UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report No.: 50-261/95-19

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

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

Facility Name: H. B. Robinson Unit 2

Inspection Conducted: May 14 - June 17, 1995

Lead Inspector: _____ 7-17-95
for W. T. Orders, Senior Resident Inspector Date Signed

Other Inspectors: C. R. Ogle, Resident Inspector
P. J. Fillion, Reactor Inspector
L. W. Garner, Project Engineer

Approved by: _____ 7-17-95
David M. Verrelli, Chief Date Signed
Reactor Projects Branch 1A
Division of Reactor Projects

SUMMARY

SCOPE:

This routine, resident inspection was conducted in the areas of plant operations, maintenance activities, engineering efforts, and plant support functions. The inspection effort included reviews of activities during non-regular work hours on May 14, 17, 21, 23, 30 and June 1, 2, 3, 4, 8, 14, and 17, 1995.

RESULTS:

Plant Operations [Paragraph 3]:

A violation was identified involving multiple examples of configuration control events.

An unresolved item was identified involving racking-in of an SI pump breaker with LTOPP in service.

A second unresolved item was identified involving loose paint in containment.

An improving trend in the material condition of components and structures in the Auxiliary Building was noted.

Maintenance [Paragraph 4]:

A violation was identified involving an inadvertent RHR pump start during maintenance.

A non-cited violation was identified involving personnel not following a FMEA procedure.

Engineering [Paragraph 5]:

A non-cited violation was identified involving the licensee's failure to incorporate load sequencing timer settings into appropriate design documents.

In the main, the licensee's performance in implementing the control room human factors enhancement modification was good. However, the safety evaluation for the modification did not accurately describe the effects of deletion of two non-safety-related annunciator points from the control room. This fact represents a weakness in the design control process.

The failure to identify a potentially intermittent abnormal auxiliary feedwater pump sequencing response during surveillance testing was considered a weakness.

REPORT DETAILS

1. PERSONS CONTACTED

Licensee Employees:

W. Brand, Supervisor, Environmental and Radiation Control
*M. Brown, Manager, Design Engineering
*P. Cafarella, Superintendent, Mechanical Systems
*A. Carley, Manager, Site Communications
*B. Clark, Manager, Maintenance
D. Crook, Licensing/Regulatory Compliance
*A. Garrou, Acting Manager, Licensing/Regulatory Programs
D. Gudger, Senior Specialist, Licensing/Regulatory Programs
*M. Herrel, Manager, Training
*C. Hinnant, Vice President, Robinson Nuclear Project
P. Jenny, Manager, Emergency Preparedness
*K. Jensen, Supervisor, Reactor Systems
*M. Knacszck, Superintendent, Projects
J. Kozyra, Licensing/Regulatory Programs
*R. Krich, Manager, Regulatory Affairs
E. Martin, Manager, Document Services
*B. Meyer, Manager, Operations
*G. Miller, Manager, Robinson Engineering Support Section
*J. Moyer, Manager, Nuclear Assessment Section
*P. Musser, Manager, Plant Operations Assessment
W. Randlett, Manager, Security
B. Steele, Manager, Shift Operations
*R. Stewart, Robinson Engineering Support Section
*W. Stover, Manager, Operations Procedures
D. Taylor, Plant Controller
G. Walters, Manager, Support Training
R. Wardern, Manager, Plant Support Nuclear Assessment Section
W. Whelan, Industrial Health and Safety Representative
*D. Whitehead, Manager, Plant Support Services
T. Wilkerson, Manager, Environmental Control
L. Woods, Manager, Technical Support
*D. Young, Plant General Manager

Other licensee employees contacted included technicians, operators, engineers, mechanics, security force members, and office personnel.

NRC Personnel:

*W. Orders, Senior Resident Inspector
*C. Ogle, Resident Inspector
*P. Fillion, Reactor Inspector
*L. Garner, Project Engineer

*Attended one or more of the three exit interviews conducted for this report necessitated by visiting RII inspectors.

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. PLANT STATUS AND ACTIVITIES

a. Operating Status

The report period began with the unit in day 16 of refueling outage 16. Following the completion of planned outage work, with the unit at normal operating temperature and pressure, an RCS leak was identified on the main flange area of the C reactor coolant pump. This forced a plant cooldown to conduct repairs. Following these repairs, an orderly transition was made through plant fill, heatup, and startup. The unit output breakers were shut on June 21, 1995, day 54 of the outage.

b. Other NRC Inspections and Meetings

P. Fillion, a Region II Reactor Inspector, was on site during the week of May 22 - 26, 1995, to conduct an inspection of modifications to the control room. Results of this inspection are contained in this report.

