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Carolina Power & Light Company

ROBINSON NUCLEAR PROJECT DEPARTMENT
POST OFFICE BOX 790
HARTSVILLE, SOUTH CAROLINA 29550
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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

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H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
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1991 CHANGES TO THE FACILITY REPORT

Gentlemen:

Carolina Power and Light Company (CP&L) provides this report of changes to the facility as described in Amendment 10 to the Updated Final Safety Analysis Report. The enclosure is submitted as specified in 10CFR50.59(b)(2) and contains a brief description of any changes, tests, and experiments, including a summary of the safety evaluation of each. This report provides those changes made operational through August 19, 1991.

Very truly yours,

Ray H. Chambers

R. H. Chambers
General Manager
H. B. Robinson S. E. Plant

RDC:sgk

Enclosure

cc: Mr. S. D. Ebnetter
Mr. L. W. Garner

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Plant Modification No. 990, Feedwater Isolation Indication

DESCRIPTION: A position indication system for the feedwater regulator and bypass control valves was installed. The system consists of open and closed limit switches on the valves and position indication on the RTGB. The system was installed in response to two human engineering deficiencies identified during a Control Room Design Review.

SAFETY EVALUATION SUMMARY: The system installed by this modification is non-safety related with the exception of the electrical power source, which is provided by the vital Train B battery system, and the installation of seismically qualified limit switches on the valves. The system is not required to operate for the valves to perform their designed function. This installation had no impact on the Technical Specifications or the safety margins as defined in their bases. The FSAR was revised to include the additional combustible loading caused by the addition of cables.

Plant Modification No. 994, Control Room Habitability

DESCRIPTION: This modification implemented design changes that were required as a result of evaluation that were performed in accordance with NUREG 0737, Item III.D.3.4. The resulting changes assure that the control room operators are adequately protected against the effects of an accidental release of toxic and radioactive gases and that the nuclear plant can be safely operated or shutdown under design basis accident conditions. The modification consisted of replacing the entire Control Room HVAC system with a modern system meeting the design intent of current standards.

SAFETY EVALUATION SUMMARY: The primary safety functions of the Control Room air conditioning system are Control Room envelope cooling and air cleaning. The modifications to the HVAC system assure that the Control Room operators will not receive a radiological dose exceeding the limits of 10 CFR 50, Appendix A, General Design Criteria 19. The FSAR was revised to reflect this modification. Additionally, a Technical Specification change was submitted to support this modification, and was in place prior to Cycle 14 operations.

Plant Modification No. 998, Service Water Pit Separation

DESCRIPTION: A non-Q seismically supported level switch was installed in the north and south service water pits in order to provide annunciation in the Control Room for high and high-high water levels in the service water pit. This modification was installed in response to recommendations resulting from INPO SOER 85-5 and NRC Information Notice 87-49 related to internal plant flooding. This modification will serve to alert operations personnel of the need to take corrective actions prior to submergence of the service water isolation valve operators to assure acceptable valve configuration to meet the requirements of service water for safe shutdown capability.

SAFETY EVALUATION SUMMARY: This modification did not create any new configuration that would result in any un-analyzed accident. The modification was based on the definition of passive failure as being much less than a full diameter pipe break, and the FSAR was clarified as such. The FSAR was also revised to detail the addition of the annunciation and the level switches, and to reflect the combustible loading additions installed by the modification.

Plant Modification No. 1001, Service Water Pipe Replacement-Containment Penetrations to Service Water Booster Pump.

DESCRIPTION: This modification replaced the Service Water piping from the Containment Building to the Service Water Booster Pumps with that of a material that is more corrosion resistant and less susceptible to microbiological induced corrosion. The piping was routed in the same location as that of the previous piping, and used the existing pipe supports. Design variances from the previous configuration included the addition of throttling valves downstream of the HVH Discharge Isolation Valves, drain valves on each HVH Supply and Return line, removable Venturi's, isolation valves for inspection of the Service Water Check Valves, and instrumentation for HVH performance monitoring.

SAFETY EVALUATION SUMMARY: Upgrading the Service Water piping with that of a material more corrosion resistant improves system reliability and provides a smaller probability of piping failure. The Technical Specifications were not affected by this modification. However, the FSAR was revised to reflect the addition of globe valves, piping material used, and HVH performance monitoring equipment.

