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

Report No.: 50-400/88-29

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

Docket No.: 50-400 License No.: NPF-63

Facility Name: Shearon Harris Nuclear Power Plant

Inspection Conducted: August 29 - September 2, 1988

Inspector: Albert B. Ruff 10/12/88
Albert B. Ruff, Team Leader Date Signed

Team Members: C. Paulk, Region II Inspector
M. Miller, Region II Inspector
P. Fillion, Region II Inspector

Approved by: T E Conlon 10-18-88
T. E. Conlon, Chief Date Signed
Plant Systems Section
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This special, announced inspection was conducted in the areas of the licensee's conformance to Regulatory Guide (RG) 1.97, Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident. A follow-up of NRC open items and inspection for Bulletin responses.

Results: In general, the licensee has performed the installation and modifications of instruments to comply with Regulatory Guide 1.97. There were exceptions noted in the Safety Evaluation Report (SER) issued on January 21, 1986, and subsequent correspondence with the NRC. Additional items were identified during this inspection which are discussed in the report. The licensee drawing 2166-S-9000, Post Accident Monitoring (PAM) Equipment, is a compilation of the licensee's intent and exceptions in meeting RG 1.97. This drawing is a good tool and provides a single document that shows the licensee's RG 1.97 instrumentation. This drawing needs to be updated. The licensee stated that this would be accomplished.

A weakness was identified in the licensee's program concerning trending and evaluation of as-found out of tolerance reading on instrument calibration (Paragraph 2.c.(2)(a)).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Brown, Senior Specialist, Corporate QA
*W. Edwards, I&C Engineer, Nuclear Engineering Dept.
*E. Evans, I&C Project Engineer, Nuclear Engineering Dept.
*C. Hinnant, Plant General Manager
*A. Howe, Senior Specialist, Regulatory Compliance
*M. Jackson, Electrical/I&C Supervisor
*D. McCarthy, Principal Engineer, Nuclear Engineering Dept.
*C. McKenzie, Principal Engineer, Quality Assurance/Quality Control
*T. Morton, Manager of Maintenance
J. Presson, Specialist, Nuclear Engineering Dept.
K. Russell, On-site Nuclear Safety
*M. Turkal, Senior Specialist, Nuclear Fuel & Licensing Dept.
*R. Van Metre, Manager of Technical Support

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

NRC Resident Inspectors

*W. Bradford, Senior Resident Inspector
*M. Shannon, Resident Inspector

*Attended exit interview

2. Inspection of Licensee's Implementation of Multiplant Action A-17: Instrumentation for Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident (Regulatory Guide 1.97)(25587).

Criterion 13, "Instrumentation and Control", of Appendix A to 10 CFR Part 50 includes a requirement that instrumentation be provided to monitor variables and systems over their anticipated ranges for accident conditions as appropriate to ensure adequate safety. Regulatory Guide 1.97 (RG 1.97) describes a method acceptable to the NRC staff for complying with the Commissions regulations to provide instrumentation to monitor plant variables and systems during and following an accident.

The purpose of this inspection was to verify that the licensee has an instrumentation system for assessing variables and systems during and following an accident, as discussed in RG 1.97. Under accident conditions

it is necessary that the operating personnel have (1) information that permits the operator to take preplanned actions to accomplish a safe plant shutdown; (2) determine whether the reactor trip, Engineered Safety-Feature Systems (ESFS), and manually initiated safety and other systems important to safety are performing their intended functions; and, (3) provide information to operators that will enable them to determine the potential for causing a gross breach of the barriers to radioactive release and to determine if a breach has occurred. It is essential that indicators be provided to the operator if the barriers are being challenged that will allow the release of radioactive materials. For this reason multiple instruments with overlapping ranges may be necessary. The required instrumentation must be capable of surviving the accident environment for the length of time its operability is required. It is desirable components continue to function following seismic events.

As a result, five types of variables have been specified that serve as guides in defining criteria and the selection of accident-monitoring instrumentation. The types are: Type A - Those variables that provide information needed to permit the control room operating personnel to take specified manual actions for which no automatic control is provided and that are required for safety systems to accomplish their functions for design basis accident events. Type B - Those variables that provide information to indicate whether plant safety functions are being accomplished. Type C - Those variables that provide information to indicate the potential for barriers being breached or the actual breach of barriers to fission product release. Type D - Those variables that provide information to indicate operation of individual safety systems and other systems important to safety. Type E - Those variables to be monitored in determining the magnitude of the release of radioactive materials and for continuously assessing such release.