L. Garner, a Region II Project Engineer, was on site during the week of June 12 - 16, 1995, to conduct an inspection of station modifications and major surveillance testing. Results of this inspection are contained in this report.

3. OPERATIONS

a. Plant Operations (71707)

The inspectors evaluated licensee activities to determine if the facility was being operated safely and in conformance with regulatory requirements. These activities were assessed through direct observation, facility tours, discussions with licensee personnel, as well as, management, evaluation of equipment system status, and review of facility records.

Routine plant tours were conducted to evaluate equipment operability, assess the general condition of plant equipment, and to verify that radiological controls, fire protection controls, physical protection controls, and equipment tagging procedures were properly implemented. During routine inspections of the Auxiliary Building by a Region II inspector, it was noted that the external material condition of plant equipment had improved as compared to that observed approximately two years ago. This observation was based upon fewer components, such as valves, with boron acid buildup due to leaks; leak catch container usage has become infrequent; and equipment and structural coatings (paint) have been improved.

Clearance Procedure Error, Valve SI-883R

On May 26, 1995, the licensee experienced difficulties filling the safety injection accumulators. The licensee determined that valve SI-883R was shut with a clearance tag attached. This valve isolates the accumulator fill header from the SI pump discharge flowpath and is normally open. The tag was removed, the valve was restored to the proper position, and a condition report was generated. The inspectors were informed that the clearance tag hanging on the valve was from a local clearance and test request which had been canceled on May 2, 1995.

The inspectors interviewed the Operations personnel involved in the disposition of the clearance tag found hanging on SI-883R, reviewed all clearances identified as having been on the valve during the current refueling outage, and reviewed licensee procedures: Operations Management Manual Procedures, OMM-005, Clearance and Test Request; OMM-001, Operations - Conduct of Operations; and Plant Program Procedure, PLP-30, Independent Verification.

The inspectors determined that an auxiliary operator and an independent verifier initialled the clearance on May 2, 1995, indicating that the valve was open and the tag removed. Subsequently, a licensed senior reactor operator signed the clearance attesting that all tags listed in the clearance were accounted for. In fact these activities had not been accomplished for valve SI-883R.

The AO and independent verifier stated that on May 2, they entered the CV to both remove and install several clearances and that working copies of the clearances were taken into the CV to accomplish these activities. The AO stated that SI-883R was not repositioned when the clearance tag was removed since other clearance tags were attached to the valve which required that it remain shut and he thought that he denoted that fact on the working copy of the clearance. These individuals also informed the inspectors that upon exiting the CV, the working copies of the clearances and the tags were discarded as potentially contaminated material. Contrary to the requirements of OMM-005, the tags which had been removed were not "called-in" to the clearance center for accountability before they were disposed of. When the AO and independent verifier returned to the work control center, they completed the master copy of the clearance from memory indicating, in part, that SI-883R had been opened and the tag removed.

The inspectors interviewed the SRO who signed the clearance attesting to the fact that all tags and caps associated with it had been accounted for. He stated that he did not recall the specifics of the clearance in question, but speculated that the clearance may have been removed incrementally. He stated that when clearances are removed in this fashion, caps and tags are not

retained until the clearance is completely removed and hence, no final verification of tag accountability is performed. He stated that in this situation, the licensed operator in the clearance center relies on the initials on the clearance as the basis for verification of accountability.

The inspectors concluded that the individuals involved in the restoration of SI-883R failed to comply with the requirements of OMM-005. This is identified as one of six examples which collectively constitute a violation, 50-261/95-19-01: Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

HVH-2 Run With Air Flowpaths Isolated

On May 26, 1995, during a tour of containment, the inspectors noted an abnormal noise coming from containment recirculation fan unit, HVH-2. The unit was running but the inlet damper and intake butterfly valve were both closed. The inspectors notified the control room and the unit was stopped. A condition report was generated to address this issue.

The inspectors interviewed the control room SRO and two SROs assigned to the clearance center at the time, reviewed Local Clearance And Test Request 95-F0476 which was in force on the HVH unit at the time of this observation, and evaluated Operations Management Manual Procedure, OMM-005, Clearance And Test Request.

The inspectors determined that the inlet damper to HVH-2 was failed closed as a result of instrument air supply to the damper activator being isolated by clearance 95-F0476. The clearance did not alter the position of the butterfly valve or its air supply valve. The clearance specified that a CIT be affixed to the RTGB control switch for HVH-2 to alert operators of the clearance. The inspectors were informed that a CIT was not on the switch when the unit was started. From a review of the clearance paperwork, the inspectors noted that no signature or initials were recorded to demonstrate that the CIT had been affixed.

