as ASME Code Class 3 pumps and are considered important to safety. The licensee's representative stated that the procedure(s) would be developed and the test(s) performed within 90 days of the issuance of Supplement 1 to Revisions 6 and 4 of the IST plans.

The inspectors, however, informed the licensee representative that while this issue had been licensee identified in May 1990, that as of June 1994, surveillance test procedures had not been initiated and the pumps had not been tested. The inspectors considered this issue to be a violation of Criterion XVI of Appendix B to 10 CFR 50, in that the licensee had failed to promptly correct an identified program deficiency (498;499/9419-03).

The inspectors inquired how the surveillance requirements for the components added to the IST plans were being tracked to ensure that the components were being tested. The licensee representative stated that the components had been added to the surveillance database and they were being electronically tracked and highlighted by a surveillance test code. The code acted as a "flag" that electronically revealed when the test was due. The inspectors verified, by sampling components added to Revisions 6 and 4, that this method was working and no other cases of failure to test were identified.

2.3.2 Quality Assurance Audit Report 94-02 (TE)

The inspectors reviewed Quality Assurance Audit Report 94-02 (TE), dated March 31, 1994, which included in its scope, a review of the IST program. The purpose of the audit was to verify the programmatic adequacy and assess the

effectiveness of testing activities of eight testing programs and technical specification line items. The audit focused on technical specification-required surveillance testing activities as well as non-technical specification activities.

The audit concluded that the testing programs were effective in ensuring that safety related systems, components, and equipment, operated and responded as designed, and within the technical specification operating limits.

With respect to the IST program, the audit consisted of records verification and actual observation of testing activities. Auditors sampled IST requirements to ensure compliance with the ASME Code and the IST plans. A few of the IST elements sampled included stroke-time testing, valve position indication, pump performance testing, and pump trending data. Auditors also verified that the IST plans specified leak rate testing requirements for Category A check valves. The auditors also observed IST stroke-time testing of valves which had previously been on increased frequency testing.

The quality assurance audit concluded that the IST program for pumps and valves was being satisfactorily implemented and conducted as required by Technical Specification 4.0.5. The audit also concluded that the engineering staff had made an effort to remove pumps and valves from increased frequency testing by performing corrective actions and evaluations of component performance.

The inspectors noted that the audit did not address the licensee's implementation of the positions contained in Generic Letter 89-04. This was a significant oversight because the generic letter discussed deficiencies that could potentially affect plant safety. Attachment 1 of the generic letter described these deficiencies and certain alternative testing methods to ASME Code Section XI requirements that are considered acceptable by the NRC. The inspectors verified that the licensee used some of the alternative testing methods to demonstrate compliance with the ASME Code. Additionally, the generic letter stated, in part, "NRC may conduct inspections to determine licensee conformance with the provisions of the approval granted by this letter . . . areas covered in Attachment 1 will be the focus of future IST inspection." Although the generic letter indicated that Attachment 1 would be the focus of the NRC inspection, the licensee's quality assurance audit did not independently assess the implementation of the generic letter.

While the inspectors did not perform an evaluation of the licensee's quality assurance audit program, the fact that this audit did not evaluate the impact of the generic letter on the IST program, particularly after being advised that the NRC would inspect this area, is considered a weakness.

2.3.3 Station Problem Report 940067

During a review on January 11, 1994, of Work Package CS-1-313180, the licensee reviewer discovered that Step 13 of Post-Maintenance Test Matrix 4.23 indicated the satisfactory completion of a local leak rate test (LLRT) for a containment spray pump discharge isolation valve, when in fact, the test had not been performed. This resulted in the initiation of SPR 940067 dated January 11, 1994. The test was subsequently satisfactorily performed on January 14, 1994.

The licensee's investigation revealed that Step 13 was signed by an ITI MOVATS foreman. The foreman based his decision to sign the step on the following:

- Page 1 of the work order indicated the satisfactory completion of post-maintenance testing, and

- The LLRT coordinator had signed the work package signifying that an LLRT was required. The foreman misunderstood this to mean that the LLRT had been successfully performed.

The foreman thought that these two conditions allowed him to sign the LLRT step as being complete. The foreman indicated that he was given a copy of the matrix to read while on night shift and that he had received no formal training in determining Post-Maintenance Test Matrix 4.23 or motor-operated valve test requirements. Although the foreman said that he had read the test matrix, he did not know when an LLRT was required nor did he know the means to identify an LLRT requirement. Additionally, the licensee's investigation determined that other MOVATS personnel believed that they had not been given adequate training to determine LLRT test requirements.

