UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

September 29, 2003

South Carolina Electric & Gas Company
ATTN: Mr. Stephen A. Byrne
Senior Vice President, Nuclear Operations
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P. O. Box 88
Jenkinsville, SC 29065

SUBJECT: V. C. SUMMER NUCLEAR STATION - NRC INSPECTION REPORT 50-395/03-08

Dear Mr. Byrne:

On August 22, 2003, the NRC completed an inspection regarding the application for license renewal for your Summer facility. The enclosed report documents the inspection findings, which were discussed on August 22, 2003, with you and members of your staff in an exit meeting open for public observation at the V. C. Summer Nuclear Training Center.

The purpose of this inspection was an examination of activities that support the application for a renewed license for the Summer facility. The inspection consisted of a selected examination of procedures and representative records, and interviews with personnel regarding the implementation of your aging management programs to support license renewal. For a sample of plant systems, inspectors performed visual examination of accessible portions of the systems to observe any effects of equipment aging.

The inspection concluded that your license renewal activities were conducted as described in your License Renewal Application and that documentation supporting your application is in an auditable and retrievable form. The inspection also concluded that existing aging management programs are functioning well and that when all the programs are implemented as described in your License Renewal Application, there is reasonable assurance that the intended function of vital plant systems, structures, and components will be maintained through the period of extended operation.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this letter, please contact Caudle Julian at 404-562-4603.

Sincerely,

\RA L. Wert Acting For\

Victor M. McCree, Director
Division of Reactor Projects

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

Enclosure: Inspection Report 50-345/03-08

cc w/encl: See page 3

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	50-395
License No:	NPF-12
Report No:	50-395/03-08
Licensee:	South Carolina Electric & Gas Company
Facility:	V. C. Summer Nuclear Station
Location:	P.O. Box 88 Jenkinsville, SC 29065
Dates:	August 4 - 22, 2003
Inspectors:	R. Moore, Senior Reactor Inspector M. Scott, Senior Reactor Inspector K. Van Doorn, Senior Reactor Inspector H. Wang, Operations Engineer, NRR
Approved by:	Caudle Julian Team Leader Division of Reactor Safety

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I

SUMMARY OF FINDINGS

IR 05000395-03-08; 8/4-22/2003; South Carolina Electric & Gas Company; V. C. Summer Nuclear Station; License Renewal Inspection Program, Aging Management Programs.

This inspection of License Renewal (LR) activities was performed by four regional office engineering inspectors, and one staff member from the office of Nuclear Reactor Regulation. The inspection program followed was NRC Manual Chapter 2516 and NRC Inspection Procedure 71002. This inspection did not identify any "findings" as defined in NRC Manual Chapter 0612.

The inspection concluded that LR activities were conducted as described in the License Renewal Application (LRA) and that documentation supporting the application is in an auditable and retrievable form. The inspection also concluded that existing aging management programs are functioning well and that when all the programs are implemented as described in the LRA, there is reasonable assurance that the intended function of vital plant systems, structures, and components will be maintained through the period of extended operation.

The inspectors concluded that there were problems in implementing procedure CMP-700.013 Inspection of Electrical Manholes, in that workers were only inspecting manholes listed in the "scope" statement rather than the complete list in Enclosure 1 of the procedure. This resulted in MH-2, 8, and 9 not being done under this procedure. However MH-2 and 8 were being inspected under a separate preventive maintenance task, but 9 was apparently not being done. The workers thought they had completed data sheets but none could be found. The applicant wrote a CER 03-2507 to correct the problems. Before the end of this inspection the inspectors were shown a draft revision of the procedure intended to clarify which manholes are to be inspected.

The applicant had not yet established tracking items in the plant future task list system to assure implementation of proposed actions to support LR. The lack of an adequate tracking system to assure LR required actions were completed was a general observation concerning all LR actions to be completed and was identified as an item for followup during a future NRC inspection.

Several of the LRA committed aging management programs were new programs yet to be developed at the time of this inspection. NRC will review the applicant's progress on developing these AMPs during a future NRC inspection.

In walking down plant systems and examining plant equipment the inspectors found no significant adverse conditions and it appears plant equipment was being maintained adequately.

Attachment 1 to this report contains a partial list of persons contacted and a list of documents reviewed. The Aging Management Programs selected for review during this inspection are listed in Attachment 2 to this report. Attachment 3 is a list of acronyms used in this report.

Report Details

I. Inspection Scope

This inspection was conducted by NRC Region II inspectors and members of the NRR staff to interview applicant personnel and to examine a sample of documentation which supports the license renewal application (LRA). This inspection reviewed the implementation of the applicant's Aging Management Programs (AMPs). The inspectors reviewed supporting documentation to confirm the accuracy of the LRA conclusions. For a sample of plant systems, inspectors performed visual examination of accessible portions of the systems to observe any effects of equipment aging. Attachment 1 of this report lists the applicant personnel contacted and the documents reviewed. The Aging Management Programs selected for review during this inspection are listed in Attachment 2 to this report. A list of acronyms used in this report is provided in Attachment 3.

II. Findings

A. Visual Observation of Plant Equipment

During this inspection, the inspectors performed walkdown inspections of portions of plant systems, structures, and components (SSCs) to determine their current condition and to attempt to observe aging effects. No significant aging related issues were identified. The following SSCs were observed:

Reactor Building Spray System
Spent Fuel Cooling System
Emergency Feedwater
Condensate System
Component Cooling Water
Feedwater System
Main Steam System
Diesel Generators
Cranes
Ventilation Systems
Spent Fuel Pool
Service Water Pumphouse
Service Water Intake Structure
Electrical Transformer Area
Switchyard

B. Review of Mechanical Aging Management Programs

1. Thermal Fatigue Management Program

The Thermal Fatigue Management Program is an existing program credited in the LRA for confirming that analytical assumptions for cracking due to thermal fatigue remain valid for the period of extended operation. The applicant's program consists of a computer software program contained within the plant computer which provides for a combination of transient cycle counting and Cummulative Usage Factor calculations. The applicant has enhanced the program to project analyses to the 60 year license extension period.

The inspectors reviewed the License Renewal (LR) evaluation, the associated plant procedure, the UFSAR, Technical Specifications (TS), and recent plant data. In addition, the inspectors held discussions with site program owners in this area.

The inspectors concluded that the applicant was conducting adequate reviews for evaluation of thermal fatigue. The applicant had not yet established tracking items in the plant future task list system to assure implementation of proposed actions to support LR. The lack of an adequate tracking system to assure LR required actions were completed was a general observation concerning all LR actions to be completed and was identified as an item for further NRC review. In addition, the inspectors noted that the transient cycles listed in the TS were not consistent with those in the applicant's software program. The applicant's program was consistent with the plant design information, therefore, no significant technical problem was noted. For example; the TS listed 400 reactor trip cycles and the design cycles actually tracked is 230, leak tests greater or equal to 2485 psig are listed in the TS but these are no longer performed and are not counted, and heatup and cooldown temperature ranges are slightly different. The applicant initiated Condition Evaluation Report (CER) 03-2670 to track corrective actions for this problem. When implemented as described, there is reasonable assurance that cracking due to thermal fatique for the Reactor Coolant System (RCS) pressure boundary components and piping will be managed through the period of extended operation.

2. Alloy 600 Management Program

The Alloy 600 Management Program is a compilation of existing programs credited in the LRA as an aging management program for stress corrosion cracking in all Alloy 600 RCS components including the Reactor Vessel Head (RVH), pressurizer, and steam generators. These programs are also credited with management of RCS piping leakage and ongoing inspections associated with a previously identified leak (see NRC Report 50-395/2000-08). The credited programs include chemistry control, the ongoing boric acid corrosion monitoring, and leakage monitoring processes. The applicant plans to maintain involvement in ongoing industry initiatives relative to vessel inspections. The applicant has conducted an RVH inspection and plans to perform another in the next outage. In addition, the applicant plans to enhance the existing program to provide an overall controlling document for the various activities, plans to perform a susceptibility study for Alloy 600 components, and plans to develop Alloy 600 replacement guidelines. The applicant has not identified leaks through the RVH to date.