The design and qualification criteria are separated into three separate categories that provide a graded approach to requirements depending on the importance to safety of the measurement of a specific variable. Category 1 provides the most stringent requirements and is intended for key variables. Category 2 provides less stringent requirements and generally applies to instrumentation designated for indicating system operating status. Category 3 is intended to provide requirements that will ensure that high-quality off-the-shelf instrumentation is obtained and applies to backup and diagnostic instrumentation. A key variable is that single accomplishment of a safety function (Types B and C), or the operation of a safety system (Type D), or radioactive material release (Type E). Type A variables are plant specific and depends on the operations that the designer chooses for planned manual actions. Inspection of Categories 1 and 2 equipment was performed as described below.

a. Category 1 Instrumentation

The instrumentation listed in the Category 1 Table, of this section, was examined to verify that the design and qualification criteria of RG 1.97 had been satisfied. The instrumentation was inspected by reviewing drawings, procedures, data sheets, other documentation, and performing walkdowns for visual observation of the installed equipment. The following areas were inspected:

(1) Equipment Qualification - The EQ Master Equipment List and the Q-List were reviewed for confirmation that the licensee had addressed environmental qualification requirements for class 1E equipment.

(2) Redundancy - Walkdowns were performed to verify by visual observation the specified instruments were installed and separation requirements were met. In addition Loop drawings were reviewed, to verify redundancy and channel separation.

(3) Power Sources - Loop drawings were reviewed to verify the instrumentation is energized from a safety-related power source.

(4) Display and Recording - Walkdowns were performed to verify by visual observation that the specified display and recording instruments were installed. Loop drawings were reviewed to verify there was at least one recorder in a redundant channel and two indicators, one per division (channel) for each measured variable.

(5) Range - Walkdowns were performed to verify the actual range of the indicator/recorders was as specified in RG 1.97 or the SER. Review of calibration procedures verified sensitivity and overlapping requirements of RG 1.97 for instruments measuring the same variable.

(6) Interfaces - The loop drawings and Q-List were reviewed to verify that safety-related isolation devices were used when required to isolate the circuits from non-safety systems.

(7) Direct Measurement - Loop drawings were reviewed to verify that the parameters are directly measured by the sensors.

(8) Service, Testing, and Calibration - The maintenance program for performing calibrations and surveillances was reviewed and discussed with the licensee. Calibration and surveillance procedures and the latest data sheets for each instrument were reviewed to verify the instruments have a valid calibration.

CATEGORY 1 TABLE

Variable	Instrument No. (Channel or Train)		Loop and Wiring Drawings
RCS Pressure	PT-402	I	46574, sheet 22
	PT-402	I	46577, sheet 8
	PR-402-1	I	92079, sheet 11
	PT-403	II	2166 B-401, sheet 197
	PT-403	II	
	PR-402	II	
RCS Hot Leg Temperature	TE-413A	I	46574, sheet 23
	TI-413A	I	46574, sheet 24
	TR-413-1A	I	92079, sheet 12
	TE-423A	I	2166 B-401, sheet 183
	TI-423A	I	
	TR-413-2A	I	
	TE-433	I	
	TI-433A	I	
	TR-413-3A	I	
RCS Cold Leg Temperature	TE-410B	II	46574, sheet 21
	T1-410B	II	46575, sheet 18
	TR-410-1B	II	92080, sheet 19
	TE-420B	II	2166 B-401, sheet 184
	TI-420B	II	
	TR-410-2B	II	
	TE-430B	II	
	T1-430B	II	
	TR-410-3B	II	
Containment Water Level Wide Range	LT-7162	A	47236, sheet 40
	LI-7162	A	47241, sheet 44
	LT-7162	B	2166 B-401, sheet 1046
	LI-7162	B	
Containment Pressure	PT-950	I	46574, sheet 12
	PI-950	I	46575, sheet 12
	PR-950-1	I	46576, sheet 13
	PT-951	II	46577, sheet 10
	PI-951	II	2166 B-401, sheet 185
	PR-950-2	II	
	PT-952	III	
	PI-952	III	
	PT-953	IV	
	PI-953	IV	