As part of the corrective action, the licensee representative indicated that all MOVATS personnel would be provided training on post-maintenance test requirements. The inspectors conducted a cursory comparison of an organization chart of MOVATS personnel and the attendance sheet of the personnel who signed that they had attended the training sessions on February 17 and 18, 1994. It appeared to the inspectors that not all identified personnel had attended the training sessions even though the SPR was closed on March 8, 1994. The licensee representative located an attendance sheet from an additional training session that was provided at the end of February 1994. The inspectors were also provided with documentation which showed that two of the employees were no longer employed at the site.

Licensee management questioned the LLRT coordinator to determine if he had given permission to conduct the test because the work package showed that the LLRT coordinator had been contacted by telephone on December 22, 1993. The LLRT coordinator stated that he was not contacted on December 22, 1993, nor had he indicated to anyone that an LLRT for the valve was required. The LLRT coordinator further stated that he was on vacation during that time.

The signature of the individual that signed the work package as having talked to the LLRT coordinator was illegible and could not be determined by the licensee representatives during the inspection. The inspectors learned that the licensee had not conducted an investigation to determine (1) who had signed the work package for the LLRT coordinator, (2) if the individual who signed was qualified to make such a determination, and (3) if any procedures had been violated. These questions were posed to the licensee representative, who, in response, initiated SPR 941165 on May 26, 1994, to investigate these issues.

Because these questions may result in the identification of a procedural violation, the inspectors considered this issue to be an unresolved item (498;499/9419-01) pending the licensee's completion of the SPR 941165 investigation.

2.3.4 Incomplete Corrective Actions

During the licensee's self-assessment of the recent Unit 2 startup, additional discrepancies were identified in the IST program. As a result, a number of corrective actions were proposed. Some of the corrective actions had been completed, but others remained open. The most significant of the remaining actions were: submitting the Unit 1 and Unit 2 IST plan supplements to the NRC; ensuring that (a) commitments made to the NRC and (b) engineering program's responses to NRC correspondence are included in the Unit 2 self-assessment; revising the IST plans for pumps and valves to ensure that future submittals of relief requests are separate from new revisions of the IST plans (because only relief requests require NRC approval); and generating a licensing commitment tracking system to ensure followup on NRC correspondence when a response to NRC is required. These issues will be considered an inspection followup item (498;499/9419-04) because the identified corrective actions were incomplete.

2.4 Review of IST Records

The inspectors reviewed a sample of the piping and instrumentation diagram drawings and surveillance test procedures (identified in Attachment 2 to this inspection report) of both units for the auxiliary feedwater system, safety injection system, residual heat removal system, containment spray system, and the main steam system to determine if required components were included in the IST program. The IST records were reviewed for selected components in each system. These records included pump and valve surveillance test procedures, surveillance test results, calibration of test instruments, test data trending, test summary sheets, and control room logs.

The inspectors considered the administrative management and retrieval of test records to be cumbersome. The vaulting of IST surveillance test records appeared to be controlled by surveillance test number which was assigned each time a surveillance test procedure was performed. A surveillance procedure often contained numerous components, all of which may not have been tested at any time the procedure was performed. Therefore, to review the test history

of a specific component, each surveillance test data package had to be retrieved and reviewed. This greatly increased the time needed to review test data for individual components. Further, the surveillance test procedures were not filed with the surveillance test data packages. While current revisions to surveillance test procedures were readily available, earlier revisions had to be retrieved from the archives.

The inspectors considered the licensee's inability to readily retrieve IST test data and the applicable surveillance test procedures to be a weakness.

2.4.1 Auxiliary Feedwater System

The IST program encompassed a total of 23 valves and 4 pumps of the auxiliary feedwater system for each unit. The NRC approved three Unit 1 relief requests and five Unit 2 relief requests that were applicable to the auxiliary feedwater pumps and valves. The bases for the requests for relief were reviewed and appeared adequate.

2.4.1.1 Review of Test Results

Quarterly IST data for Unit 1 Auxiliary Feedwater Pump 14 and Auto-Recirculation Valve AF0011 from April 21, 1988, to May 19, 1994, were reviewed. These tests were performed using Surveillance Test Procedure 1PSP03-AF-0007, "Auxiliary Feedwater Pump 14 Inservice Test," Revisions 3 through 8. The procedure provided reference values, alert ranges, and required action ranges for the pump, and acceptance criteria for the valve's flow rate and recirculation flow rate. The inspectors noted that Relief Request 7 (quarterly measurement of vibration velocity) was being used in lieu of annually measuring inboard and outboard bearing temperatures.