The inspectors reviewed the applicable LR evaluation, reviewed applicant correspondence, reviewed proposed procedures, reviewed site procedures, reviewed RVH inspection results, and held discussions with applicant personnel responsible for the inspections.

The inspectors noted that the applicant's guidance documents (TR160-120, Attachment II, and LR notebook) were out of date, in that, these referenced two documents which were no longer applicable for the program. These were: procedure HPP-402, Radiological Survey Requirements and Controls for Reactor Building and Incore Pit Entries; and ISE-3, Second 10-Year Interval, Inservice Examination Program. The applicant indicated that this problem would be corrected.

During discussions of inspection plans for the RCS piping, the applicant indicated that Eddy Current Testing (ECT) was not planned for the upcoming outage for nozzle welds on RCS Loops B and C hot legs. The applicant had performed ECT on these welds after a leak was identified and the weld replaced on the Loop A nozzle. These tests had identified indications in both nozzle welds. The inspectors questioned whether ECT inspection should be deleted and

whether NRC NRR personnel were fully aware of inspection plans. The inspectors determined that the applicant's plans were not fully understood by NRC NRR personnel. The applicant indicated that their vendor was in the process of qualifying for the upgraded Ultrasonic Testing (UT) criteria for bimetallic welds and this inspection should be sufficient. The applicant agreed to meet with NRR personnel after the qualification for a full discussion of the proposed testing methodology and justification.

The inspectors concluded that an adequate Alloy 600 Management Program with enhancements is planned, although, as noted for other programs, enhancements were not yet tracked in the applicant's site item data base. When implemented as described, there is reasonable assurance that the intended function of Alloy 600 components will be maintained through the period of extended operation.

3. Reactor Vessel Surveillance Program

The Reactor Vessel (RV) Surveillance Program is an existing program credited in the LRA as an aging management program for managing reactor vessel irradiation embrittlement. The applicant's program consists of periodic testing of RV surveillance capsules and updating of calculations for RV fracture toughness. The applicant plans to perform a one-time analysis of the inlet and outlet nozzles and upper shell course to confirm these will not become controlling during the period of extended license. One of two remaining RV capsules is scheduled to be removed during an upcoming outage and one will be saved for future use. The applicant also imposes temperature/pressure limits on plant operations. The applicant has recently calculated the RV Reference Temperature (RT) for the period of extended operation and confirmed that the RT for the vessel shell and weld material are projected to be less than the 10 CFR 50.61 screening criteria.

The inspectors reviewed the applicable calculations, site procedures, and the Updated Final Safety Analysis Report (UFSAR). In addition, the inspectors held a discussion of the program with responsible applicant personnel.

The inspectors concluded that the Reactor Vessel Surveillance Program was in place, had been implemented, and was consistent with the description detailed in the LRA. Adequate historic reviews to determine aging effects had been conducted, and adequate guidance had been provided to reasonably ensure that aging effects of irradiation embrittlement of the RV will be appropriately managed through the extended license period.

4. Reactor Vessel Internals Inspection

The Reactor Vessel Internals Inspection program is a new program credited in the LRA as an aging management program for cracking, reduction in fracture toughness, loss of pre-load, loss of material, and void swelling for the internals. This program will complement the ongoing inspections performed via the Inservice Inspection (ISI) program. The applicant plans to stay involved with ongoing industry research to further characterize aging mechanisms and implement the necessary inspections.

The inspectors reviewed the applicable LR evaluation and held discussions with responsible personnel. The inspectors concluded that the Reactor Vessel Internals Inspection program is planned and the applicant is appropriately involved with industry initiatives to assure an adequate program in initiated.

5. Steam Generator Management Program

The Steam Generator Management Program, an existing program, is credited in the LRA as an aging management program for the aging effects of stress corrosion cracking and loss of material due to corrosion and wear of steam generator tubes and associated components. The program includes: periodic inspection of tubing and plugs, secondary side integrity inspections, tube integrity assessments, assessment of degradation mechanisms, primary to secondary leakage monitoring, primary and secondary chemistry control, and foreign material exclusion.

The inspectors reviewed the applicable LR evaluation and past inspection results. In addition the inspectors discussed the program with responsible applicant personnel. Note: Steam Generator inspections are the subject of ongoing inspections by NRC.

The inspectors concluded that the Steam Generator Management Program was in place, had been implemented, and included the elements and components identified in the LRA. The generators were replaced in 1994 and only eight tubes had been plugged to date. Adequate historic reviews to determine aging effects had been conducted, and adequate guidance had been provided to reasonably ensure that aging effects will be appropriately managed. When implemented as described, there is reasonable assurance that the intended function of the steam generators will be maintained through the period of extended operation.

6. Inservice Inspection Plan

The ISI program is an existing program credited in the LRA for managing cracking, loss of pre-load, loss of closure integrity, loss of material, and reduction of fracture toughness in several systems which require inspections in accordance with ASME Section XI. The program also covers cracking due to thermal fatigue in the pressurizer surge line.

The inspectors reviewed the applicable LR evaluation, reviewed applicable procedures, reviewed an applicant audit of the program, and conducted a general review of ISI results with responsible applicant personnel. Note: The ISI program is the subject of ongoing inspections by NRC.

The inspectors concluded that the ISI program was in place, had been implemented, and included the elements identified in the LRA. When implemented as described, there is reasonable assurance that adequate inspections required by ASME will be performed through the period of extended operation.

7. Small Bore Class 1 Piping Inspection

This program will be a new program credited for management of cracking due to flaw growth or stress corrosion cracking in piping sizes less than 4-inches. The applicant plans to perform one time inspections via destructive testing of a bounding sample of piping. The applicant plans to select samples based on risk and most susceptible areas using guidance from ongoing industry initiatives. Future inspections will be based on initial sample results.

The inspectors reviewed the applicable LR evaluation and discussed plans with applicant personnel. When implemented as planned, this program should provide for adequate inspections to evaluate cracking in small bore piping.

8. Bottom Mounted Instrumentation Inspection

This program is an existing program which assures periodic ECT inspections as a result of NRC Bulletin 88-09, Thimble Tube Thinning in Westinghouse Reactors. The program manages loss of material on the bottom mounted flux thimble tubes due to wear. Inspection criteria has been established in accordance with the latest Westinghouse guidance.

The inspectors reviewed the applicable LR evaluation, reviewed the applicable plant procedure, reviewed the latest inspection results, and held discussions with responsible applicant personnel. The inspectors concluded that the Bottom Mounted Instrumentation Inspection program was in place, had been properly implemented, and was consistent with the description in the LRA. Continuing implementation of this this program provides reasonable assurance that the flux thimble tubes will be adequately inspected.

9. Above Ground Tank Inspection

This is a new one time activity that will detect and characterize loss of material due to galvanic and general corrosion on internal surfaces of tanks and components exposed to moist air conditions, treated water in which dissolved oxygen level is not controlled, or alternate wetting and drying of treated or borated water. The inspection will use accepted examination techniques on a sample of the most susceptible locations. The inspection will be performed prior to the period of extended operation. The inspectors reviewed the program documentation and discussed the program with station personnel. Technical Report TR00160-020, Attachment I, Above Ground Tank Inspection, Rev. 0, documented this aging management activity and identified the scope, inspection attributes and acceptance criteria. Procedures for this activity were not yet developed.

The inspectors noted that there were no inspections planned for monitoring loss of material due to potential galvanic or general corrosion of the bottom of the Condensate Storage Tank (CST) although this tank was outdoors exposed to rain and water accumulation and appeared to be in contact with the ground. This was the subject of RAI 3.4-13. The inspectors verified the applicant's response which stated that the design of the CST foundation prevented the establishment of a galvanic cell with the ground and induced drainage to prevent water accumulation at the tank bottom. The CST as-built foundation drawings showed that the tank was mounted on a four foot high concrete pad and two foot high concrete ringwall with clean sand in-fill and drainage pipes to prevent accumulation of water under the tank. The tank bottom at the 436 foot elevation was eleven feet above the ground water elevation of 425 feet and one foot above the ground elevation. Loss of material of the tank bottom would be at the same rate as the tank sides which are exposed to a moist air ambient environment. This rate is not a concern over the extended period of operation. The tank exterior is within the scope of the Mechanical Components Inspection Program.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. When implemented, there is reasonable assurance that the intended function of the above ground carbon steel tanks will be maintained throughout the period of extended operation.