Plant Modification 1010, Upgrade of Control Room Emergency Lighting

DESCRIPTION: The Control Room Emergency Lighting system was upgraded as a result of deficiencies identified by a Control Room Design Review. As a part of the modification, new power sources were provided, lighting fixtures were relocated, new battery packs were installed, and new lighting fixtures were installed.

SAFETY EVALUATION SUMMARY: The impact of the addition of electrical loading on the existing AC and DC electrical distribution system was reviewed, as well as the affect of additional electrical penetrations required by the modification. Safety related equipment was seismically installed to allow the equipment to maintain structural and functional integrity following a seismic event. The FSAR is being revised under Amendment 11 to reflect the combustible loading changes implemented by this modification.

Plant Modification 1011, Instrumentation for Mid Loop Operation

DISCUSSION: Non-safety related instrumentation was installed to monitor RCS level and RHR flow and pump discharge pressure. The purpose of this instrumentation is to provide reliable indication of parameters that relate to operation of the RHR system while the RCS is in a reduced inventory condition with irradiated fuel in the reactor vessel. (A reduced inventory condition exists whenever reactor vessel level is lower than three feet below the reactor vessel flange.)

SAFETY EVALUATION SUMMARY: The instrumentation provided for monitoring RCS level is only used while the plant is in shutdown cooling condition and/or while in RCS draindown reduced inventory operations. There is no active interface with normal power operation systems, structures, or components which initiate, mitigate, or effect the ability to deal with an accident. The instrumentation added for monitoring RHR pressure interfaces with the RHR system in the Non-Q portions of the piping. This instrumentation is operable during all modes of operation, and provides indication of RHR Pump performance to Plant Operators in the Control Room. The interface with the RHR system has no effect on the ability of the RHR system to perform its design function. Core exit temperature indication was provided via information available in the ERFIS computer. The core exit thermocouple are safety related; however the input to the ERFIS computer is isolated and was not affected by the modification. The impact of the instrumentation added by this modification is a benefit to the plant and has no negative impact on plant safety. The FSAR was revised to reflect the changes made to the fire loading due to the addition of combustible materials (cable).

Plant Modification 1013, Relocation of Pressurizer Relief Valve Acoustic Monitors

DESCRIPTION: This modification relocated the Pressurizer Relief Valve (PRV) Acoustic Monitor Controller from the Radiation Monitoring Panel in the Main Control Room to a new cabinet in the Cable Spreading Room. In addition, PRV position lights were installed in the Control Room to indicate that a PRV is open as determined by the existing Acoustic Monitor Alarm circuitry and output relays. This modification resolved human engineering deficiencies identified during the Control Room Design Review.

SAFETY EVALUATION SUMMARY: This modification meets the requirements of Regulatory Guide 1.97, and, for a Type D, Category 2 variable, also meets the environmental qualifications of Regulatory Guide 1.89. PRV indication does not require redundancy, continuous display, or seismic qualification. The FSAR was revised to depict the effects of this modification in that the acoustic monitors and preamplifiers no longer transmit signals to an instrument mounted in the Control Room. In addition, the Fire Zone summary was revised to include the additional combustible loading caused by the addition of new cables.

Plant Modification 1014, Relocate Service Water Booster Pump Power Supplies to MCC-16 and MCC-18

DESCRIPTION: This modification relocated the safety-related power supplies for Service Water Booster Pump's (SWBP) "A" and "B" from MCC's 5 and 6 to newly installed safety-related MCC's 16-SA (Safety Train "A") and 18-SB (Safety Train "B"). This modification was necessary to enhance design margin on MCC's 5 and 6 with respect to loading capability. In addition, a train separation concern discovered during the Design Basis Document validation was corrected during this modification. This concern was previously reported to the NRC as LER 90-009, dated July 12, 1990.

SAFETY EVALUATION SUMMARY: This modification did not change the SWBP's control logic, the equipments function, the operating parameters, or the Service Water system's function or performance. Implementation of this modification required terminating and splicing various power and control cables and the installation of additional raceway and cable. The FSAR was revised to reflect the installation of new cable in several fire zones which increased combustible loading/fire severity in those zones.

