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

Report No.: 50-395/90-07

Licensee: South Carolina Electric & Gas Company
Columbia, SC 29218

Docket No.: 50-395 License No.: NPF-12

Facility Name: V. C. Summer

Inspection Conducted: February 26-March 2, 1990

Inspector: R. W. Wright 3/15/90
R. W. Wright Date Signed

Approved by: Frank Jape 3/15/90
F. Jape, Section Chief Date Signed
Quality Performance Section
Operations Branch
Division of Reactor Safety

SUMMARY

Scope:

This routine unannounced inspection was conducted in the areas of design control, design changes and modifications.

Results:

The plant design engineering authority is preparing and implementing design changes and modifications in accordance with their TS, FSAR, 10 CFR 50.59 requirements, and their site approved control procedures. These design changes and modifications appear to be both technically and administratively acceptable. In the areas inspected no violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*O. Bradham, Vice President, Nuclear Opertaions
*R. Campbell, Senior Engineer, ISEG
*R. Clary, Manager, Design Engineering
*H. Donnelly, Senior Engineer, Nuclear Licensing
*J. Fuller, Facilities and Administration
*G. Hall, Associate Manager, Health Physics
*S. Hunt, Manager, Quality Systems
*A. Koon, Manager, Nuclear Licensing
D. Malkmus, Lead Mechanical Engineer, Systems & Performance Engineering
*G. Moffatt, Manager, Maintenance Services
*D. Moore, General Manager, Engineering
*K. Nettles, General Manager, Safety
*C. Price, Manager, Technical Oversight
*J. Skolds, General Manager, Nuclear Plant Operations
K. Steffy, Lead Mechanical Engineer, Design Engineering
*G. Taylor, Manager, Operations
J. Todd, Lead Structural/Civil Engineer, Design Engineering
R. Waselus, Associate Manager, Design Engineering
G. Williams, Lead Mechanical Engineer, Design Engineering
*M. Williams, General Manager Adminstrative & Support Service
S. Zumbrunnen, QC Inspector

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

Other Organizations

H. Gorawski, Foreman, Precision Surveillance Corporation
C. Brooks, QC Supervisor, Precison Surveillance Corporation

NRC Resident Inspectors

*R. Prevatte, Senior Resident Inspector
*L. Modenos, Resident Inspector

Other licensee employees contacted during this inspection included engineers, technicians, and administrative personnel.

*Attended exit interview

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

2. Modification Control Program (37700)

The inspector reviewed the following MRFs to determine the adequacy of the evaluations to meet 10 CFR 50.59 requirements; that appropriate design input considerations were made for seismic, environmental, ALARA and Appendix R requirements; verify that the MRFs were prepared and installed (for those physically inspectable) with design engineering program requirements and applicable industry codes and standards; verify that the MRFs were reviewed and approved in accordance with TS and administrative controls; ensure that applicable plant operating documents (drawings, plant procedures, FSAR, TS, etc.) were revised to reflect the subject modifications; and post modification test requirements were specified and adequate testing was or is scheduled to be performed as necessary.

To accomplish the above objectives the inspector selected four nuclear safety-related MRFs for review. Two were completed during RF04, one was currently underway and one is scheduled for installation during RF05 which is scheduled to begin March 23, 1990.

a. MRF-32130 and MCN-A, and B, Redesign of Chilled Water Subpiping

This MRF corrected a deficiency identified by Nonconformance Notice 2130. Chilled water valves 16365 and 16374 were used for leak testing of chilled water active valves 6410 A,B and 6489A,B. Valves 16365 and 16374 were designed normally closed, safety related valves and met the requirements of ANSI 18.2 safety to non-safety class break isolation.

A previous modification, MRF-10868, added additional pipe to the outlet of 16365 and 16374 and isolation valves to move the test connection to a more accessible location. These new isolation valves added, 6522 and 6523 were classified non-safety related as was the associated piping.

MRF-10868 changed the designation of valve 16365 and 16374 to normally open, consequently isolation of that portion of the chilled water system was now dependent on valves 6522 and 6523 which was not in agreement with ANSI 18.2 design criteria. This modification removed the non-safety related MRF-10868 piping and valves and subsequently redesigned, procured, installed and tested new safety-related (ASME Class 3 Service) piping and valves as a suitable replacement.

MCN-A, and B were written to correct three minor drawing dimensional errors discovered when checking as-built conditions in the field.

The inspector conducted discussions with and queried the lead engineer concerning the redesign, the functional aspects of the subject modification, and the supporting documentation contained in the modification package.