10. Diesel Generator Systems Inspection

This is a new one time inspection activity to detect and characterize the potential loss of material due to general corrosion and corrosive impacts of alternate wetting and drying in carbon steel diesel air start system components. The inspection will use suitable examination techniques at the most susceptible locations. The inspection will be performed prior to the period of extended operation. The inspectors reviewed the program documentation and discussed the program implementation with responsible station personnel. This aging management activity is described in TR00160-020, Attachment VIII, Diesel Generator Systems Inspection, Rev. 0, which identifies the activity scope, parameters monitored, and acceptance criteria. The scope was being revised to include the diesel mufflers, which was addressed in RAI 3.3.2.4.7-5. The inspectors noted the scope description was inconsistent between the program description in TR-00160-020, Attachment VIII, and the proposed UFSAR 18.2.13 description of the program, in that the UFSAR did not include the diesel exhaust system components. The applicant stated that the UFSAR 18.2.13 scope description would be revised to be consistent with the AMP description in TR 00160-020.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. When implemented, there is reasonable assurance that the program will provide adequate assessment and resolution of potential loss of material in the diesel generator carbon steel support system components.

11. Boric Acid Corrosion Surveillances

This is an existing program that manages the aging affects due to loss of material from aggressive chemical attack of borated water leaks on susceptible mechanical and structural components located in the Reactor Building and in specific areas of the Auxiliary, Intermediate, or Fuel buildings. This program also manages boric acid intrusion in electrical equipment located in proximity to borated water systems. This program was developed in response to NRC Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants. Elements of the Boric Acid Corrosion Surveillance include the identification of leakage locations, procedures for locating small leaks, and corrective actions to ensure the boric acid degradation does not lead to degradation of structures and components and subsequent loss of intended function. The inspectors reviewed the program documentation, discussed the program with the responsible station personnel, reviewed documentation of boric acid walk down inspections, program self-assessments, station implementing procedures for the program, and documentation which resolved boric acid residues identified in the plant. The program is described in TR 00160-020, Attachment III, Boric Acid Corrosion Surveillances, Rev.0

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

12. Waste Gas Inspection

This is a new one time inspection activity that will detect and characterize loss of material due to crevice and pitting corrosion and cracking due to stress corrosion cracking in Waste Gas System stainless steel components exposed to uncontrolled treated water. The inspection will

be performed prior to the period of extended operation. The inspectors reviewed the program documentation and discussed the program with the responsible station personnel. The program is documented in TR-00160-020, Attachment XXIV, Waste Gas System Inspection, Rev.0. This technical report identified the scope, inspection attributes and acceptance criteria for this activity. No procedures are yet developed to implement this inspection activity.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. When implemented, there is reasonable assurance that the intended function of the Waste Gas System stainless steel components exposed to uncontrolled treated water will be maintained throughout the period of extended operation.

13. Buried Piping and Tanks Inspection

This is a new inspection activity that will manage loss of material due to crevice, general, MIC, pitting, and galvanic corrosion on external surfaces of components exposed to an underground environment. The scope includes diesel generator carbon steel fuel oil piping and tanks, carbon steel components in the emergency feedwater, fire services and service water systems. Preventive measures to mitigate corrosion were provided by protecting external surfaces of buried piping and components with coatings or wrappings. This program provides visual examination of the coatings for degradation when components are made accessible by excavation for maintenance or some other reason. Prior to the period of extended operation the program will be enhanced by revising excavation procedures to require coating inspections when in-scope equipment is exposed. The inspectors reviewed the program documentation, discussed the program with responsible staff, and reviewed draft revised excavation procedures. This aging management program is documented in TR00160-020, Attachment V, Buried Piping and Tanks Inspection, Rev. 0, which identified the scope, inspection attributes, and acceptance criteria for this activity.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. When implemented, there is reasonable assurance that the intended function of the buried carbon steel tanks and components will be maintained through the period of extended operation.

14. Chemistry Program

This is an existing program which is credited for mitigating the aging effects of loss of material due to crevice, general, galvanic, MIC, and pitting corrosion, as well as cracking and fouling of heat transfer surfaces. The aging effects are mitigated by controlling the chemical species that cause the underlying aging mechanisms. Station chemistry procedures specify sampling scope, acceptance criteria, frequency, and corrective actions for sample results not within acceptance criteria. The inspectors reviewed the program documentation, discussed the program with the Chemistry department staff, reviewed chemistry sampling procedures and acceptance criteria, reviewed trends of sampling results, and documentation of corrective actions for results which did not meet acceptance criteria. The aging management program is documented in TR00160-020, Attachment VII, Chemistry Program, Rev. 0, which identifies scope, parameters monitored, program attributes, implementing procedures, and recommended program enhancements for license renewal.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. As implemented, there is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

15. Preventive Maintenance Activities - Terry Turbine

This is an existing program that manages the loss of material due to general corrosion in carbon steel with an internal air space ambient environment for the Emergency Feedwater pump steam turbine which includes the turbine casing and piping and components in the steam supply and exhaust paths. The inspectors reviewed the program documentation, discussed the program with the responsible station staff, reviewed PM procedures and schedules, and the documentation of the last Terry Turbine inspection performance. The aging management program is documented in TR00160-020, Attachment XXV, Preventive Maintenance Activities, Rev. 0, which identified the procedure implementing this program, inspection scope, inspection attributes, acceptance criteria, and recommended enhancements for license renewal.

The inspectors noted two inconsistencies in the AMP documentation. The scope description in TR 00160-020, Attachment XXV, was inconsistent with proposed UFSAR 18.2.4 in that the UFSAR description did not include the Terry Turbine steam exhaust components in scope. The applicant stated that UFSAR 18.2.4 would be revised to be consistent with TR-00160-020. Additionally, TR-00160-020, Attachment XXV, stated that procedure MMP-300.015, Turbine Maintenance - Emergency Feedwater Pump, Rev. 12 , would incorporate the actions to accomplish this AMP. However, this procedure which periodically disassembles and inspects the Terry Turbine does not address the exhaust system components. The applicant stated that TR-00160-020 would be revised to clarify that the steam exhaust components were of the same material and exposed to the same environment as the turbine casing and therefore inspection of the casing would provide monitoring of the exhaust component conditions.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. As implemented, there is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

16. Service Air System Inspection

This is a new one time inspection to detect and characterize loss of material due to general corrosion from an internal moist air environment on Service Air System carbon steel piping and components that function to maintain a pressure boundary for containment integrity. The inspection will use a combination of volumetric and visual examination techniques at the most susceptible locations and will be performed prior to the period of extended operation. The inspectors reviewed the program documentation and discussed the program with the responsible station personnel. The program is documented in TR-00160-020, Attachment XX, Service Air System Inspection, Rev.0. This technical report identified the scope, inspection attributes and acceptance criteria for this activity. No procedures are yet developed to implement this inspection activity.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had

provided adequate guidance to ensure aging effects will be appropriately assessed and managed. When implemented, there is reasonable assurance that the intended function of the Service Air System carbon steel components exposed to a moist air environment will be maintained throughout the period of extended operation.

17. Battery Rack Inspection

This is an existing activity which performs a periodic visual inspection of the Vital Battery rack and the Diesel Fire Service Pump Battery rack to identify degradation due to corrosion. The inspectors reviewed the program documentation, discussed the program with the responsible station staff, reviewed PM procedures and schedules, reviewed documentation of the last battery rack inspections, and observed the current conditions of the racks. The aging management program is documented in TR00170-003, Structures Aging Management Review for License Renewal, Rev. 0, section 7.4, Battery Rack Inspection, which identified the procedures implementing this program, inspection scope, inspection attributes, and acceptance criteria.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. The applicant had provided adequate guidance to ensure aging effects will be appropriately assessed and managed. As implemented, there is reasonable assurance that the intended function of the battery racks will be maintained through the period of extended operation.