Variable (cont'd)	Instrument No. (Channel or Train)		Loop and Wiring Drawings
RWST Level	LT-990	I	46574, sheet 16
	LT-990	I	46575, sheet 16
	LR-990-1	I	46576, sheet 18
	LT-991	II	46577, sheet 9
	LI-991	II	2166 B-401, sheet 1045
	LR-990-2	II	
	LT-992	III	
	LT-992	III	
	LT-993	IV	
	LI-993	IV	
Pressurizer Level	LT-459	I	46575, sheet 20
	LI-459	I	46576, sheet 19
	LR-459	I	46580, sheet 20
	LT-460	II	92079, sheet 10
	LI-460	II	2166 B-401, sheets 145 &
	LT-461	III	146
	LI-461	III	
Steam Line Pressure	PT-474	II	46575, sheet 21
	PI-474	II	sheet 23
	PT-484	II	sheet 25
	PI-484	II	46576, sheet 26
	PT-494	II	sheet 28
	PI-494	II	sheet 30
	PT-475	III	46577, sheet 18
	PI-475	III	sheet 20
	PR-475-1	III	sheet 22
	PT-485	III	92080, sheet 18
	PI-485	III	sheet 20
	PR-475-2	III	2166 B-401, sheets 988 &
	PT-495	III	989
	PI-495	III	
	PR-475-3	III	
	PT-476	IV	
	PI-476	IV	
	PI-486	IV	
	PI-486	IV	
	PT-496	IV	
	PI-496	IV	
Auxiliary Feedwater Flow	FT-2050	A	47236, sheet 6
	FI-2050	A	47241, sheet 8
	FT-2050	B	2166 B-401, sheet 1957
	FT-2050	B	
	FT-2050	C	
	FI-2050	C	
	FR-2050		

Variable (cont'd)	Instrument No. (Channel or Train)		Loop and Wiring Drawings
Condensate	LT-9010	A	47236, sheet 3
Storage Tank	LI-9010	A	2166 B-401, sheet 2092
Level	LT-9010	B	
	LI-9010	B	
Containment	LT-7150	A	47236, sheet 27
Spray Additive	LI-7150	A	sheet 39
Tank	LT-7166	B	2166 B-401, sheet 1041
Level	LI-7166	B	

b. Category 2 Instrumentation

The instrumentation listed in the Category 2 Table, of this section, was examined to verify that the design and qualification criteria of RG 1.97 had been satisfied. The instrumentation was inspected by reviewing drawings, procedures, data sheets, other documentation, and performing walkdowns for visual observation of the installed equipment. The following areas were inspected:

(1) Equipment Qualification - The EQ Master Equipment List and the Q-List were reviewed for confirmation that the licensee had addressed environmental qualification requirements for Class 1E equipment.

(2) Power Sources - Loop drawings were reviewed to verify the instrumentation is energized from a high quality or a safety-related power source.

(3) Display and Recording - Walkdowns were performed to verify by visual observation that the specific display and recording instruments were installed. Loop drawings were reviewed to verify there was at least one recorder, where required by RG 1.97, in a redundant channel and two indicators, one per division (channel) for each measure variable.

(4) Range - Walkdowns were performed to verify the actual range of the indicators/recorders was as specified in RG 1.97 or the SER. Review of calibration procedures verified sensitivity and overlapping requirements of RG 1.97 for instruments measuring the same variable.

(5) Interfaces - The loop drawings and Q-List were reviewed to verify that safety-related isolation devices are used when required to isolate the circuits from computer systems (Not safety-related).

(6) Direct Measurement - Loop drawings were reviewed to verify that the parameters are directly measured by the sensors.

(7) Service, Testing, and Calibration - The maintenance program for performing calibrations and surveillances was reviewed and discussed with the licensee. Calibration and surveillance procedures and the latest data sheets for each instrument were reviewed to verify the instruments have a valid calibration.