Plant Modification No. 1016, Electrical Penetration Replacement

DESCRIPTION: Three new electrical penetration assemblies were installed by Modification 1016, and RPS Instrumentation cables for Channels I, II, and III were transferred from six previous penetrations to the three new penetrations.

SAFETY EVALUATION SUMMARY: The addition of three "cartridge " type electrical penetrations in the existing containment nozzles resulted in a change to the design of the facility as described in the FSAR. This change involves a differentiation between the previous capsule design penetration and the new cartridge type, in which only the header is pressurized. The interface with the Penetration Pressurization System with this design was clarified. No changes to the Technical Specifications were required as a result of this modification.

Plant Modification No. 1017, Eliminate RHR Pump Single Failure

DESCRIPTION: This modification implemented design changes to the plant that were required as a result of evaluations performed during the Design Basis Reconstitution of the Safety Injection System. These evaluations identified the need to make improvements in the radiation dose that operators could receive during post-LOCA accident (long term recirculation mode). Specifically, this modification improved system reliability by assuring that a single active or passive failure of any component (i.e., RHR pump seal leak, or Service Water/Component Cooling Water line break) inside the RHR pump pit would not result in system inoperability. New operators were added to the RHR pump suction valves to allow the valves to be operated from low radiation areas during post-accident conditions. New isolation valves were added on the CCW and SW lines to allow a means to isolate leakage from low radiation areas during abnormal plant operations. Also, new safety-related level instrumentation was added to provide a reliable means of detecting possible flooding inside the RHR pit that could occur during and after a seismic event.

SAFETY EVALUATION SUMMARY: Installing this modification enhanced the operability of the plant during post-accident conditions. Therefore, the probability of occurrence of an accident or safety equipment malfunction as defined on chapter 15 of the FSAR were not increased. The margin of safety as defined in the basis of the Technical Specifications was not affected by this change. However, the Technical Specifications were revised to identify valves RHR-752A&B and their breakers in the open position.

Plant Modification 1048, Relocation of Demineralized Water Pump Isolation Valve

DESCRIPTION: This modification relocated the demineralized water pump discharge isolation valve and check valve to ensure a source of demineralized water to Radiation Monitor R-37, and to provide an alternate water source for the Makeup Water Treatment analyzer, the Condensate Polisher Analyzer, and the Degasifier vacuum pump seal water.

SAFETY EVALUATION SUMMARY: The systems affected by this modification are non-safety related. The FSAR was revised to reflect the new valve arrangement on figure 9.2.3-1, Demineralizer Water System Flow Diagram.

Plant Modification 1050, Condensate Storage Tank Level Alarm Setpoint Revision

DESCRIPTION: Plant modification 554 installed redundant CST low level alarm in order to meet a commitment to the NRC. During the review of Modification 1050, it was discovered that the redundant CST alarm was incorrectly installed. This design error was evaluated and was determined to be not safety significant, although the intent of the commitment was not met. Operations personnel are required by procedure to use CST level instrumentation during an event that requires the use of the CST for auxiliary feedwater. The failure of the alarm to operate would not change the actions of the operator would take. Modification 1050 provided new redundant low level alarm setpoints, and a new Lo-Lo level alarm setpoint.

SAFETY EVALUATION SUMMARY: The addition of the redundant low level alarm not only satisfies the NRC requirement for redundant low level alarms that provides at least 20 minutes for operator action, but it will also ensure that there is at least 35,000 gallons of water available to the AFW from the CST, which also satisfies Technical Specification 3.4.1.c requirements. The addition of a 10% alarm provides consistency with operating procedures. The FSAR was revised to reflect the addition of the instrumentation on the flow diagram, and a revised combustible loading due to the cable addition.

Plant Modification 1056, MCC-5 and MCC-6 Load Shedding

DESCRIPTION: In order to ensure that Control Room Habitability load additions and other modifications implemented during the 1990 Refueling Outage could be added without impacting safe operation of the Plant, the Emergency Electrical Power System was assessed with regard to loading requirements. As a result, in order to assure that the Emergency Diesel Generators do not operate beyond their two hour overload rating of 2750 KW, selected non-essential loads were shed from their emergency MCC's upon the initiation of a Safety Injection signal. This removed approximately 50 KW of load from each safety train.