18. Reactor Head Closure Studs Program

The reactor head studs are removed each outage and inspected under an existing program. These large studs physically connect the reactor vessel head to the vessel. A systematic, repetitive Inservice Inspection program (Subsection IWB) performs non-destructive testing of the studs each refueling outage when the studs are removed for the refueling. The inspectors reviewed the procedures that direct the removal and installation inspection. Additionally, the inspector looked for stud related problems in the applicant's corrective action program over the last several years to determine the extent of problems listed in the applicant's background information was accurately portrayed and that they had been dispositioned properly. The inspectors were satisfied with the existing procedures and with the corrective actions to emergent problems. The inspectors concluded that the applicant had provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the reactor head closure studs will be maintained through the period of extended operation.

19. Material Handling Inspection System Inspection Program

The applicant has a number of important cranes in their existing inspection program. The cranes in the program were included in the AMP program under license renewal. The program will cover the safety and non-safety related lift devices to manage corrosion. The inspectors reviewed several crane-related inspection procedures (MMP-165 series documents) finding that they reflected the industry guidance standards (ANSI B30.2, NUREG-612) and are of good quality. The inspectors visually inspected three of the cranes in the AMP finding them in good general shape. The inspectors concluded that the applicant has provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

20. Pressure Door Inspection Program

This existing plant specific program provides examination guidelines for periodic inspection of pressure doors. The applicant's pressure doors are Nuclear Safety Related or Quality Related. Most of these doors are also fire doors. These doors are required to be operable during plant operating mode 1, 2, 3, and 4. The inspectors reviewed the existing program for the attributes as listed in supporting documents, the application, and the FSAR. The inspector reviewed the operating experience associated with these types of doors. The parameters monitored for the doors and door hardware are loss of material of doors and door hardware. The inspectors performed walk down inspections on many of the plant pressure doors finding them in good condition. The inspectors concluded that the applicant has provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the pressure doors will be maintained through the period of extended operation.

21. Service Water System Reliability and In Service Testing Program

The applicant had a number of associated programs to manage, sample, test, and maintain the Open Cycle Cooling Water System, the Service Water System (SW), and associated interfacing system points. The SW flows cooling water from the plant's pond impoundment to the cooling loads necessary for safe shutdown and emergency core cooling equipment support. The non-safety portion of the system cools main turbine loads during normal plant operations. The inspectors reviewed several of the procedures the applicant credited for the program. Additionally, the SW system had recently been inspected by the NRC in May and then July 2003 (NRC inspection reports 50-395/2003-002 and 003) and found the system generally acceptable at those times. The inspectors toured the major parts of the system. The inspectors concluded that the applicant has provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the service water system will be maintained through the period of extended operation.

22. Flow Accelerated Corrosion (FAC) Program

The flow accelerated corrosion program periodically measures the pipe wall thickness in several types of piping systems such as the main steam system. The FAC program engineer reviews the data for adverse wall thinning. With the data fed into a computer software program, the data is examined and compared to present and historical data values making predictions as to wear versus minimum wall values. Combined with engineering oversight, the existing program has been used to successfully predict and manage pipe and component replacements for many years. The inspector reviewed select planned outage piping replacements against the computerized projections and was satisfied with the projections and engineering judgement applied to the planning. Operation event data review indicated no monitored piping failures. The existing program appeared complete and functioning. The inspectors concluded that the applicant has provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

23. Preventive Maintenance Activities - Ventilation Systems Inspections

This plant specific, existing Ventilation Systems Inspection program will monitor the conditions on the certain plant air handling systems. The program will monitor and manage the material

loss due to boric acid corrosion, galvanic corrosion, and general corrosion in carbon steel, galvanized steel, and copper components, and particulate in aluminum, copper and copper-nickel heat exchanger components. The inspectors reviewed program documents, FSAR requirements, and existing maintenance procedures. The inspectors toured and inspected many of the fan housings, ducts, and related system components finding them in good condition. The inspectors discussed the systems and their problems with the system engineering group. The inspectors concluded that the applicant had provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the ventilation systems will be maintained through the period of extended operation.

24. ASME Code Section XI, Subsection IWF Program

This existing program has been in place and functioning for the life of the plant. This program inspects the ASME Code Section XI Class 1, 2, and 3 component supports and fasteners as described in the licensee's Inservice Inspection program, ISE-3, that is reviewed and approved by the NRC. The program is to monitor and manage material loss due to corrosion. During this inspection, the inspectors successfully sampled the program output on several supports on the safety injection system and the reactor coolant pumps. The site specific NRC approved program requirements matched those listed in the applicant's AMP document. The inspectors toured and inspected many supports in the auxiliary and intermediate buildings of the plant finding them in good condition. The inspectors concluded that the applicant had provided adequate guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

25. Liquid Waste System Inspection

This new inspection activity will manage the loss of material from stainless steel system components due to borated water attack. The liquid waste systems consists of nuclear plant drains and liquid water processing equipment. The components to be inspected are valve bodies, heat exchangers, and piping. The applicant had developed a draft (model) procedure for this one time inspection. The inspectors reviewed the document finding it generally well outlined, general in nature, and still under development. The components listed matched those listed the applicant's AMP. The criteria was partially indicated and there were task due dates through 2013. Should inspections find problems, the stated intent was to enter the finding into the corrective action program, repair the component, and followup with additional corrective action as necessary. When developed, the new inspection activities should assess and manage potential aging problems. There is reasonable assurance that the intended function of the liquid waste system will be maintained through the period of extended operation.

26. Reactor Building Cooling Units (RBCU) Inspection

This is a new one time inspection activity that will detect and characterize the loss of material on the RBCUs condensate collection drain lines. If found, the material loss would be due to crevice corrosion, pitting corrosion, and/or cracking due to stress corrosion. The boric acid potentially in the containment atmosphere could condense on the RBCU tubes and run through the stainless steel drains. The applicant has stated that the inspection will be done before the end of the extended period of operation. The inspection would be a visual or volumetric examination with no criteria established to date.

27. Heat Exchanger Inspection

This new one-time inspection activity will detect and characterize material loss due to selective leaching and erosion-corrosion as well as heat exchanger fouling due to particulates in the treated water side of the components. This inspection is applicable to the copper, copper-nickel, and brass heat exchanger components in the following systems: Air Handling [ventilation], Component Cooling, Chemical and Volume Control, Diesel Generator, Emergency Feedwater, Chilled Water, and the Local Ventilation and Cooling Systems. In the description documents, the applicant has indicated that the proposed inspections will be visual and/or volumetric. The proposed inspections would be completed before the end of the extended period of operation. The inspectors note that the heat exchangers for the emergency diesels were recently replaced and enhanced. The service water side of the heat exchangers are routinely inspected and cleaned. The chemistry of the treated water side of the exchangers is credited with preventing fouling in heat exchanger components. These inspections should provide additional assurance of equipment operability. When developed, the new inspection activities should assess and manage potential aging problems. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

28. Inspection for Mechanical Components

This new inspection activity will manage the loss of material due to galvanic, general, and pitting corrosion, and cracking due to radiation and thermal embrittlement of external surfaces of mechanical components within the scope of licensee renewal. This is a condition monitoring program for components made from carbon steel, low alloy steel, and other susceptible material. In the applicant's document TR00160-020, Attachment XIII, the applicant has listed 37 systems to be visually inspected. The inspectors toured many of the systems during plant inspections finding them in good general condition. The inspection process had been carried out under the maintenance rule previously. The applicant has yet to determine which group at the site will do the inspections, what acceptance criteria will be applied, the degree of disassembly [e.g., pitting under insulation], or the frequency. The applicant plans to develop a procedure similar to an existing structural inspection document. When developed, the new inspection activities should assess and manage potential aging problems. There is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

29. Fire Protection

The inspectors reviewed a draft of the document Fire Protection Program Post Renewal AMP Implementation Package. The applicant is crediting the existing fire protection program as an aging management program, with three enhancements.