The inspectors noted that during October 1991, the pump had been placed in an alert range as a result of the differential pressure exceeding the maximum acceptance range criterion. The increased frequency testing continued until September 1992, when it was discovered that the excessive differential pressure was due to running the turbine at a speed greater than the reference value for turbine rpm (i.e., 3602 rpm). The inspectors were aware that during the NRC's operational safety team inspection conducted at South Texas Project on November 30, 1992, through January 12, 1993, numerous pumps and valves had been identified as being in the increased frequency testing requirement. Section XI of the Code requires that such equipment be tested on an increased frequency basis until the cause of the condition is identified and corrected. Of specific concern was the fact that certain equipment had been on increased frequency testing for several years and that the licensee had taken little or no action to correct the conditions that caused the equipment to be placed on increased frequency testing. Further, the number of components being tested on an increased frequency was a contributor to control room operator burden.

Subsequently, the licensee took the necessary steps to correct the conditions which required the equipment to be placed in the Alert Range. The inspectors were provided with a database dated May 17, 1994, that contained the increased frequency testing histories of all components that had ever been placed in the Alert Range. The database showed, that at the time of this inspection, there were no components on an increased frequency testing.

2.4.2 Safety Injection System

The IST program encompassed 68 valves and 6 pumps of the safety injection system per unit. There were four relief requests associated with the pumps and nine relief requests associated with the valves.

2.4.2.1 Review of Test Results

The inspectors reviewed IST test data for four valves and one pump from each unit. These included: Valve XSI-0005A, High Head Safety Injection Pump 2A discharge check valve (containment isolation); Valve XSI-0007A, High Head Safety Injection Pump 2A cold leg outboard check valve (pressure isolation); Valve XSI-0009A, High Head Safety Injection Pump 2A hot leg outboard check valve (pressure isolation); Valve MOV-0039A, safety injection accumulator discharge isolation valve; and High Head Safety Injection Pumps 1A and 2A.

The surveillance test records were dated from December 1, 1988, up to the most recently performed tests. The associated test procedures included: 1/2PSP03-SI-0021, "Safety Injection System Valve Operability Test (Refueling)," Revisions 0 and 2; 1/2PSP03-SI-0023, "Safety Injection System Pressure Isolation Check Valve Leak Test," Revisions 0, 2, 3, and 4; OPSP11-ZA-0005, "Local Leak Rate Test," Revisions 3, 4, and 6; 1/2PSP03-SI-0004, "High Head Safety Injection Pump Inservice Test," Revisions 4 and 5; and OPSP03-SP-0009A, "SSPS Actuation Train A Slave Relay Test," Revisions 1, 2, and 3.

The inspectors' review did not identify any conditions where the valves and pumps had not been appropriately tested within the prescribed frequencies.

As mentioned in Section 2.1, the inspectors noted that the safety injection accumulator discharge valves were added to the IST program on December 20, 1990, and the licensee had not submitted a cold shutdown testing justification. The valves were originally on a quarterly stroke test frequency. However, the IST group recognized that it was not prudent to stroke these valves during operations while in Mode 3 and above; therefore, the IST group changed the stroke test frequency from quarterly to a cold shutdown condition. Technical Specification 3.5.1.a requires the accumulator discharge isolation valves to be open and power removed when in Modes 1, 2, or 3, and above 1000 psig. Cold shutdown testing was performed using Procedure 1/2PSP03-SI-0028, Revision 0.

During the preparation of Revisions 6 and 4 to the IST plans (June 1993), the IST coordinator reviewed all of the surveillances associated with these valves and found what appeared to be a quarterly surveillance stroking of the valves as part of a slave relay test conducted by the instrumentation and controls group. The IST coordinator confirmed this with the cognizant instrumentation and controls engineer. Based on this knowledge, it was requested that the valves be moved from the "Cold Shutdown Test" procedure to "Quarterly Test" Procedure 1/2PSP03-SI-0020, Revision 2. Both procedures were revised to reflect the changes and they became effective on January 25, 1994. The Unit 1 plant manager, when made aware of the changes, did not consider this to be a safe practice and requested an engineering review. This was completed on February 20, 1994, and included a 10 CFR 50.59 evaluation and an unreviewed safety question evaluation form. The evaluation concluded that "it is acceptable to test slave relay contacts for the slave relay test of the accumulator discharge isolation valves without having to stroke the valves themselves as is currently done." Subsequent to the evaluation, the applicable slave relay test procedures for each of the three protection system trains were revised (OPSP03-SP-0009A, -0009B, and -0009C, on April 6, 1994, February 28, 1994, and March 26, 1994, respectively). The revisions prohibited stroking of the valves when the reactor was operating in Modes 1, 2, or 3, and above 1000 psig. This revision of the procedures also cleared the way to reestablish the cold shutdown testing designation in the IST plans.