The inspectors concluded that the failure to affix the CIT was contrary to the requirements of OMM-005. This example constitutes one of six examples which collectively comprise Violation 50-261/95-19-01, Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

SI Pump Breaker Racked In With LTOPP In Service

At 5:26 a.m., on the morning of May 30, 1995, the A SI pump motor breaker was racked in to fill the SI accumulators. Approximately one minute later, the RCS vent path to containment was isolated when the pressurizer PORVs were unblocked and shut in preparation for placing LTOPP in service. At 5:31 a.m., this activity was complete and LTOPP was declared in service. This configuration existed until 6:08 a.m., when the SI pump breaker was again racked-out.

Having an SI pump breaker racked in with the RCS not vented appears to be contrary to licensee procedures and TS 3.3.1.3. Pending a review of the licensing basis associated with TS 3.3.1.3 and LTOPP, this will be tracked as an Unresolved Item, URI 50-261/95-19-02, SI Pump Breaker Racked-In With LTOPP In Service.

RHR Pump Operated With No Flow

On June 3, 1995, the licensee was preparing to restart the unit, having completed refueling. Using GP-002, Cold Shutdown To Hot Subcritical At No Load TAVG, control room operators were performing procedure steps to depressurize and cooldown the "A" train of the RHR system after having isolated it from the Reactor Coolant System. This is done by recirculating the RHR train through its associated heat exchanger until it has been cooled down to approximately 150° F. After approximately fifteen minutes in this alignment, the operators noticed that they had not seen the expected temperature decrease in the system. Initially, the control room operators dispatched an AO to increase the amount of component cooling water being supplied to the RHR heat exchanger. The operators still did not see the expected temperature decrease, so they dispatched an AO to check the position of valve RHR-743 which was to have been providing the recirculation flowpath. Recirculation flow through this path is not indicated in the control room. Initially, the AO reported that the valve was open. The control room operators then instructed the AO to verify flow on local indicator FI-608. The AO reported that there was no flow indicated. It was concluded that valve RHR-743 was closed. The AO was instructed to open the valve. After the valve was opened, the control room operators detected an immediate decrease in temperature of the RHR system. By this time, the A RHR pump had been run for approximately 66 minutes with little or no appreciable flow.

Valve RHR-743 had been verified to be open on May 28, 1995, during the performance of Operations Surveillance Test OST-163, Safety Injection Test, and is required to be open as an Initial Condition of GP-002. Ultimately, this mis-configuration resulted in the A RHR pump being declared inoperable. This in turn forced the

licensee to return the unit to cold shutdown to facilitate the disassembly and inspection of the pump.

The misalignment of valve RHR-743 constitutes one of six examples which collectively constitute Violation 50-261/95-19-01, Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

On June 9, 1995, after the A RHR pump had been inspected and reassembled, control room operators were aligning the pump to place it in service. At the time, the B RHR pump was supplying decay heat removal in a configuration which bypassed its heat exchanger. In this configuration, valve HCV-758, the common discharge from both RHR trains' heat exchangers, was closed. The operators started the A RHR pump, and stopped the B pump. They immediately noticed that RHR flow decayed rapidly, restarted the B pump and secured the A pump. Ultimately, the operators determined that valve HCV-758 was closed and the A RHR pump had been started without a flow path. The operators opened cross connect valve, RHR-757C, restarted the A pump and successfully placed it in service. The pump was operated for approximately two minutes with only minimal flow afforded by the fact that valve HCV-758 leaked by.

The inspectors concluded that procedure OP-201 was inadequate in that it did not align the system to facilitate a flow path for the A RHR pump before having the operator start it. This constitutes one of six examples which collectively comprise Violation 50-261/95-19-01, Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

Reduced Inventory Operations

On June 9, 1995, the licensee initiated a draindown of the RCS in accordance with GP-008, Draining The Reactor Coolant System, to facilitate repairs of a leak on the main flange of RCP C. During the repairs, RCS level was reduced to 43 inches below the main vessel flange.

The inspectors reviewed the licensee's preparations for entry into the reduced inventory condition on June 7, 1995. Licensee preparations and precautions for a reduced inventory/mid-loop operations were reviewed by the inspector. No deficiencies were noted during this review. The inspectors witnessed portions of the draindown on June 9, as well as, RCS level stabilization immediately following draindown termination on June 10, 1995. Additionally, the inspectors monitored operator performance during routine control room tours while RCS inventory was below the flange.

The inspectors concluded that appropriate sensitivity to risks associated with operation in reduced inventory was displayed by Operations personnel and the performance of operators during this evolution was good.