> Sprinkler heads will either be replaced or a representative sample removed and tested, per the NFPA code, prior to the end of the operating term. Subsequent replacement or field testing of representative samples will be done every 10 years thereafter.
>
> Ultrasonic testing of a sample of stagnant piping sections will be performed prior to the end of the current operating term and every 10 years thereafter.
>
> A new one-time Brinnell hardness test or equivalent will be performed on brass and cast iron components in the fire protection system just prior to the end of the current

operating term. The test is done to detect and characterize the effects of selective leaching, if any, on those components.

The inspectors reviewed numerous current procedures currently used to implement the Fire Protection Program. The applicant had compiled over five years of test records of various fire protection equipment. The inspectors reviewed those test record along with records of the last two system flow tests. The records were complete and the test results were satisfactory. The inspectors concluded that the Fire Protection Program has been functioning satisfactorily.

C. Review of Electrical Systems Aging Management Programs

1. Electrical Equipment AMPs

X1.E1 NON-EQ INSULATED CABLES AND CONNECTIONS INSPECTION PROGRAM

The applicant's response to RAI 3.6-1 states that the Non-EQ Insulated Cables and Connections Inspection Program will be consistent with section XI.E1, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, of the GALL report. The response also states that the program will also be consistent with ISG-5, Interim Staff Guidance on the Identification and Treatment of Electrical Fuse Holders for License Renewal. This program will be applied to Non-EQ insulated cables and connections including instrumentation cable with the exception that GALL program XI.E2, Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits may be applied to high-range-radiation and neutron flux monitoring instrumentation cables, which have high voltage, low-level signal applications that are sensitive to reduction in insulation resistance, instead of this program. This is a new inspection program yet to be developed that will assess the condition of non-EQ insulated cables, connections, and in-scope, passive, non-EQ fuse holders. The specific non-EQ insulated cables and connections that will be included in the aging management program include accessible non-EQ insulated cables and connections, including splices, terminal blocks, and fuse holders that are found susceptible to potential degradation in adverse thermal and radiological areas of the plant. Selection of the areas to be inspected will include considerations for circuits with potentially significant ohmic heating. Passive, non-EQ fuse holders located outside of active devices that have been identified as being susceptible to aging effects in the Aging Management Review are considered within the scope of this program. The parameters to be inspected include visual evidence of cable jacket or connection surface abnormalities such as embrittlement, cracking, swelling, discoloration, surface contamination, presence of standing water or moisture, or any other visible evidence of age-related degradation, which may lead to loss of the intended function. The metallic fuse clip portion of any in-scope, passive fuse holders found to be susceptible to aging effects will be additionally monitored for aging stressors such as vibration, thermal cycling, electrical transients, mechanical stress, fatigue, corrosion, chemical contamination, or oxidation of the connecting surfaces. In this aging management program, thermography, contact resistance testing, or other appropriate tests will be used to identify any existence of aging degradation for these fuse clips. These parameters will be monitored or inspected on a representative sample basis. The Inspection Program will be initially performed prior to the period of extended operation and then at 10-year intervals thereafter. The response states that lessons learned during the performance of the inspections, experience gained and shared by other utilities, and other inspection techniques developed in the industry will be considered by the applicant as proposed enhancements to the program so that the effects of aging will continue to be adequately managed.

X1.E2 ELECTRICAL CABLES NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS USED IN INSTRUMENTATION CIRCUITS

This is a new aging management program yet to be developed. Exposure of electrical cables to adverse localized environments caused by heat, radiation, or moisture can result in reduced insulation resistance (IR). Reduced IR causes an increase in leakage currents between conductors and from individual conductors to ground. A reduction in IR is a concern for circuits with sensitive, low-level signals such as radiation monitoring and nuclear instrumentation since it may contribute to inaccuracies in instrument circuits. The purpose of this aging management program is to ensure that these electrical cables used in instrumentation circuits with sensitive, low-level signals exposed to adverse localized environments caused by heat, radiation or moisture will be maintained through the period of extended operation. In this aging management program, calibration results of routine surveillance testing programs are used to identify the potential existence of aging degradation. For example, when an instrumentation circuit is found to be out of calibration, an additional evaluation of the circuit is performed to determine if the cause is cable degradation. This aging management program applies to non-EQ, high-range-radiation and neutron flux monitoring instrumentation cables used in high voltage, low-level signal applications that are sensitive to reduction in insulation resistance. An overlap exists between this program and program XI.E1 in that XI.E1 could be applied to all instrumentation cables, but will not be applied to high-range-radiation and neutron flux monitoring instrumentation cables if the XI.E2 program is applied. The first reviews for license renewal are to be completed before the period of extended operation and every ten years thereafter. All calibrations or surveillances that fail to meet acceptance criteria will be reviewed at that time.

Alternate to XI.E2 Program
LICENSE RENEWAL AGING MANAGEMENT PROGRAM FOR NON-EQ ELECTRICAL CABLES USED IN INSTRUMENTATION CIRCUITS

In the RAI response the applicant included a proposed alternate to the X1.E2 program. In this aging management program, an appropriate test, such as an insulation resistance test, will be used to identify the potential existence of a reduction in cable IR. The applicant contends that this program is an acceptable alternative to aging management program XI.E2. Testing methods have yet to be determined but may include insulation resistance tests, time domain reflectometry tests, I/V testing, or other testing judged to be effective in determining cable insulation condition. Following issuance of a renewed operating license, the initial test would be completed before the end of the initial 40-year license term and repeated at 10 year intervals.

XI.E3 AGING MANAGEMENT PROGRAM FOR INACCESSIBLE MEDIUM-VOLTAGE CABLES NOT SUBJECT TO 10CFR50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS

The RAI response states that this AMP is consistent with section XI.E3, Inaccessible Medium-Voltage Cables Not Subject To 10CFR50.49 Environmental Qualification Requirements, of the GALL report. This is a new yet to be developed aging management program that will assess the condition of inaccessible medium-voltage cables not subject Environmental Qualification requirements to provide assurance that the aging effects of concern will not result in loss of the intended functions during the period of extended operation. Most electrical cables in nuclear power plants are located in dry environments. However, some cables may be exposed to condensation and wetting in inaccessible locations, such as conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried

installations. When an energized medium-voltage cable is exposed to wet conditions for which it is not designed, water treeing or a decrease in the dielectric strength of the conductor insulation can occur which can potentially lead to electrical cable failure. In this AMP periodic actions are taken to prevent or minimize the possibility that cables may be exposed to moisture, such as inspecting for water collection in cable manholes and conduit, and draining water, as needed. In-scope, medium-voltage cables exposed to moisture and significant voltage will be tested to provide an indication of the condition of the conductor insulation. The initial test performed will be determined prior to the period of extended operation for detecting deterioration of the insulation system due to wetted conditions. The specific non-EQ medium voltage insulated cables subject to moisture and significant voltage that will be included in this AMP are the two circuits serving the Service Water Pump Motors. These circuits are inaccessible as they are routed in underground duct, except at electrical manholes or where they exit the duct bank, and are medium-voltage cables within the scope of license renewal that are potentially exposed to moisture simultaneously with significant voltage. The specific type of test performed will be determined prior to the initial test. This will be a test that will not damage the cable itself. The first tests are to be completed before the period of extended operation and will be repeated every 10 years.

2. Environmental Qualification Program

The Environmental Qualification (EQ) Program is a well established program to ensure that electrical components, such as cables, that may be subject to a harsh environment are properly constructed to perform their intended function even when subject to that harsh environment. The inspectors reviewed the following plant procedures which implement the EQ program.