CATEGORY 2 TABLE

Variable	Instrument No. (Channel or Train)	Loop and Wiring Drawings
Accumulator Tank(s) Level	LT-920	46579, sheet 8
	LI-920	sheet 9
	LT-922	sheet 10
	LI-922	46661, sheet 12
	LT-924	sheet 13
	LI-924	sheet 14
	LT-926	2166 B-401, sheets 452 &
	LI-926	453
	LT-928	
	LI-928	
	LT-930	
	LI-930	
Accumulator Tank Pressure	PT-921	46579, sheet 8
	PI-921	sheet 9
	PT-923	sheet 10
	PI-923	46661, sheet 12
	PT-925	sheet 13
	PI-925	sheet 14
	PT-927	2166 B-401, sheets 452 &
	PI-927	453
	PT-929	
	PI-929	
	PT-931	
	PI-931	
RHR Flow	FT-605A	46580, sheet 33
	FI-605A	92078, sheet 7
	FT-605B	2166 B-401, sheet 334
	FI-605B	

Variable (cont'd)	Instrument No. (Channel or Train)	Loop and Wiring Drawings
RHR Heat Exchanger Outlet Temperature	TE-606A TR-604 TE-606B TR-606	46579, sheet 13 46580, sheet 5 2166 B-401, sheet 334
Containment Water Level Narrow Range	LIT-7160A LI-7160A LIT-7160B LIT-7160B	47236, sheet 39 47241, sheet 29 2166 B-401, sheet 1041
Containment Spray Flow	FT-7122A FT-7122B	47236, sheet 39 47241, sheet 38 2166 B-401, sheets 1041 & 1042
Accumulator Tank(s) Discharge Valve Position	8808A 8808B 8808C	2166 B-401, sheets 411, 412, 413
6.9KV Emergency Bus Voltage	EI 6956A1 EI 6956B1	2166 B-401, sheets 1729 and 1730
Diesel Generator (a) Voltage	EI 6955A EI 6955B	2166 B-401, sheets 1994 and 2013
(b) Field Voltage	EI 6954A EI 695AB	2166 B401, sheets 1994 and 2014
(c) Current	EI 6951A EI 6951B	2166 B401, sheets 1993 and 2014
(d) Field Current	EI 6950A EI 6950B	2166 B401, sheets 1994 and 2014
(c) Power	EI 6957A EI 6957B	2166 B401, sheets 1994 and 2014
Battery Current	EI 6963A1A EI 6963B1B	2166 B401, sheets 1798 and 1799
Battery Voltage	EI 6961A1A EI 6961B1B	216B401, sheets 1798 and 1799

c. Discussion

(1) Open Items Identified in the SER.

The licensee, Carolina Power and Light Company (CP&L), was requested by Generic Letter 82-33 to provide a report to the NRC describing how the PAM instrumentation meets the guidelines of RG 1.97 as applied to emergency response facilities. The licensee's response to RG 1.97 was provided. As the result of a detailed review and a technical evaluation of the submittals, the NRC issued the SER by letter dated January 21, 1986. The evaluation identified a requested exception that the Accumulator Tank Pressure and Level instruments be exempted from the EQ Rule (10 CFR 50.49). This exception was not approved. CP&L letter to NRC of December 10, 1987, requested a deferral on this issue pending further NRC review. This deferral was approved by NRC letter to CP&L dated May 19, 1988.

(2) Comments and Open Items Observed During the Walkdown, and Review of Document and Drawing for RG 1.97 Equipment.

(a) (Open) Deviation 50-400/88-29-03, Evaluating and Trending Out-of-Tolerance Calibration Data. As part of this inspection, calibration data sheets were reviewed to verify instrument and loop calibration. The review was difficult because total loop calibration data was not available as a package for each selected parameter. The method of calibration and data filing, although acceptable, made the loop calibration data review difficult and inconvenient. The licensee's program allows overlap calibration and testing, i.e., the components can be done separately or together. Because of the way the procedures are structured and implemented, i.e., instruments in the loop are calibrated at different times, the data sheets were provided as filed in time sequence instead of a package for each loop.

During the review to verify the calibration of PAM instruments, it was noted that data recordings for "as found" readings were not in the allowable range for some transmitters. For this condition, the calibration procedures require that the Shift Foreman be notified immediately and the I&C Foreman be notified as soon as possible. This was documented in all required instances except for MST-I0004 which did not have the required sign off for notifying the Shift Foreman. (MST-I0004, the calibration procedure for PT-0951, Containment Pressure Transmitter, was performed on August 17, 1987.)

Fifty Maintenance Surveillance Test (MST) calibration procedures were reviewed and 27 had "as found" values outside of the allowable range. Discussions with a Shift Foreman, an I&C Foreman, and a Maintenance Supervisor indicated that no further evaluation was performed when an instrument was found outside the allowable range if it could be adjusted (calibrated) to be within acceptable tolerances.