AFW Pump Auto Start During Generator Draindown

At 5:33 p.m., on June 14, 1995, both MDAFW pumps started and the SG blowdown isolation valves on all three SGs closed due to a low-low level in steam generator B. This occurred while draining the steam generators in preparation for plant startup. In response to this event, the operators defeated the AFW pump auto-start logic, stopped the MDAFW pumps, and reopened the blowdown isolation valves. AT 6:53 p.m. that day, the licensee made a 4-hour non-emergency report to the NRC in accordance with 10 CFR 50.72 (b)(2)(ii), ESF Actuation. A condition report was generated by the licensee.

In response to this event, the inspectors reviewed Operating Procedure OP-406, Steam Generator Blowdown/Wet Layup System; Administrative Procedure AP-006, Procedure Use And Adherence; log entries associated with the event; and Operations Management Manual Procedure OMM-001, Conduct of Operations; reviewed the auxiliary feedwater pump startup logic diagram, the ERFIS sequence of events printout, the events notification worksheet, and interviewed the AO and SRO involved in the event.

The inspectors determined that the event occurred as a result of a failure by Operations personnel to appropriately block the SG low and low-low level signals from the MDAFW autostart logic circuit during the draindown of the generators. Blocking these inputs is performed by repositioning 4 key switches in the back of the RTGB from the "normal" to "defeat" position.

Draining of the steam generators was performed in accordance with OP-406. This procedure requires that the 4 key switches be taken to the "defeat" position prior to draining the generators. The inspectors noted that although the AO initialed OP-406 as having verified these key switches were positioned to the defeat position, the switches were found in the "normal" position following the event. The AO stated that while performing OP-406, he called the SRO in the control room to request verification that the 4 key switches were in the "defeat" position. Based on the SRO's confirmation, the AO initialed the verification steps in the procedure and continued.

The SRO advised the inspectors that his confirmation of the defeated autostart circuit was based on noting the Train A and Train B AFW Auto Initiation Defeated warning lights on the RTGB were illuminated. This approach was flawed since these warning lights can be illuminated without the 4 key switches specified in OP-406 being in defeat position.

The inspectors concluded that the failure to adequately verify the position of the 4 key switches prior to draining the steam generators was contrary to the requirements of OP-406. This is identified as one of six examples which collectively constitute VIO 50-261/95-19-01, Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

Inadequate Containment Closeout

On June 3 and 4, 1995, the inspectors conducted inspections of containment to verify the adequacy of the licensee's containment closeout. This closeout was conducted in accordance with Plant Program Procedure PLP-006, Containment Vessel Inspection/Closeout. The areas toured by the inspectors included, but were not limited to: all pump bays, the pressurizer cubicle, and the operating deck. Numerous examples of loose tools, equipment and debris were identified by the inspectors and reported to the licensee. Additional cleanup of the CV was conducted by the licensee.

The plant startup was subsequently aborted and the RCS cooled down to conduct repairs to RCP C. After the repairs to RCP C were complete, the licensee commenced an RCS heatup in preparation for reactor plant startup. Following the licensee's completion of PLP-006, the inspectors again conducted a containment inspection to verify the adequacy of the licensee's closeout. While the general cleanliness had improved, the inspectors again found numerous examples of loose equipment and debris. These were again identified to the licensee for disposition.

Due to their size and weight, it is probable that many of the items identified by the inspectors would not have been transported to the ECCS sump during a LOCA. However, given the abundance, the ease of detection, and prior inspector observations of deficient CV closeout, the inspectors concluded that the licensee's efforts at CV closeout were inadequate. This is identified as a weakness in the licensee's containment closeout process.

Throughout the outage and following tours of containment, the inspectors expressed concerns to licensee management regarding loose paint in containment. Primarily, these concerns centered on numerous areas of loose paint on the floor of the first level of the CV, but the inspectors also noted areas of peeling or loose paint on the operating deck, polar crane, and several of the HVH units.

In response to these concerns, the licensee removed some of the loose paint from the floors in containment and the HVH units and provided the inspectors with documentation related to the generic issue of loose paint in containment. This information did not completely resolve the situation at H.B. Robinson. Pending

further review, this issue this is identified as an Unresolved Item 50-261/95-19-03, Loose Paint In Containment.

b. Followup - Operations (92901)

Inadequate Clearance For Work On Valve V1-8A

On April 17, 1995, routine preventive maintenance was to be performed on valve V1-8A, one of three motor-operated valves which supply motive steam to the SDAFW pump. Valve MS-20 which is immediately upstream of V1-8A, was not closed. As a result, the SDAFW pump started when valve V1-8A was opened.

At the end of report period for Inspection Report 95-14, the inspectors had not completed their review of the circumstances associated with this event. Accordingly, this issue was tracked as Unresolved Item, 50-261/95-14-02, Inadequate Clearance For Work On Valve V1-8A.