ES-305 EQ Process and Control, Rev. 0
ES-112 Control and Maintenance of the Equipment Qualification Data Base and Instrument Loop Insulation Resistance Calculation, Rev. 1
ES-504 Equipment Aging and Performance Trending Rev. 4

The inspectors discussed the status of the EQ program with the applicant engineer in charge of the program. The applicant hired contractors to compose revised calculations to update the EQ documentation binders to reflect operating the equipment for 60 years. The calculation work has been complete but has not yet received final applicant review before being included into the binders. The work did not identify any plant EQ equipment whose service could not be extended to 60 years of plant operation. From a list of revised calculations the inspectors selected to review ones for Barton Pressure Transmitters 763 and Target Rock Solenoid Operated Valves 97A-001. The inspector found the calculations to be of good quality and the results acceptable. The applicant stated that these revised calculations will be fully integrated into the EQ documentation binders before the end of the current operating period.

3. Electrical Manholes

At Summer power, instrumentation and control electrical cables are routed underground with electrical manholes along the route. The manholes were used for original cable installation and are available for maintenance and cable replacement. The manholes are susceptible to flooding from rain water, ground water or other sources and they should be periodically pumped out to avoid having energized cables under water. There is an industry concern that submerged continuously energized power cables are susceptible to early failure. The inspectors asked the applicant to open a sample of the manholes containing safety related cables. The applicant opened electrical manhole MH-2, which contains safety related cables

running between MH-1 in the auxiliary building and the service water pump house and condensate storage tank. The inspectors observed that there was some water below the cables and was told the water had been pumped down about 12 inches the previous day. The applicant has an established preventive maintenance task to inspect MH-2 monthly and pump out water if needed. MH-2 is the high point of the duct bank run so in the event of severe flooding, water would run out through the duct bank on either end. The inspectors subsequently examined MH-1 and the service water pump house basement at each end of the cable run and observed that they were dry.

The inspectors inquired about a program to periodically inspect other manholes for water. The inspectors reviewed procedure CMP-700.012 Embedded Pull Box Inspection, Rev. 0 5/6/98. This procedure calls for an annual inspection of concrete embedded cable pull boxes throughout the plant to inspect them for water and drain as necessary. The inspector examined a sample of data sheets for various pull boxes for the last five years. The data appeared acceptable and demonstrated that the procedure was being accomplished.

The inspector reviewed procedure CMP-700.013 Inspection of Electrical Manholes, Rev. 0 10/23/02. This procedure was written in response to a Condition Evaluation Report CER 02-2334 which states that civil maintenance is pumping out manholes monthly but they need a procedure. The inspectors inquired about past data sheets from this procedure and were told that none could be found. It was found that there were problems in implementing procedure CMP-700.013 Inspection of Electrical Manholes in that workers were only inspecting manholes listed in the “scope” statement rather than the complete list in Enclosure 1. This resulted in MH-2, 8, and 9 not being done under this procedure. However MH-2 and 8 were being inspected under a separate preventive maintenance task, but 9 was apparently not being done. The workers thought they had completed data sheets but none could be found. The applicant wrote a CER 03-2507 to correct the problems. Before the end of this inspection the inspectors were shown a draft revision of the procedure intended to clarify the which manholes are to be inspected.

D. Review of Structural Component Aging Management Programs

1. Tendon Surveillance Program

The Tendon Surveillance Program is listed in Section 7.17 of TR00170-003, “Structures Aging Management Review for License Renewal,” Revision 0, 7/3/02. SP-228, “Surveillance of Reactor Building Post Tension System,” Revision 12, 5/4/00 specifies that this program is following the recommendation of Revision 3 of Regulatory Guide (RG) 1.35. Section 5.1.0 specifies the surveillance request and Section 5.2.5 predicts the tendon lift off forces following Revision 3 of RG 1.35.1. Surveillance test procedure STP-160.001, “Containment Tendon Test,” Revision 4, 9/21/00 specifies the frequency and process for the containment tendon test and the reporting to NRC per Technical Specification 4.6.1.6.1. Section 4.0 has the test frequency and Section 7.0 has the acceptance criteria. These sections contain the same requirement as RG 1.35.

The sixth tendon surveillance was performed in 2000 from September to December. Three tendon in each family (vertical, horizontal, and dome) with one control tendon were tested. The inspectors reviewed the results and found that all the lift off forces of the vertical and dome tendons are above 95% of the predicted value. One of the horizontal tendons tested show a lift off force to be between 90% and 95% of the predicted value. In accordance with RG 1.35, two tendons next to the questionable tendon were tested to check the lift off force. One of those

tendon showed a reduced lift off force (between 90% and 95%). The responsible engineer concluded at this point that the group average was greater than the minimum required (1095 kips vs 1000 kips) and the regression analysis showed that adequate force in the tendon would remain till the next surveillance period.

The inspectors reviewed the regression report entitled "Sixth (20th year) Period Physical Tendon Surveillance of the VC Summer Nuclear Plant," Revision 0, 11/22/02 by Precision Surveillance Corp of East Chicago, Indiana. It concludes, in Page ii, that "there is no abnormal degradation of the post tension system". On Page 53 of the report, it shows the forecast for the tension in the horizontal tendons will be good until at least the end of the current operating term of 40 years. At year 40, the average lift off force is predicted to be 1028 kips and the minimum lift off force is 1000 kips. The results of future surveillances will determine if further action is needed. The inspectors discussed this matter with NRR technical staff and they do not have any concern about the condition of the Summer post tension system.

2. Containment ISI Program - IWE/IWL

The Summer Containment ISI Program is described in Section 7.9 of TR00170-003. It uses Quality System Procedure QSP-506, "IWE and IWL Visual Examination," Revision 0, 3/15/00 to perform the inspection. Section 1.1 of the QSP states the purpose of this procedure is to define the requirements for visual examinations at VC Summer as defined in ASME IWE and IWL. Enclosure 10.1 of this QSP lists the actions required for conditions that exceed a certain value. The corrective actions are defined in documents ST-07, and ASME Section XI. Applicant's design Guide ST-07, "Containment Inservice Inspection Evaluation Criteria," Revision 0, 2/29/00 lists the evaluation and acceptance criteria for both the containment steel liner and the containment concrete components in Sections 5.2 and 5.3, respectively.

The inspectors reviewed the results of the 2000 IWE/IWL inspection which is the first such inspection, so the applicant called it a baseline inspection. This inspection was conducted during RF-12 and revealed and documented a considerable number of deficiencies which were below the thresholds of ST-07 but most of them were considered to be of no structural significance by the responsible engineer. The applicant evaluated those conditions and only addressed the conditions that exceeded the ST-07 threshold criteria and/or are likely to experience accelerated degradation or aging, thereby, requiring augmented examination.

The IWE augmented inspections are:

Liner plate bulging (CER 00 -1386)

Work Request (WR) 99-20256-12 was issued on 10/20/00 requesting ultrasonic examination for the bulging liner plate at several places. All measurements were within allowable (10 percent).

Dome liner plate coating (CER 00 -1388)

Technical Work Record RW-04586 was issued to address the liner coating degradation and request the work be done during RF-13.

Corrosion of RHR & Spray guard pipes (CER 98 -1047)

Ground water in-leakage at the Residual Heat Removal & Reactor Building Spray pipe penetrations through the Auxiliary Building wall (EL 400) contains black sludge material. The guard pipes at the two penetrations were cleaned on 10/3/00 and ultrasonically tested on 10/5/00 and it was found that the minimum wall thickness of the guard pipes are well over the minimum requirement (0.401" & 0.378" vs 0.166"). However, an augmented inspection program was initiated to examine the guard pipes during every outage until a permanent solution is found to stop the in-leakage of ground water.

The IWL augmented inspections are:

Tendon access gallery concrete leaching (CER 00 - 0988)
Tendon access gallery corrosion (CER 00 - 0988)

The condition evaluation requested a chemical analysis of the ground water & leaching material. A chemical test report by Applied Technical Services, INC of Marietta, Georgia on 9/1/00 indicated the leaching material is $CaCO_3$, the corrosion material is iron oxide, and the ground water is high alkaline with a pH value 0f 12.5.

The augmented inspection, which was conducted during RF-13, found that the conditions were about the same. These augmented inspections will continue to monitor the conditions.