SAFETY EVALUATION SUMMARY: The loads shed from the MCC's consisted of heat tracing circuits used on the Liquid Radwaste System to prevent solidification of the liquid radwaste in the pipes. The Radwaste System is not safety-related, and the impact of pipe solidification during an accident is minimal. The FSAR was revised to reflect the changes in the combustible loading for the fire zones affected by the change.

Plant Modification 1069, Replacement of RTGB MW/MVAR Indicator

DESCRIPTION: The Megawatt and Megavar indication on the main control board are used to monitor the main generator vars and watt. The indication is available during plant operation in order to maintain the MVAR schedule that is specified by system operations.

SAFETY EVALUATION SUMMARY: The MVAR/MW indication circuitry is non safety related, has no control action, and is not required to mitigate any analyzed plant transient. This indication circuitry is not required to be operable during or after an accident. Loss of the indication is compensated by using ERFIS indication, or by contacting the Company Energy Control center, which also monitors the MVAR status of the plant. FSAR Figure 8.3.1-1, Overall Plant Bus System, was revised to reflect the new indicator.

Plant Modification 1101, Installation of Generator Hydrogen Dryer

DESCRIPTION: The Hydrogen Gas Dryer system was replaced with a new, efficient, dual tower dryer. The previous dryer was only designed to remove moisture in the hydrogen. The new dryer not only removes moisture, but also removes oil and dust particles. The new dryer increases the protection of the generator against moisture and also provides a safety factor by monitoring the dew point of the hydrogen gas.

SAFETY EVALUATION SUMMARY: The installation location and the equipment function of the new Hydrogen Gas Dryer Unit is not safety related. The FSAR was revised to reflect the elimination of the Service Water connection required for the previous system.

Engineering Evaluation 90-017, Substitution of Type 316 Stainless Steel for Type 304 Stainless Steel in Piping or Tubing Applications

DESCRIPTION: An Engineering Evaluation justified the acceptability of substituting Type 316 Stainless Steel (S.S.) for Type 304 S.S. in piping or tubing applications. Original design specifications called for 304 S.S. The need for substitution occasionally becomes necessary due to availability of material from suppliers.

SAFETY EVALUATION SUMMARY: This evaluation represents a change to the facility as described in section 5.4.10 of the FSAR. This is the only section of the FSAR that specifies the use of Type 304 austenitic stainless steel for piping versus making general statements allowing the use of any austenitic stainless steel. The evaluation demonstrates that, due to the equivalency of physical properties between 304 and 316 stainless steels, substitution meets or exceeds all design and licensing requirements for safety related applications.

Engineering Evaluation 90-039, Addition of a 1/2 Inch Union in a CVCS Leakoff Line

DESCRIPTION: A 1/2 inch union was added to a low pressure letdown valve in the Chemical and Volume Control System. Since this is a control valve, periodic maintenance requiring disassembly is required to keep the valve operating properly. The addition of a union leakoff line eliminates the necessity to cut out and reweld the line each time the valve is required to be serviced.

SAFETY EVALUATION SUMMARY: The potential safety concern evaluated is the addition of a leak path via the threaded union connection. Leakage would be minimized because the only flow would be past the first set of packing which would be at a low pressure. Section 9.3.4 of the FSAR was revised to reflect the addition of socket welds installed in packing leakoff lines to facilitate valve removal.

Engineering Evaluation 90-093, Expanded Maintenance and Repair of the CCW Heat Exchanger

DESCRIPTION: A special procedure was implemented to conduct expanded maintenance and repair of the A and B Component Cooling Water Heat Exchanger. The procedure provided instructions for the application of a protective epoxy coating on the CCW Heat Exchanger tube sheet and channel heads, re-rolling the heat exchanger tubes, and replacement of the original tubes.

SAFETY EVALUATION SUMMARY: Replacement of the tube material allows for elimination of the plugs in the heat exchanger tubes. Although thermal performance of the new tube material is slightly less than that of the old tubes, elimination of the plugged tubes compensates for the difference. Rolling of the tubes with leaking points enhanced overall heat exchanger reliability. The FSAR was revised to identify the new CCW Heat Exchanger heat transfer capability and material specification.