The inspectors reviewed the clearance, 95-00748, and reviewed Operations Management Procedure OMM-005, Clearance And Test Request. The clearance did not address valve MS-20. At the time of the event, valve MS-20 was open. Accordingly, when valve V1-8A was opened, steam was admitted to the SDAFW pump resulting in an inadvertent start.

Procedure OMM-005, requires in part that all valves necessary to protect personnel and equipment are properly closed or open as necessary.

Clearance LCTR 95-00748 was inadequate in that it did not specify a position for valve MS-20. Ultimately, this resulted in a misconfiguration and inadvertent operation of the SDAFW pump.

It is noted that the planning of this work activity was inadequate in that the maintenance on V1-8A did not adequately address the operability of the SDAFW pump. When V1-8A was opened during the event, and the "SDAFW Pump Low Discharge Pressure Trip" annunciator was received, operations personnel questioned the operability of the pump. Operations personnel appropriately declared the pump inoperable and entered TS 3.4.4. until the operability concern could be resolved.

The operability evaluation was performed by the system engineer. Using the electrical logic and control wiring diagrams, the system engineer concluded that the SDAFW pump would be inoperable if V1-8A were greater than 96 percent open and the SDAFW pump had not started, since valves V1-8B and V1-8C, the other two steam supply valves to the SDAFW pump, would not open upon the receipt of a valid start signal.

Historically, this preventative maintenance had been performed with the unit in cold shutdown, this was the first time it had been attempted with the unit on line. Although this activity had been reviewed by operations and technical support personnel, operability of the SDAFW pump had not been adequately evaluated.

During the event, annunciator APP-007-F5, "SDAFW Pump Low Discharge Pressure Trip," was received. It is believed this alarm may have been received during past performance of this maintenance; however, operability of the pump was not questioned at that time since the plant had been in cold shutdown during the activity.

The technical review of this work activity was inadequate in that the planned activity resulted in the misconfiguration and inoperability of the SDAFW pump.

This issue constitutes one of six examples which collectively comprise Violation 50-261/95-19-01, Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation Unit.

Unresolved Item 50-261/95-14-02, Inadequate Clearance For Work On Valve V1-8A is closed.

4. MAINTENANCE

a. Maintenance Observation (62703)

The inspectors observed safety-related maintenance activities on systems and components to ascertain that these activities were conducted in accordance with TS, approved procedures, and appropriate industry codes and standards. The inspectors determined that these activities did not violate LCOs and that required redundant components were operable. The inspectors verified that required administrative, material, testing, radiological, and fire prevention controls were adhered to. In particular, the inspectors observed/reviewed the following maintenance activities detailed below:

WR/JO 94-AQYY1	Thermal Overload Testing (SI-860B)
WR/JO 95-AGGG1	Troubleshoot Cause Of Instrument Air Compressor Breaker Fire
SP-1329	Flux Thimble Replacement
WR/JO 95-AHDB1	Troubleshoot RHR Pump Fails To Start During OST-163

Upper Internals Installation

On May 22, 1995, the inspectors witnessed the installation of the reactor vessel upper internals which was accomplished in accordance with Maintenance Refueling Procedure MRP-005, Upper

Internals Removal and Installation. Overall, the internals lift and installation were well conducted. However, the inspectors noted that the subsequent lifting rig removal and return to the storage stand were not as well orchestrated. During this phase of the evolution, the inspectors observed the lifting rig impact the manipulator crane, the wall of the refueling cavity, and an electrical cord at the side of the cavity. None of these impacts was particularly severe, but, this performance represented a marked degradation below that observed by the inspectors for the same basic activities only moments before. The inspectors discussed these observations with the refueling coordinator and were subsequently advised that a Condition Report would be initiated to address this event.

FMEA Procedure Not Followed

On May 23, 1995, during a routine tour of containment, the inspectors observed a worker in the reactor vessel head storage area who was not logged into the area on the posted Foreign Material Accountability Log Sheet. When questioned, the individual acknowledged not logging into the area and attributed his failure to not observing the warning sign posted at the entrance to the FMEA area. The individual exited the area and a condition report was generated. The inspectors were advised later that the individual was counselled by licensee management on his actions.

In response to this issue, the inspectors reviewed Plant Programs Procedure PLP-047, Foreign Material Exclusion Area Program. The inspectors also reviewed the condition report generated by the licensee and interviewed the responsible supervisor. From this review, the inspectors noted that PLP-047 established the head storage area as a FMEA. As such, the individual was required to log into the area and abide by other requirements to minimize the potential of foreign material introduction into the reactor vessel head. Overall, the inspectors concluded that the worker's failure to log into the area was a violation of the requirements of PLP-047. This failure constitutes a violation of minor significance and is being treated as a non-cited violation, consistent with Section VII of the NRC Enforcement Policy. This is identified as NCV 50-261/95-19-04, FMEA Procedure Not Followed In Head Storage Area.