Procedure OPGP03-ZO-0039, "Operations Configuration Management," Revision 5, addressed actions to be taken when a component or system was rendered inoperable. Paragraph 5.5.3 required the initiation of an operability tracking log when a component or system was rendered inoperable except during routine surveillance testing, provided the associated technical specification action statements were met and a control room log book entry was made. Prior to June 1993, the valves had been stroked during the course of slave relay testing while in Modes 1, 2, or 3, and above 1000 psig. The inspectors reviewed a sample of control room logs (primarily from 1991 and 1992) to determine how entry into a technical specification action statement was documented. The inspectors noted a number of entries that showed the commencement and completion of the surveillance test procedures applicable to the slave relay tests. However, in the sample reviewed, with the exception of one Unit 1 entry dated December 18, 1988, there were no references to either technical specification action statements or the rendering of any accumulator discharge isolation valve inoperable. The inspectors recognized that each of the procedures had numerous sections, any one, or all of which might have been performed. It was also possible that the sample provided to the inspectors didn't contain the pages applicable to the actual performance of the slave relay tests that would have caused the accumulator discharge isolation valves to have closed.

While the inspectors did not establish any objective evidence that the valves actually cycled during the slave relay tests, review of procedures, other documentation, and discussions with cognizant personnel confirmed that they had been cycled. Since the sample of control room logs did not provide any

information regarding documentation of valve cycling, the inspectors questioned licensee representatives about this conflicting information. This prompted the licensee to initiate SPR 941193 on June 3, 1994, which stated: "As a part of NRC Inservice Test Program Inspection (IR94-19), selected control room logs from 1991 and 1992 were reviewed. This review was to determine how the closing of the SI Accum. Disch. MOV (performed as part of 1/2PSP03-SP-0009A, B, C - SSPS Actuation Train A, B, C Slave Relay Test) was being documented in the logs. This review has revealed that the specific technical specification action statements associated with closing these valves was not consistently documented in the control room logs as required by Procedure OPGP03-ZO-0039, Operations Configuration Management Step 5.5.3. The requirement to close these valves when power has been locked out has been removed from Procedure OPSP03-SP-0009A, B, and C, with Revision 3, Revision 2, and Revision 3, respectively."

Subsequent to the initiation of the SPR, the inspectors raised an additional concern dealing with the possibility that operations personnel didn't recognize an entry into a technical specification action statement because cycling of the valves was part of a scheduled instrumentation and controls surveillance test (i.e., slave relay test).

These issues concerning safety injection accumulator discharge isolation valves being cycled at the time of slave relay surveillance tests and the possible failure to recognize and document entry into a technical specification action statement constitute an unresolved item (498;499/9419-06).

2.4.3 Containment Spray Pumps

The IST plan encompassed 13 valves and 3 pumps of the containment spray system per unit. There were three NRC-approved relief requests associated with the valves and one relief request associated with the pumps.

2.4.3.1 Review of Test Results

During retrieval of surveillance test records requested by the inspectors, the licensee representative identified a condition in which surveillance credit had been incorrectly taken for the partial performance of Surveillance Test Procedure 1PSP03-CS-0001, "Containment Spray Pump 1A - Inservice Test," Revision 4, on March 15, 1994. All procedure test attributes with the exception of vibration velocity data had been tested, measured, and recorded. The vibration velocity data elements had been marked "N/A." The inspectors were not informed as to the reason(s) for not measuring the vibration velocities. Even though all test attributes were not performed, the IST database showed that the IST surveillance test had been completed.

The licensee staff initiated SPR 941120 on May 22, 1994, to address and evaluate this problem. Limited information was developed and provided to the inspectors prior to the completion of this inspection. The inspectors were informed that the last complete surveillance test had been performed on

January 2, 1994, and because the IST test frequency for this pump was semiannual, no technical specification violation had occurred. However, had this condition gone unnoticed and the March 15, 1994, date remained as the official IST surveillance date, then the likelihood of missing a required surveillance was greatly enhanced. Additional preliminary information indicated that the pump was actually started to mix borated water in the reactor water storage tank for a chemistry sample.