The licensee is committed in FSAR Section 1.8 to IEEE Standard 338-1977 (Reg. Guide 1.118) and ANSI N18.7 (Reg. Guide 1.33). The IEEE Standard 338-1977 establishes the criteria for periodic testing of 1E systems. The IEEE standard (Section 6.2.2, 6.6.1.5, 6.6.1.9, 6.6.2.9 and 6.6.2.13) states that a program shall be designed to produce objective data for evaluating the performance and availability of the tested systems/components. IEEE Standard and ANSI N18.7 require a Trending Program. ANSI N18.7 [Section 4.1(4)] also states that the testing program should provide trend data and the capability to determine degradation which may not be apparent to a day to day observer. The testing program at SHNPP does not provide trending or evaluating of out of tolerance readings. The basis for the IEEE Standard is to provide a testing program that will contribute to the attainment of desired system operational availability and identify performance that is not within the allowable limits. The above discussion is considered to be an indication of a deviation from an FSAR commitment and is identified as Deviation 50-400/88-29-03, Evaluating and Trending Out-of-Tolerance Calibration Data.

This item was initially discussed as an unresolved item at the exit meeting. However, the licensee was notified at that meeting that the item would be evaluated at the region. By a subsequent telephone call to the Plant Manager on September 7, 1988, the licensee was notified that the item would be upgraded to a deviation.

(b) (Open) URI 50-400/88-29-01, Justification/Exemption Letter on RCS Temperature Elements Concerning Redundancy

The licensee has designated RCS hot leg water temperature (Th) and RCS cold leg water temperature (Tc) as a Type A, Category 1 variable. In addition, RG 1.97 specifies these variables as Type B, Category 1. RG 1.97 specifies that Category 1 variables should be monitored by redundant instrument loops. The Harris plant has one instrument loop per reactor loop for the Th variable. However, the power supply for each loop is the Channel I inverter. Therefore,

the Harris plant does not have redundant instrumentation for Th. The Tc variable has similar instrumentation except that it is powered from the Channel II inverter. The licensee states in his submittal, dated September 6, 1983, that diverse information for Th is provided by the core exit thermocouples (Type C, Category 1), and diverse information for Tc is provided by the steam line pressure (Type A, Category 1). Nevertheless, the lack of redundant power supplies for the Th and Tc variables may constitute a deviation from RG 1.97. Since the licensee's RG 1.97 submittal did not clearly describe the power supplies, this matter was not specifically reviewed by the NRC. In order to resolve the matter, the licensee agreed to make a supplementary RG 1.97 submittal to NRC describing their instrumentation for Th and Tc, diverse measurements instrumentation power supply and any justification they may wish to provide for acceptability of the present design. This item is designated as URI 50-400/88-29-02 pending licensee and NRR action on this item.

(c) (Open) URI 50-400/88-29-02, Update FSAR and Licensee's Drawing for PAM Instruments, and Ensure MCB has Proper Designator for PAM Instrument. A review of the PAM instruments in the FSAR and those listed on Drawing No. 2166-S-9000, Rev. 0, Post Accident Monitoring Equipment, identified several discrepancies. Some PAM items that were listed in the FSAR were not listed on the drawing and some PAM items that were listed in the drawing were not in the FSAR. In addition, Note 1 in the drawing did not provide a complete definition of all variables and the drawing was not annotated to show the instrument indicators that had the common PAM designator on the control panel (the later is considered to be an enhancement for the drawing). The licensee committed to review and revise both of these documents such that the next update of the FSAR (which will be approximately October 1989) will include the changes.

RG 1.97, Rev. 3, requires that "Types A, B, and C instruments designated as Categories 1 and 2 should be specifically identified with a common designation on the control panels so that the operator can easily discern that they are intended for use under accident conditions." During inspection in the Control Room, discrepancies were noted in the distinct labelling of PAM instruments. For example, all Type A, Category 1 variables did not have a common designator (a yellow border trimming the PAM readout indicator) on the control board. Some Type D, Category 2 variables did. Type D PAM instruments are not required by

R.G.1.97 to have this distinct labeling. To add these common designators for Type D instruments is considered to be a licensee's prerogative. The licensee has committed to review the control board designations to ensure that all Type A, B, and C variables of Categories 1 and 2 are properly labeled. The licensee also stated that an evaluation will be performed for those Type D variables that are designated for accident conditions. This is identified as URI 50-400/88-29-02, Update FSAR, PAM Instrument Drawing and MCB PAM Designations.