Vessel Head Lift

On May 24, 1995, the inspectors witnessed a portion of the reactor vessel head installation accomplished in accordance with Maintenance Refueling Procedure, MRP-004, Reactor Vessel Head Removal and Installation. This observation included head movement from the storage stand to placement on the vessel. The inspectors

also attended the pre-job brief. Overall, the conduct of the evolution was good. Noteworthy strengths included lift team coordination and communications. Strong management involvement was also observed.

Inadvertent RHR Pump Start

On May 29, 1995, the inspectors witnessed portions of troubleshooting performed to determine the cause of the B RHR pump not starting during the performance of Operations Surveillance Test OST-163, Safety Injection Test and Emergency Diesel Generator Auto Start On Loss Of Power And Safety Injection And Emergency Diesel Trips Defeat.

To facilitate troubleshooting, the RHR pump motor breaker was racked to the test position. A defective relay was detected which was removed, and taken to the I & C shop for further troubleshooting. Subsequently, Operations racked-in the pump motor breaker in the event RHR B pump was needed since the normal pump starting circuitry was not affected by the aforementioned relay. A member of the I & C troubleshooting team was informed of the change in breaker position, but failed to advise the other individuals involved in the repair effort.

Subsequently, a new relay was installed and when jumpers were installed to verify its proper operation, the RHR pump motor B started. Control room personnel immediately secured the pump. Ultimately, the B RHR pump was successfully tested during a later part of OST-163.

10 CFR 50, Appendix B, Criterion XIV requires that measures be established for indicating the operating status of structures, systems, and components, to prevent inadvertent operation. The inspectors concluded that the licensee failed to establish adequate measures to prevent the inadvertent start of the RHR pump. This is contrary to the requirements of 10 CFR 50 Appendix B and is identified as a violation, VIO 50-261/95-19-05, RHR Pump Start Due To Troubleshooting.

b. Surveillance Observation (61726)

The inspectors observed certain safety-related surveillance activities on systems and components to ascertain that these activities were conducted in accordance with license requirements. For the surveillance test procedures listed below, the inspectors determined that precautions and LCOs were adhered to, the required administrative approvals and tagouts were obtained prior to test initiation, testing was accomplished by qualified personnel in accordance with an approved test procedure, test instrumentation was properly calibrated, the tests were completed at the required frequency, and that the tests conformed to TS requirements. Upon test completion, the inspectors verified the recorded test data

was complete, accurate, and met TS requirements, test discrepancies were properly documented and rectified, and that the systems were properly returned to service. Specifically, the inspectors witnessed and/or reviewed portions of the following test activities:

OST-163	Safety Injection Test and Emergency Diesel Generator Auto Start On Loss Of Power And Safety Injection And Emergency Diesel Trips Defeat
SP-1246	Reactor Vessel Level Instrumentation (System Calibration)

No violations or deviations were identified.

5. ENGINEERING

Emergency Load Sequencing Timers (92903)

OST-163, Safety Injection Test And Emergency Diesel Generator Auto Start On Loss Of Power And Safety Injection And Emergency Diesel Trips Defeat, revision 24, included verification that emergency loads sequenced onto the emergency buses at the appropriate times. During two partial OST-163 performances on May 28, most of the individual loads sequenced onto the emergency buses approximately 0.1 or 0.2 seconds outside the procedure's acceptance criteria. Subsequent licensee investigation determined that the timing relays had been improperly set earlier in that RFO. The timers were recalibrated and the applicable portion of OST-163 involving the emergency bus load timing sequences was successfully completed on May 29.

The inspectors reviewed the circumstances surrounding the improper timer calibrations. Documents reviewed included: M-1035, Emergency Load Sequencer Relay Replacement, and its field revisions 1 and 4, that installed and initially calibrated the digital timing relays; draft SP-1056, Time Delay Relay Calibration Safeguards Train B, that was written but never issued to calibrate the B train timing relays; Maintenance Procedure Revision/New Procedure Request Form dated August 6, 1993, that requested maintenance write calibration procedures for the timers; PIC-018 (020), Time Delay Relay Calibration Safeguards Train B (A), and their associated document review packages and safety analyses; and completed PIC-018 and 020 performed this RFO. In addition, the inspectors interviewed cognizant maintenance and engineering personnel who were either involved with the development of PIC-018 and 020 or participated in the investigation into the calibration problem. The system engineer who developed the draft SPs and interfaced with maintenance during M-1035 implementation and the

development of PIC-018 and 020 had retired from the company. The inspectors confirmed that the licensee's investigation had identified the contributing causes that resulted in the timers being improperly calibrated during that RFO.