The inspectors informed the licensee that this item was considered an inspection followup item pending completion of its evaluation of the SPR (498;499/9419-07).

The inspectors reviewed the IST test data since the first quarter of 1991 pertaining to Containment Spray Pumps 1A and 2A. The surveillance test procedures used were 1/2PSP03-CS-0001, "Containment Spray Pump - Inservice Test," Revisions 3 and 4 for Pump 1A, and Revisions 1 and 2 for Pump 2A. The inspectors did not identify any anomalies pertaining to the test data or the test frequencies.

2.4.4 Residual Heat Removal System

The IST plan encompassed 45 valves and 3 pumps of the residual heat removal system per unit. There were five relief requests associated with the valves and three relief requests associated with the pumps.

2.4.4.1 Review of Test Data

The inspectors reviewed the IST test data pertaining to Inboard Suction Isolation Valve MOV-0060B for Residual Heat Removal Pumps 2A and 2B for Unit 1 and 2, respectively. These valves serve as pressure isolation valves and undergo leak testing, operability testing, and remote position indicator verification testing. The inspectors reviewed the operability and remote position indicator verification testing, which was performed using Surveillance Test Procedures OPSP03-ZG-0002, "Valve Remote Position Indicator Verification Test," Revision 0, and 1/2PSP03-RH-0007, "Valve Operability Test (Cold Shutdown)," Revision 5 for Unit 1, and Revisions 0 through 2 for Unit 2. The inspectors did not identify any anomalies associated with either the testing methods or the test frequencies.

2.5 Observation of Tests

The inspectors observed the performance of IST on a main steam safety valve and an auxiliary feedwater pump.

2.5.1 Main Steam Safety Valve

Main Steam Safety Valve PSV-7430 on Unit 2, Train C, was tested on May 17, 1994, using Procedure OPSP11-MS-0001, "Main Steam Safety Valve Inservice Test," Revision 4. The test was observed by the inspectors. The test was performed in accordance with the prescribed steps in the procedure, and all test and measuring equipment were appropriately calibrated. There was nothing unusual noted by the inspectors.

2.5.2 Auxiliary Feedwater Pump

The Unit 1 Auxiliary Feedwater Pump No. 14 was tested on May 18, 1994, using Surveillance Procedure 1PSP03-AF-0007, "Auxiliary Feedwater Pump 14 - Inservice Test," Revision 8. The test was observed by the inspectors. The test was performed in accordance with the steps identified in the procedure, and by use of appropriately calibrated test equipment. The test results were within the acceptance limits, and the pump test results were considered acceptable. The inspectors did not observe any anomalies associated with the test.

ATTACHMENT 1

1 PERSONS CONTACTED

1.1 Licensee Personnel

* K. Taplett, Licensing Engineer
* J. Johnson, Supervisor, Quality Assurance
*#R. Harris, Supervisor, Section XI ASME Code
* S. Thomas, Manager, Design Engineering
* M. Ebel, Inservice Test Coordinator
*#S. Head, Senior Consulting Licensing Engineer
* L. Walker, Licensing Engineer
# T. Underwood, Manager, Operations Support
# R. Lovel, Manager, Unit 1 Operations
# M. Meir, Manager, Engineering Programs
# M. Coughlin, Senior Licensing Engineer

1.2 Contract Personnel

R. Gibbs, Sun Technical Services

1.3 NRC Personnel

D. Powers, Chief, Maintenance Branch
W. Johnson, Chief, Reactor Projects Branch A

In addition to the personnel listed above, the inspectors contacted other personnel during this inspection.

*Denotes personnel that attended the telephonic exit meeting on June 10, 1994.
#Denotes personnel that attended the supplemental telephonic exit meeting on July 8, 1994.

2 EXIT MEETING

An exit meeting was conducted by telephone on June 10, 1994, and a supplemental telephone exit was conducted on July 8, 1994, during which the inspectors summarized the scope and findings of this inspection. The licensee did not express a position on the inspection findings documented in this inspection report. The licensee did not identify as proprietary any information provided to, or reviewed by the inspectors.