(d) Control Room Envelope

RG 1.97 states that it provides the minimum number of variables to be monitored by control room operating personnel during and following an accident. This statement could be interpreted to mean that the variable should be monitored in the control room.

The licensee has designated containment hydrogen concentration as a Type A, Category 1 variable. This is not monitored in the control room. The licensee's submittal, dated September 6, 1983, indicates that percent hydrogen concentration is displayed in the control room envelope, processed by the computer and recorded. During the inspection, it was confirmed that percent hydrogen concentration in the containment is displayed on a continuous real time indicator and continuously recorded at the hydrogen analyzer panel. The panel is located in a room adjacent to the main control room that would be readily accessible during and following an accident. The variable is scanned by the plant computer at an appropriate interval and may be displayed on demand on a CRT screen in the main control room. The variable is also recorded by the computer. Based on the above and NRR's acceptance of the licensee submittal, the instrumentation provided (indicators and recorders) to monitor containment hydrogen concentration in the control room envelope is acceptable.

(e) Concerns Identified By a Previous Inspection and/or During Part of the Walkdown Inspection for PAM Equipment

During a routine QA inspection in October 19-23, 1987, unterminated cables were observed in the relay and auxiliary relay panels outside the control room. These unterminated cables were each tagged with a cable identification number which was identical to an installed cable in the same panel. The licensee researched this problem and determined that the unterminated cables were "spared" and should be identified as abandoned or spared cables.

The Site Engineering Unit (SEU) wrote PCR-2444 dated October 26, 1987 and Form 2 dated November 5, 1987, to specify the corrective action for the spared cables. Technical Support issued Form 2XX to close PCR-2444 and initiated work request authorization WRA-87B1MF1. This work ticket was cancelled without the work being accomplished. The inspector was informed that WRAs have been and can be cancelled without the work being accomplished as required. This concern will be addressed by the resident inspectors.

The inspector examined relay cabinet ARP-4B/SB and identified fuses L1-2609 and L5-2640 as the Fault Trap FT 6R type which did not appear to properly fit into the fuse holders. The licensee's engineering personnel could not satisfactorily explain this condition at the time. This concern will be addressed by the resident inspectors.

3. Action On Previous Inspection Findings (92701)

a. (Closed) IFI 50-400/86-42-01, Review Testing Instructions for Periodic Testing of Circuits Covered by Appendix R Coordination Study. In a letter to the NRC, dated August 6, 1986, (Serial: NLS-86-270) CP&L described a program for periodic testing of circuit breakers. The purpose of this program is to demonstrate that the breaker coordination study performed pursuant to NUREG 0800, Section 9.5.1, Fire Protection Program, remains valid; i.e., the breaker time-current characteristics have not significantly drifted. At the time of the fire protection program inspection conducted on June 3-6, 1986, the program for periodic testing of circuit breakers was not yet in place. An Inspector Follow-up Item was established to ensure NRC review of the program. That review was conducted during this inspection (88-29), and the program was found to be acceptable.

In general, ten percent of each type of circuit breaker is tested during each refueling outage. The Planning Section issues a work request for the testing of circuit breakers. A maintenance engineer maintains a list of breakers to be tested and records of testing dates for each. By referring to the master list, a ten percent sample list can be developed for a particular outage. The sample list is attached to the work request and given to the foreman for testing. Testing is performed according to the following procedures, which were reviewed by the inspector:

- Procedure No: MPT-E0023, Revision 0, 480 VAC Power Circuit Breaker (Safe Shutdown) Solid State Trip Unit Test

  This procedure covered long time element pick-up and time delay; instantaneous pick-up; and short-time pick up and time delay.

- Procedure No: MPT - E 0022, Revision 0, General Electric 6.9 KV Overcurrent IFC-53 (Safe Shutdown) Relay Calibration

  This procedure covered pick-up and target test, time delay test and instantaneous pick-up test.

- Procedures No.: MPT - E0024, Revision 0, Molded - Case Circuit Breakers (Safe Shutdown) Test.

  This procedure covered inspection and maintenance, thermal trip test and instantaneous trip test.