CR No. 95-01379, approved June 7, 1995, documented the causes and proposed corrective actions to address the improper timer calibrations. The primary cause was personnel error that resulted in a failure to ensure design values developed for field Revision 4 to M-1035 were properly transferred to design documents. For example, drawing 5379-3238 was not revised to reflect that the actual timer set points were to be adjusted for the times required for the logic circuits to actuate and close their associated load breakers. A planned corrective action identified in CR 95-01379 was to provide lessons learned from the event to the engineering staff. Also, optimum timer settings were to be established and associated maintenance procedures revised accordingly. The inspectors considered that these actions were appropriate to preclude recurrence of this event.

The failure to incorporate design information into appropriate design documentation such that sequencing timer calibration procedures were established with improper values was a violation of 10 CFR 50, Appendix B, Criterion III. The violation has minimal safety significance, in that, the amount the timers were outside the expected values was not sufficient to adversely affect emergency bus loadings and the unit was never operated with the improper settings. This licensee identified and corrected violation is being treated as a non-cited violation consistent with Section VII of the NRC Enforcement Policy. Thus, this item is identified as NCV 50-261/95-19-06, Failure To Incorporate Sequencing Timer Settings Into Appropriate Design Documents.

During the event review, the inspectors identified that during the second test performed on May 28, the A AFW pump breaker closed approximately 0.8 seconds later than the B AFW pump breaker. Review of the previous three tests (two in 1993) and the subsequent successful test on May 29, revealed that the A AFW pump breaker typically closed within 0.1 seconds of the B AFW pump breaker. Maintenance personnel indicated that they had taken no action to review the occurrence since Operations had not informed them of the abnormal reading. Further review revealed that personnel performing the test and reviewing the test results had failed to identify this discrepancy. Not performing a sufficiently detailed review of OST-163 test data to identify a potentially intermittent condition for additional review or future monitoring was considered a weakness.

During this inspection, the inspectors noted that the calibration frequency for the sequencing timers was every third RFO. Comparison of the as-left timer settings from M-1035 field revision 4 and the as-found values per calibration procedures

PIC-018 and 020 indicated that the timers had drifted a maximum of 0.8% (0.04 seconds) between December 1989 and May 1995. Thus, the inspectors concluded that an every third RFO calibration interval was acceptable.

Electrical Maintenance and Modifications (62705)

During the refueling outage, the licensee implemented modifications to the main control room aimed at improving the layout from the human factors viewpoint. The modification consisted of removing a fairly large control panel, which was greatly under utilized as a result of previous modifications. Removal of the panel created additional space in the central area of the control room. Operator work stations were relocated and upgraded thus achieving improved use of space in the control room.

Plant related non-safety annunciators which had been on the deleted control panel were relocated within the control room, and non-safety 230 Kv breaker status lamps were replaced by ERFIS data points. A number of safety-related cables which had been routed through the deleted control panel were removed and rerouted using new cable. The modification was implemented under Engineering Services Request (ESR) No. 94-882.

Due to extensive wiring changes taking place in a relatively short time period, the NRC inspected the controls that the licensee employed to ensure that the changes were correctly implemented. Requirements relevant to the area of inspection were 10 CFR 50.59, Changes, Tests and Experiments, and 10 CFR 50, Appendix B, Criterion III, Design Control.

The inspection focused on wiring changes. Specific inspection activities and findings were as follows:

* Walkdown inspection of the equipment, raceways and cables in the main control room, relay panels/spreading room and control room roof involved with ESR 94-882. The inspector concluded that the work was done according to the licensee's installation specification, including conduit fill and pulling points, and the quality of workmanship was good.

* In relation to safety-related cables C21732C and C21732D, which were multi-conductor cables selected at random, the inspector verified the following attributes: wires were landed on the correct relay panel terminals, correct size lugs were used, and correct size crimping tool was used. In addition, the inspector verified calibration of the crimping tool.

* The inspector reviewed the completed post-modification test sheets for the modified circuits, and verified that the testing was adequate and results good.