ATTACHMENT 2

DOCUMENTS REVIEWED

Piping and Instrumentation Drawings:

Containment Spray System - 5N109F05037 No. 1, Revision 17
Component Cooling Water System - 5R209F05017 No. 1, Revision 17
Component Cooling Water System - 5R209F05020 No. 2, Revision 13
Main Steam - 5S109F00016, Revision 19
Chemical and Volume Control System - 5R179F05007 No. 1, Revision 22
Auxiliary Feedwater - 5S149F00024 No. 1, Revision 31
Safety Injection System - 5129F05016 No. 1, Revision 19

List of Pumps in UFSAR Table 3.9.1-1 that were not included in the IST Plans:

Description	Tag Number
Spent Fuel Pool 1, 2	3R211NPA101A, B
Reactor Makeup Water Pump 1, 2	3R271NPA101A, B*
Standby DG Jacket Water Pump	3Q151MAB0134**
	3Q151MAB0234**
	3Q151MAB0334**
Standby DG Lube Oil Pump	3Q151MPC0134**
	3Q151MPC0234**
	3Q151MPC0334**

List of Valves in UFSAR Table 3.9-1.2 that were not in the IST Plans:

CCW Common Header Return	CC0051
CCW Common Header Return	CC0131
CCW Common Header Return	CC0191
CCW Non Essential Header Return	CC0764**
CCW Non Essential Header Return	CC0765**
CCW RCDT Heat Exchanger Return	CC0540
CCW RCDT Heat Exchanger Return	CC0541
CCW Excess Letdown Hx Return	CC0402
CCW Excess Letdown Hx Return	CC0763
CCW RCP Thermal Barrier Supply Valve	CC0346
CCW RCP Thermal Barrier Supply Valve	CC0758
CCW RCP Thermal Barrier Supply Valve	CC0327
CCW RCP Thermal Barrier Supply Valve	CC0759
CCW RCP Thermal Barrier Supply Valve	CC0321
CCW RCP Thermal Barrier Supply Valve	CC0756
CCW RCP Thermal Barrier Supply Valve	CC0363
CCW RCP Thermal Barrier Supply Valve	CC0757
CCW RCP Thermal Barrier Return Valve	FV4620
CCW RCP Thermal Barrier Return Valve	FV4621
CCW RCP Thermal Barrier Return Valve	FV4626
CCW RCP Thermal Barrier Return Valve	FV4627
CCW RCP Thermal Barrier Return Valve	FV4632
CCW RCP Thermal Barrier Return Valve	FV4633
CCW RCP Thermal Barrier Return Valve	FV4638

CCW RCP Thermal Barrier Return Valve	FV4639
ECW Strainer Backwash	EW0403
ECW Strainer Backwash	EW0404
ECW Strainer Backwash	EW0405
ECW Pump Column Vent	EW0370A
ECW Pump Column Vent	EW0370B
ECW Pump Column Vent	EW0370C
RM Pump Discharge	RM0003
RM Pump Discharge	RM0010
RM Recycle Supply to Storage Tank	RM0013
Feedwater Check	FW0062
Feedwater Check	FW0066
Feedwater Check	FW0067
Sample System RHR Sample	FV4458**
Sample System RHR Sample	FV4459**
Sample System RHR Sample	FV4460**
Auxiliary Steam Line Isolation	FV8838A**
Auxiliary Steam Line Isolation	FV8838B**
DG Fuel Oil Return	DO0056
DG Fuel Oil Return	DO0062
DG Fuel Oil Return	DO0068
DG Fuel Oil Return	DO0126
DG Fuel Oil Return	DO0127
DG Fuel Oil Return	DO0128

List of Valves in USFAR Table 3.9-1.2A that were not included in the IST Plans:

CVCS RCP Seal Water Supply	CV0036A
CVCS RCP Seal Water Supply	CV0036B
CVCS RCP Seal Water Supply	CV0036C
CVCS RCP Seal Water Supply	CV0036D
CVCS RCP Seal Water Supply	CV0037A
CVCS RCP Seal Water Supply	CV0037B
CVCS RCP Seal Water Supply	CV0037C
CVCS RCP Seal Water Supply	CV0037D
CVCS Charging Line (Boration) Throttling	HCV0206
CVCS Alternate Boration Path	XCV0639
CVCS RCP Isolation	FV8400A
CVCS RCP Isolation	FV8400B
CVCS Seal Injection Isolation	XCV0671

*Indicates pumps that have been added to the IST program, but have not yet been tested.

**Indicates components that were identified as being active by the UFSAR but evaluations conducted by the licensee showed that they did not have to be included in the IST plans.

All other components have been included in Revisions 6 and 4 of the IST plans.