3. 10 CFR 50 Appendix J General Visual Inspection

Section 7.1 of TR00170-003 lists the 10 CFR 50 Appendix J General Visual Inspection as an aging management program to manage aging effects of the Reactor Containment Building. Per Section C.3 of RG 1.163 and Surveillance Requirement 4.6.1.6.3 of the Summer Technical Specification, a general visual inspection is conducted prior to the 10 CFR 50 Appendix J Integrated Leak Rate Test (ILRT). The purpose of this inspection is to identify any problems that may affect the ILRT results. The TR further states that this inspection will not be conducted if an inservice inspection IWL/IWE is performed.

This program was used to visually inspect the containment prior to the leak rate test before the IWE/IWL was implemented in 1996. The last general visual inspection was conducted in October, 1997 during RFO-10 and reported in STP-207.002, “Inspection of Containment”. The inspectors reviewed the latest report and found it satisfactory.

4. 10 CFR 50 Appendix J Leak Rate Testing

STP-206.001, “Integrated Leak Rate Test,” Revision 3, 2/17/93 states that the purpose of this program is to ensure and verify that the ILRT of the containment is within the limit specified in Section 4.6.1.2 of the Technical Specifications. The frequency and acceptance criteria of the test is specified in GTP-315, “Containment Leakage Rate Testing Program,” Revision 2, 5/3/00. Section 4.1.3.B.1 of GTP-315 states that the Type A ILRT shall be performed at least once per 10 years. Sections 4.1.4.B.1 and 4.1.4.B.2 specifies the as-found leakage rate for primary containment Type A test shall be less than or equal to 1.0 La and the As-left Type A leakage rate shall be less than or equal to 0.75 La, respectively.

The inspectors reviewed the last Type A leakage rate test report (April, 1993) and found the As-left ILRT result is 0.1368 wt%/day which is less than 0.75 La (0.15 wt%/day). The inspectors concluded that this program is adequately checking the integrity and leak rate of the containment.

5. Maintenance Rule Structures Program

This program monitors the following in-scope structures. They are: Auxiliary Building, Control Building, Diesel Generator Building, Electrical Manhole #2, Fuel Handling Building, Fire Service Pump House, Intermediate Building, North Berm, Reactor Building, Service Water Discharge Structures, Service Water Intake Structures, Service Water Pond Dams, Service Water Pump House, Transformer Area Foundations, Transformer Towers and Foundations from Emergency Auxiliary Transformer to OCB. 8892, Turbine Building, and Large Tank Foundations.

Engineering Service Procedure ES - 437, “Inspections for Maintenance Rule Structures,” Revision 1, 4/19/00 lists the requirements for monitoring structures. Section 2.0 lists the scope to be ”monitoring the performance condition of SSCs and takes appropriate corrective action if the condition or performance of a structure does not conform to established goals”. Section 6.2 specifies the frequency of inspection is every 5 years and Section 6.9 addresses corrective actions. But this procedure does not address inaccessible areas. The applicant agreed to revise the procedure to add an entry to address the inaccessible areas. The applicant also agreed to revise CMP-400.001, “Excavation, Backfill, and Earthwork,” Revision 5, 10/8/96 to add a step in Section 5 of this procedure to indicate that when concrete surface in exposed during excavation, Engineering or Engineering Services shall be notified to perform a visual inspection.

The 2000 inspection was the most recent inspection. An assessment was provided by the responsible engineer to address the results of the inspection. The assessment addresses all aspects of the visual inspection from Reactor Containment IWE/IWL to diver inspection of the Service Water Intake Structures. The summary and conclusions, as stated in Section 6.0 of the assessment, indicates that the important to maintenance rule structures are currently capable of fulfilling their intended functions, however, a trend of accelerated aging conditions has been identified. Those conditions (previously noted as acceptable with deficiencies) should be evaluated for corrective action. There are a total of 17 conditions, distributed over almost every structure, applicable to structures within the scope of license renewal. The engineering evaluation of those conditions are all acceptable or acceptable with deficiencies and will be inspected and evaluated during the next inspection.

The inspectors also reviewed some previous findings and resolutions. Non-conformance notice (NCN) 99-0489 was issued in 4/13/99 to address rust spots found on the containment liner at azimuth 240 on 412' level (the mat level). The engineer’s resolution was to clean the rust area, ultrasonic test (UT) the liner, and if the thickness is adequate, then recoat the liner and re-furbish the moisture barrier. UT was performed on 4/19/99 at 8 locations, and only one spot was below nominal thickness (0.245" vs 0.250"). All other spots (there are four spots per location, if not restricted) are greater than 0.250". Technical Work Record GP10606 was issued on 4/20/99 to record the disposition of NCN 99-0489. It was decided that the liner is not in a degraded condition and the liner should be recoated to its original condition. The NCN was finally closed on 4/27/99 after a 10 CFR Part 21 assessment. The inspectors found these actions acceptable.

6. Service Water Pond Dam Inspection Program

This program performs inspection for the Service Water Pond Dams (North Dam, South Dam, East Dam, and West Embankment). This program consists of several separate inspections:

The Service Water Pond Dam inspection (RG 1.127), including diver's inspection, by the applicant every 5 years.
The Federal Energy Regulatory Commission (FERC) dam inspection every 2 or 3 years

The operating license condition 2.C.5 survey and monitoring for the movement and alignment of the North Dam, South Dam, and the West Embankment every 5 years.

Visual inspection walkdown, annually.

During construction of the Summer Nuclear Plant, the Service Water Intake Structure and Pump House exhibited settlement which exceeded the predictions. Summer operating license condition 2.c.5 requires that the Service Water Intake Structure and Service Water Pump House be monitored for settlement semi-annually for the life of the plant to preclude any excessive settlement which may jeopardize the plant operation. The survey includes the North and South Dams and the West Embankment which may affect the settlement of the Service Water Intake Structure and/or Pump House. Calculation DC02210-001 provides a summary of the December, 2000 survey of the Service Water Pond Dams. All movement of the monuments are within the acceptance criteria of 0.04' (½") except the horizontal movement of monument WE-12 of the West Embankment. The displacement of 0.05' is slightly over the acceptance criteria of ½". The applicant claimed such minor fluctuations could be attributed to the survey process, seasonal changes, or ground water conditions.

The inspectors reviewed the FERC inspection reports of 7/27/97 and 2/27/99. The reports concluded that "No conditions were observed that could be considered an immediate threat to the safety of the dams or nuclear facility."

Calculation DC02210-002, "Service Water Pond Dams RG 1.127 Inspection," Revision 0,1/15/96 contains the inspection results of the 1984, 1986, 1990, and 1995 inspections. All results were good. The only findings during the earlier inspection (1984) were weeds & grass growing in the riprap and erosion on the hill that abuts the jetty, the north dam, and the east dam. Later inspection indicated that the findings were resolved.

7. Containment Coating Monitoring and Maintenance Program

The Containment Coating Monitoring and Maintenance Program relies on Engineering Service Procedure (ES)-437, ES-438 & Quality Systems Procedure (QSP)-506 to monitor and maintain the containment coatings. ES 437, "Inspection for Maintenance Rule Structures," Revision 1, 4/19/00 provides the requirement for a visual inspection of all in-scope structures. ES-438, "Containment Inservice Inspection Program," Revision 0. 2/29/00 provides guidance for inservice inspection of the Containment Structure in accordance with the requirements of 1992 Edition with 1992 Addenda of ASME Section XI, Division 1, Subsection IWE/IWL, as modified by NRC 10 CFR 50.55a of 1996. QSP-506,"IWE & IWL Visual Examination," Revision 1, 3/15/00 defines the requirements for visual inspection as defined in ASME, Section XI, Subsection IWE & IWL. Section 8.1 of QSP-506 provides the method to examine the IWE coated steel liner areas and Section 8.4 for examination for the IWL concrete areas including acceptance criteria. Enclosure 10.1 of QSP-506 provides detailed guidance for the concrete survey.