Engineering Evaluation 90-165, Reactor Coolant Pump Motor Replacement-In-Kind

DESCRIPTION: As a part of planned preventative maintenance activities, the "C" Reactor Coolant Pump motor was replaced. An Engineering Evaluation was conducted to show that the new motor was an acceptable substitute.

SAFETY EVALUATION SUMMARY: The Reactor Coolant Pump motors are non-safety related. Operability of the motors are not credited for mitigating the consequences of an accident or a post-fire safe shutdown. FSAR section 9.5.1A was revised to reflect changes in the motor lubrication oil capacity relative to fire loading.

Safety Analysis for utilization of New Unirradiated Source Assemblies for Cycle 14.

DESCRIPTION: New un-irradiated source assemblies were installed for Cycle 14 in core locations H-03 and H-13. These new assemblies were identical to the old sources except they have eight source rods rather than the usual four. The purpose of doubling the number of source rods was to increase the source strength and to overcome the shielding effect the Part Length Shielded Assemblies have on the source range detector count rate.

SAFETY EVALUATION SUMMARY: A neutronic, transient, and mechanical safety analysis was performed to evaluate the impact of the new source assemblies. The conclusions of the evaluation indicate that the eight-finger sources have an impact on the core, though small and very localized, that is sufficient enough to warrant modeling in the PDQ analytic decks used to infer core power distribution from core flux maps. The transient analysis evaluation concluded that the effect of the eight-finger source assemblies is negligible. The source assemblies are passive equipment which are not involved in either the initiation, prevention, or mitigation of FSAR Chapter 15 accidents. The mechanical analysis concluded that the dimensions and materials in both the four and eight finger source assemblies are the same relative to their interactions with fuel assemblies and fuel handling tools. Therefore, use of the eight finger source assemblies pose no safety concerns. FSAR section 4.2.2.3.2 was revised to describe the new Neutron Source Assemblies.

Inadvertent Boron Dilution Analysis Change

DESCRIPTION: Section 15.4.6-4 of the FSAR was revised to update the Inadvertent Boron Dilution Analysis to reflect the latest work presented in the fuel suppliers Cycle 14 Safety Analysis Report. The acceptance limit and explanation of "Loss of Shutdown Margin" are presented as additional information that is pertinent, useful, and desirable.

SAFETY EVALUATION SUMMARY: Using methods that have been reviewed and approved by the NRC, the latest fuel vendor calculations show an increased margin of safety. The acceptance limit and the explanation of Shutdown Margin are presented to clarify details of the analysis and do not represent a change to the analysis itself.

FSAR Change for Large Break LOCA Analysis

DESCRIPTION: Chapter 15 of the FSAR was updated to reflect the correction of an error in the fuel vendor's calculation of Peak Clad Temperature and percent of Zirc-Water reaction.

SAFETY EVALUATION SUMMARY: The Fuel vendor used NRC approved calculation methods in the error correction rework. The resulting peak clad temperature was higher than before, but the new results still satisfy the 10 CFR 50.46 acceptance criteria and the stipulation of 10 CFR 50, Appendix K. The offsite dose calculation was not affected by this change.

ECCS Evaluation Model Changes

DESCRIPTION: The FSAR was updated to reflect the most recent and accurate information relative to LOCA Peak Clad Temperature issues, penalties, and status.

SAFETY EVALUATION SUMMARY: The FSAR was revised to include the most recent information relative to the appropriate Peak Clad Temperatures for LOCA scenarios. The letter referenced in the change has been submitted to the NRC as a 10 CFR 50.46 required report, specifically identifying issues and changes in the ECCS evaluation models that have an impact on Peak Clad Temperature. As such, the changes to the FSAR are considered administrative.

Clarification of Exceptions Taken to Regulatory Guide 1.137

DESCRIPTION: A change to Section 1.8 of the FSAR was made to clarify CP&L's position on Regulatory Guide 1.137 concerning inclusion of Fuel Oil in the Quality Assurance Program.

SAFETY EVALUATION SUMMARY: The exceptions taken to Regulatory Guide 1.137 were reviewed and approved by the NRC by letter dated December 10, 1981.