All work was performed by ten MWRs under existing approved procedures. No prerequisite or hold points (in addition to existing procedural hold points) were added. Procedure GTP-304 was used to perform satisfactory VT-2 leak testing of the system. The new safety class piping is seismically supported and routed in an area that does not contain high energy piping. Per this MRF the safety class boundary of the system is physically relocated to the discharge of the new valves 6522 and 6523, but is not changed on a functional basis. The consequences of an accident evaluated in the FSAR will not change since this modification does not affect any plant or operator responses to postulated accidents.

Also the probability of a malfunction of equipment important to safety does not change since active equipment is not affected by this modification.

Nonconformance Notice 2130 received appropriate evaluation for reportablity under 10 CFR 21 requirements and was determined to be not reportable. The inspector verified that required revisions to the FSAR, and essential drawings located in the control room had been completed per the MRF. Necessary procedural revisions and personnel training to these revisions due to this MRF were accomplished.

PSRC Meeting No. 88-48, dated October 28, 1988, documented that the subject MRF was reviewed and approved per Section 6.5 of the TS and Station Administrative Procedure SAP-120.

b. MRF-20884, Installation of New Core Exit Thermocouple Nozzle Assembly Joints (CETNA)

This MRF was for a changeout of the existing core exit thermocouple nozzel assembly joints with a new design which can be assembled/ disassembled in 1/8 of the original time resulting in a substantial savings in a critical path time and radiation exposure.

Combustion Engineering technicians performed the work on all four columns per Vendor Technical Manual IMS-94B-1205 and Work Request No. 20884-001. CE certified the personnel qualifications of their installation and QA personnel selected to perform the work. The field work was performed in two phases. Phase 1 was done with the reactor vessel head on the stand, installing the male flange and make-up clamp on the bottom joint per Appendix A, technical instructions. The bottom joints were successfully hydostatically tested per Appendix B of the subject technical manual. Phase 2 was done with the head reinstalled on the vessel. During this phase the top joint per Section 6 of the technical manual was assembled on all four columns.

As mentioned above, installation verification was performed by CE QA personnel with the exception of leak testing which was conducted by SCE&G QC.

All joints on the four columns were required to have zero visible leakage after repressurizing the reactor coolant system. All unreviewed safety questions were answered "No". The function of the new design is the same as the function of the old design which is to "seal" the CETNA. The design change is a replacement in kind and no previously unanalyzed malfunction could be created by this changeout.

The 10 CFR 50.59 evaluation performed was found adequate. CE issued new as-built drawings depicting the CETNA modification, voiding or superceding prior existing ones.

CE Design Report No. MISC-ME-DR-004, Revision 0, CETNA for V. C. Summer Nuclear Station was verified to have been revised to reflect the subject modification. The MRF did not require any applicable sections at the FSAR, FPER or plant TS to be changed.

PSRC Meeting No. 89-27, dated May 31, 1989, documented in its meeting minutes that the subject MRF was reviewed and approved in accordance with Section 6.5 of the TS and Station Administrative Procedure SAP-120.

c. MRF-21562 and MCN-A, and B, Vertical Tendon Retensioning

This MRF was generated to restress the vertical tendons on the exterior reactor building shell. This restress is necessary due to greater-than-expected relaxation in the tendon wire. Based on available data from the first three surveillances, the reactor building vertical tendons were not anticipated to go below their minimum design values until 1993. This MRF should restore a sufficient force margin over the minimum required TS value for the remainder of the plant life. The work is currently ongoing, being performed by PSC utilizing their procedures and some SCE&G/QC personnel working for a PSC QC supervisor.

Any changes during the course of work which affect design or specification documents by G/C require an MCN for processing. To date the following minor MCNs have been written for the following reasons:

MCN-A — This change notice was generated to include several procedural changes that relate to the tendon retensioning and surveillance work.

MCN-B — Written to accomplish additional procedural changes that increased efficiency and quality of the tendon work.

The restress work is approximately 75 percent complete. The inspector observed the lift-off forces developed and restressing of vertical tendons V-27 and V-29. Their existing lift-off forces of 1214 and 1198 kips respectively exceeded the TS minimum required average tendon force level of 1160 kips which is to be maintained throughout the life of the plant.

Observation of the work in progress; discussions with the lead engineer, PSC foreman, and QC inspectors; and review of the subject tendon stressing records indicates the work is being managed properly and satisfactorily implemented. It appears that most of the vertical tendon restressing will be done while the plant is at power with the possiblity that some work may extend over into RF05 beginning March 23, 1990.