The inspector was told that annunciator points associated with switchyard equipment were deleted from the control room by ESR 94-882. These points were:

* OCB 52-8 [generator breaker] failure detection trouble
* North 230 kV bus breaker failure lockout
* North 230 kV bus differential lockout
* OCB 52-9 [generator breaker] failure detection trouble

It could not be determined during the inspection what the original basis was for having these particular four points in the main control room. The inspector inquired as to whether important information was lost as a result of deletion of these annunciator points. The system engineer assigned to coordinate with the Transmission Department stated that these four points were repeated on an annunciator in the switchyard relay house. He also stated the annunciator points were repeated at the transmission system control center in Raleigh, N. C., and that the dispatcher would notify the nuclear plant control room operator should the annunciator go to alarm condition. The inspector indicated to the licensee that he wanted to verify the annunciators in the switchyard relay house. This activity was scheduled for the following day. The following day the system engineer stated that the two generator breaker failure detection trouble annunciators were not at the annunciator panel in the switchyard relay house and therefore were not repeated at the Raleigh center. Instead, the breaker failure relays were monitored by lamps, which were mounted on the front of the respective breaker control panels. A supervisory lamp is considerably different than an annunciator because an annunciator gives immediate information to system operators whereas a lamp can only give information when operators visit the relay house, which was reported to be about once per month. The inspector went to the relay house and verified the annunciator inscriptions and the breaker failure supervisory lamps.

The safety evaluation for ESR 94-882 indicated the following: "The switchyard annunciator APP-033 alarm lights on the 230 kV Line Panel are removed. Alarms for four of the lights are repeated on an annunciator in the switchyard building. The activity maintains the alarm functions associated with APP-033." The design basis document for ESR 94-882 indicated that: "The annunciator lights [from APP-033] are not required since their functions are repeated elsewhere; therefore, these lights will be deleted from the control room."

The inspector noted that the safety evaluation and the design basis document did not accurately describe the change because, as stated above, two of the annunciators in question were in fact not repeated elsewhere. The fact that these documents were not accurate in this regard was considered significant by the inspector. As far as could be determined through discussions with

licensee personnel, persons preparing the safety evaluation misinterpreted statements made by transmission system engineers as to the design of the annunciators at the relay house. More significantly, apparently no attempt was made to verify the particular description in the safety evaluation. The inspector concluded that the safety evaluation could be revised to support deletion of the two non-safety-related annunciators in question. The fact that the original information was not correct represents a weakness in the sense that, should the licensee continue to allow unverified statements to form the basis for conclusions in their safety evaluations, inadequate safety evaluations could result.

Overall, the inspector concluded that the wiring changes to the main control room performed under ESR 94-882 were well implemented. This conclusion was based on results of walkdown inspections, detailed verification of representative cables, the post-modification test results, and discussions with engineers.

6. EXIT INTERVIEW

The inspectors met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on June 28, 1995. During this meeting, the inspectors summarized the scope and findings of the inspection as they are detailed in this report. The licensee representatives acknowledged the inspector's comments and did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. No dissenting comments from the licensee were received.

Item Number	Status	Description
URI 95-14-02	Closed	Inadequate Clearance For Work On Valve V1-8A.
VIO 95-19-01	Opened	Operations Configuration Control Events Concerning RHR Pump Flow Path, SI-883R, Steam Driven Auxiliary Feedwater, And Containment Ventilation.
URI 95-19-02	Opened	SI Pump Breaker Racked-In With LTOPP In Service.
URI 95-19-03	Opened	Loose Paint In Containment.
NCV 95-19-04	Open/Closed	FMEA Procedure Not Followed In Head Storage Area.
VIO 95-19-05	Opened	RHR Pump Start Due To Troubleshooting.

Item Number	Status	Description
NCV 95-19-06	Opened/Closed	Failure To Incorporate Sequencing Timer Settings Into Appropriate Design Documents.

7. ACRONYMS AND INITIALISMS

AFW	Auxiliary Feedwater
AO	Auxiliary Operator
CFR	Code Of Federal Regulation
CIT	Clearance Information Tag
CR	Control Room, Condition Report
CV	Containment Vessel
ECCS	Emergency Core Cooling System
ERFIS	Emergency Response Facility Information System
ESF	Engineered Safety Feature
FMEA	Foreign Material Exclusion Area
HVH	Heating Ventilation Handling
I&C	Instrumentation And Control
LCO	Limiting Condition for Operation
LOCA	Loss Of Coolant Accident
LTOPP	Low Temperature Over Pressure Protection
MDAFW	Motor Driven Auxiliary Feedwater
OMM	Operations Management Manual
PLP	Plant Program Procedure
PORV	Power Operated Relief Valve
RCP	Reactor Cooling Pump
RCS	Reactor Coolant System
RHR	Residual Heat Removal
SDAFW	Steam Driven Auxiliary Feedwater
SG	Steam Generator
SI	Safety Injection
SRO	Senior Reactor Operator
TS	Technical Specification