  This item is closed.

b. (Closed) URI 50-400/86-62-02, Review the Reportability of all NCR's Involving Electrical Cable Separation. Inspection at the site conducted during the construction phase in the area of electrical separation resulted in an Unresolved Item being identified. Numerous Nonconformance Reports for separation criteria violations had been generated by the licensee. However, at the time of the inspection (July 7-25, 1986), the nonconformances were not being reported pursuant to 50.55(e). The inspector believed the separation criteria nonconformances were reportable because they were discovered after the work was signed-off as being completed and inspected. Subsequent to the inspection, the licensee did report electrical separation criteria nonconformances pursuant to 50.55(e). The final report on the separation issue was transmitted on December 12, 1986, by letter No. HO-860395(o). During this inspection (88-29), the licensee's internal reports to resolve the issue were reviewed. Corrective Action/Noncomformance Report 86-0517 was closed on October 13, 1986.

   This item is closed.

c. (Closed) URI 50-400/86-88-02, Evaluate Reportability of Inadequate Preop Testing of ESF Components. It was established during an inspection conducted on November 17-21, 1986, that inadequate preoperational testing of the sequencer panel constituted a violation. The violation was issued on January 8, 1987. The licensee responded to the violation, and the response has been reviewed and accepted by the NRC. Unresolved Item 86-88-02 was associated with this violation and concerned the reportability of the inadequate preoperational test and a defective sequencer panel. It has been determined by the NRC that the inadequate preoperational test procedures was not reportable under 50.55(e) because it did not constitute a significant breakdown of an entire portion of the quality assurance program itself. The defective sequencer panel was not reportable under Part 21 because the deficiency was already known to the NRC and did not constitute a possible generic problem.

   This item is closed.

d. (Closed) BU-88-03, Inadequate Latch Engagement in HFA Type Latching Relays Manufactured by G.E. IEB 88-03 was issued March 10, 1988, and requested that licensees ensure that all GE latching-type HFA relays installed in Class 1E applications have adequate latch engagement and that those relays which fail to meet acceptance criteria be repaired or replaced. By letter dated June 22, 1988, to NRC, CP&L stated that there were no HFA type latching relays of the series identified in the bulletin in use in safety-related applications at SHNPP. This was also documented in the licensee's response to IEB 84-02, HFA Relays in Class 1E Safety Systems. Based on the above, this item is closed.

4. Exit Interview

The inspection scope and results were summarized on September 2, 1988, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection items and concerns. Proprietary information is not contained in this report.

In the areas inspected, one deviation and two unresolved items *(URI) were identified as indicated below.

* Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations.

Deviation - 50-400/88-29-03, Program Deficient for Trending and Evaluating As-found Out-of-Tolerance Readings During Instrument Calibrations. Paragraph 2.c.(2)a.

URI - 50-400/88-29-01, Licensee to Submit Written Justification on RCS Temperature Elements Concerning Redundancy. Paragraph 2.c(2)b.

URI - 50-400/88-29-02, Update of Licensee's Drawing 2166-S-9000. Paragraph 2.c.(2)c.

5. Acronyms and Initialisms

AUX FW (AFW)	-	Auxiliary Feedwater (System)
BU	-	NRC Bulletin
CRT	-	Cathode Ray Tube
DEV	-	Deviation
DPT	-	Differential Pressure Transmitter
EQ	-	Environmental Qualification
FI	-	Flow Indicator
FT	-	Flow Transmitter
FSAR	-	Final Safety Analysis Report
IFI	-	Inspector Followup Item
LI	-	Level Indicators

LIR	-	Level Indicating Recorder
LR	-	Level Recorder
LT	-	Level Transmitter
MCB	-	Main Control Board
MST	-	Maintenance Surveillance Test
NRR	-	Office Nuclear Reactor Regulation
PAM	-	Post Accident Monitoring
PI	-	Pressure Indicator
PIR	-	Pressure Indicating Recorder
PR	-	Pressure Recorder
PT	-	Pressure Transmitter
RHR	-	Residual Heat Removal (System)
RC	-	Reactor Coolant
RCS	-	Reactor Coolant System
RG	-	Regulator Guide
RWST	-	Refueling Water Storage Tank
SER	-	Safety Evaluation Report
SEU	-	Site Engineering Unit
SHNPP	-	Shearon Harris Nuclear Power Plant
TE	-	Temperature Element
TI	-	Temperature Indicator
TIR	-	Temperature Indicating Recorder
TR	-	Temperature Recorder
TT	-	Temperature Transmitter
URI	-	Unresolved Item