To date only one surveillance tendon has failed to meet the minimal tensile force of 1160 kips and this incident was identified February 6, 1990, as Nonconformance Notice NCN 3674, which was evaluated by design, examined for reportability, and appropriately dispositioned. It was determined by additional testing and design evaluation that the vertical tendon group could still meet the minimum 1160 kip average force. Therefore the TS margin of safety was not affected.

The 10 CFR 50.59 safety analyses appeared adequate. There is no adverse impact for tendon work at power provided the limitations on detensioning of tendons given in the MRF are followed. Likewise, there is no increase in accident potential nor does it decrease the margin of safety of the TS.

The SCE&G Procurement Technical Requirements, PTR-SC-33, Revision 0, Vertical Tendon Retensioning is part of the MRF package since it is nuclear safety related and contains design information for restressing. This PTR was reviewed by the inspector along with the remaining MRF package documentation which included; Appendix R and load change reviews, other discipline interface review responses, technical work records, engineering prerequistes/hold points and the preliminary TS Operability/Return to Service System record. The package was prepared in accordance with approved Engineering Services Procedure ES-416, Design Modification Change Process and Control.

No post modification testing nor revision to the TS is required as a result of this MRF. Discussions with the lead engineer disclosed that Section 3.8 of the FSAR will be revised to briefly discuss the altered initial tendon design created by restressing the vertical tendons.

d. MRF-21309, Replacement of XVG-503, A, B & C - BD Isolation Valves

This modification involves three changes to reduce system start-up transient loadings to an acceptable level, two of which are non-safety related and were not examined by the inspector and the third which involved replacement the above nuclear-safety related valves.

Existing steam generator blowdown isolation valves XVG-503 A, B & C are flexible-wedge gate valves that are susceptible to thermal binding when they are closed for blowdown isolation.

This thermal binding problem requires excessive maintenance time and use of extreme procedures such as heating the valve to reopen it. This MRF replaces the flexible-wedge gate valves with the double-disc (split wedge), parallel seat configuration gate valves which are designed to minimize the occurrence of thermal binding. Also, the MRF recommends the existing air operators be replaced with a more compact design (with enclosed spring) which requires 1/3 less thrust force to operate the double-disc parallel seat configuration gate valves.

The active safety function of the existing valves is to close and isolate the flow from the steam generator and provide containment isolation. The active function of the replacement valves remains unchanged. Thus the probability and consequences of previously evaluated occurrences are not increased.

The revised loadings, due to valve mass change, have been evaluated to assure the existing blowdown system's design stresses are not exceeded in the piping or supports. No new possibilities of an accident or malfunction of equipment important to safety previously evaluated or different from any already evaluated are increased or created respectively.

The modification does not involve or affect an Appendix R related system, nor are electrical system loading changes involved. The engineering instructions to implement installation are clear, the 10 CFR 50.59 assessment is adequate and the post modification testing specified as enhanced by Quality Assurance's Review Comments appears satisfactory.

This modification is scheduled to be installed during RFO-5 beginning March 23, 1990, and upon completion specific FSAR plant changes, training and procedural revisions and as-built drawing revisions have been designated to reflect the MRF. The modification does not effect any portions of the existing systems covered by the TS.

Inspection of the four above mentioned modifications to the review criteria specified resulted in no violations or deviations being identified. The inspector concluded from this sampling of modification packages that the plants design authority is preparing and implementing design modifications in accordance with the sites approved control procedures and these modifications appear to be both technically and administratively acceptable.

3. Exit Interview

The inspection scope and results were summarized on March 2, 1990, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results listed above. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

4. Acronyms and Initialisms

ALARA	As Low as Reasonably Achievable
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
CE	Combustion Engineering
CETNA	Core Exit Thermonuclear Nozzle Assembly
FPER	Fire Protection Evaluation Report
FSAR	Final Safety Analysis Report
G/C	Gilbert/Commonwealth Engineers and Consultants
Kips	1000 Pounds Force
MCN	Modification Change Notice
MRF	Modification Request Form
MWR	Maintenance Work Request
PTR	Procurement Technical Requirements
PSC	Precision Surveillance Corporation
PSRC	Plant Safety Review Committee
QA	Quality Assurance
QC	Quality Control
RFO	Refueling Outage
SCE&G	South Carolina Electric and Gas
TS	Technical Specifications