The latest coating inspection was the 2000 IWE inservice examination which found the dome coating deficiencies resulting in the issuance of CER 00-1388 which was requested to be cleaned and re-coated during RF-13 by TWR RW-04586. The inspectors were concerned

about any deficient coating condition may affect the heat removal capacity of the containment sump by blocking the sump screen as described in NRC Generic Letter GL 98-04. The applicant provided the inspectors a letter to the NRC, in response to GL 98-04, dated 11/11/98 stating in Attachment 1 of the letter that the VC Summer containment flow velocity is so low entering the sump screen, the potential net positive suction head drop is only 0.77%. The inspectors also reviewed the NRC SER, stating the NRC considered the licensee's response acceptable. The inspectors concluded that this inspection program has been performing acceptably.

8. Flood Barrier Inspection

The Flood Barrier Inspection program is intended to prevent internal plant flooding only. The only potential external flood would be from the Monticello Reservoir and the North Berm was designed to be the flood barrier such that the reservoir water will not be able to reach the plant. The plant exterior entrances are designed to be higher than the maximum flood level, so that the external flood will not be able to enter the plant.

The internal flood barriers consist of curbs, watertight doors, and penetration seals. Concrete floor barriers are routinely inspected under the Maintenance Rule Structures Program as stated in ES-437 every 5 years. Watertight doors are also fire protection doors and are inspected under the Fire Protection Program. Penetration seals that are also fire barrier penetration seals are inspected in accordance with the STP-728 series every 18 months.

Enclosure 6.6 of FFP-25, "Fire Containment," Revision 3, 12/29/98 specifies:

> Fire doors & penetration seals shall be verified for operability at least each 18 month by performing visual inspection of the expose surface and at least 10% of each type of sealed penetrations.
>
> Each fire door shall be verified for operability by verifying the position of each closed fire door at least once each 24 hours, the proper position of each locked closed fire door at least once each seven days, the proper position of open, release, and closure mechanisms for each closed fire door at least once every 6 months, and verifying that the doors with automatic hold-open and release mechanisms are free of obstruction at least every 24 hours.

The inspectors concluded this program will be able to ensure the operability of the flood barrier doors to perform their intended functions.

9. Service Water Structures Survey Monitoring Program

This program is listed in Section 7.16 of TR00170-003. Due to excessive settlement during construction, semi-annual survey monitoring of the Service Water Pump House (SWPH), Service Water Intake Structure (SWIS), Electrical Duct Banks, and Service Water Intake Line "A" are conducted in accordance with ES-400 to satisfy the requirements of OL condition 2.C.5 and FSAR 2.5.4.10.6.2. Attachment 1 of ES-400 lists the frequency of the survey monitoring. Enclosure 10.1 of CMP-700.001 lists the survey monitoring schedule.

Calculation DC03650-004, "SWPH/SWIS Survey Monitoring Data Review," Revision 12, 11/8/01 contains survey monitoring data from 1991 to 2001 and concludes that the results of

the survey are considered acceptable with no further evaluation required due to fact that the data did not show any appreciable changes.

In Section 4.7.4.3 of the Summer drafted Safety Evaluation Report (SER), the NRR staff concluded that "the applicant has provided an acceptable demonstration, pursuant to 10 CFR 54.21(c)(1)(ii), that, for the Service Water Intake Structure Settlement TLAA, the analyses have been projected to the end of the period of extended operation. The staff also concludes that the FSAR supplement contains an appropriate summary description of the Service water Intake Structure Settlement TLAA evaluation for the period of extended operation, as reflected in the license condition. The above stated conclusions are contingent upon the staff's review of the numerical calculation during the AMR inspections". The inspectors reviewed the numerical calculation contained in Calculation DC03650-004, "Service Water Pump House/Intake Structure Survey Monitoring Data Review," Revision 15, 6/24/03. Page 37 of the calculation lists the semi-annual survey data of the SWPH from 7/19/90 to 1/21/03 and show the vertical displacements are practically no change. Page 52 of the calculation lists the vertical displacement of the SWIS from 1/26/98 to 1/21/03. The difference is 0.02 inches. Survey data for the Electrical Duct Banks and Service Water Intake Line "A" are listed on Pages 53 and 54, respectively. They show the same little or no change results. The inspectors also reviewed Calculation DC03650-011, "SWPH-Secondary Consolidation," Revision 2, 5/7/02 and found the approach reasonable which concluded that further settlement of the SWPH of 1 to 2 inches is possible. The inspectors found these calculations acceptable.

10. Underwater Inspection Program (SWIS and SWPH)

The Underwater Inspection Program is described in Section 7.18 of TR00170-003. This program provides several inspections to manage the loss of materials for corroded steel components and loss of material and change in material properties of concrete components. These inspections are:

> Underwater inspection of the Service Water Intake Structures conducted every 5 years to fulfill OL license condition 2.C.5. This inspection was conducted in accordance with Engineering Service Procedure ES-400 to monitor the conditions of cracks that originated due to earlier settlement.
>
> In order to comply with the applicant's response to GL 89-13, underwater inspection of the Service Water Pump House and the Service Water Intake Structure is conducted to monitor and control corrosion and fouling within the service water system every refueling cycle. This inspection is conducted in accordance with ES-505.

ES-505, "Service Water System Corrosion Monitoring and Control Program," Revision 1, 8/20/99 states that the purpose of this program is to monitor and control corrosion and fouling within the service water system. For fouling, Chemical Procedure CP-622, "Inspection for Corbicula sp. (Asiatic clams) Mytilus sp. (Mussel)," Revision 4, 8/14/96 is used to establish guidelines for various systems using service water for cooling. The procedure provides guidelines to evaluate infestation of Corbicula sp, Mytilus sp, microbiologically induced corrosion (MIC) and silt deposits as specified in IE Bulletin 81-03. The inspectors reviewed the ES-505 inspection report of the1996, 1998, and 2000 refueling outages and only minor corrosion and insignificant deposits of silt were reported. The inspectors also reviewed the CP-622 inspection report of the 1995, 1996, 1998, 1999, and 2000 refueling cycles and learned that only small amounts of mussels were found and cleaned out.

The inspectors reviewed the ES-400 inspection report of 1983, 1988, 1993, and 1998. The 1993 inspection, as documented in Calculation DC03650-003, “Service Water Intake Structure Diver’s Inspection,” Revision 0, 1/9/96 revealed 9 cracks over 0.05" in width and several others with crack width $\leq$ 0.015". The applicant grouted these cracks successfully to prevent water from reaching the rebar to prevent corrosion. The 1998 inspection, as document in Calculation DC03650-005, “Service Water Intake Structure 1998 Diver’s Inspection,” Revision 0, 1998 did not reveal any new cracks and all existing cracks are less than 0.015" in width.

Exit Meeting Summary

The results of this inspection were discussed on August 22, 2003, with members of the applicant staff in an exit meeting open for public observation at the V. C. Summer Nuclear Training Center. The applicant acknowledged the results presented and presented no dissenting comments. The inspectors asked if any of the applicant materials reviewed were proprietary and were told none were proprietary.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Applicant

M. Bedenbaugh, Administration, Nuclear Licensing
S. Byrne, Senior Vice President Nuclear Operations
J. Cadena, Local Government Representative, SCANA
R. Clary, Manager, Manager, Nuclear Licensing
P. Crogen, Nuclear Training Center
S. Crumbo, Senior Engineer
M. Dantzler, Engineer
D. Gatlin, General Manager Nuclear Plant Operations
J. LaBorde, Senior Engineer
K. Nettles, General Manager, Nuclear Support Services
A. Paglia, Supervisor, Plant Life Extension
R. White, Nuclear Coordinator, Santee-Cooper Public Service Authority
R. Whorton, Senior Engineer

NRC

R. Auluck, Senior project Manager
M. King, Resident Inspector
V. McCree, Director, Division of Reactor Projects
M. Widmann, Senior Resident Inspector

Public

M. Gandy, South Carolina Department of Health
and Environmental Control

LIST OF DOCUMENTS REVIEWED

Licensing Documents

Summer Nuclear Plant License Renewal Application, dated 08/06/2002

Summer Updated Final Safety Analysis Report

License Renewal Calculations

DC04000-003, RT for License Renewal, Rev. 0

License Renewal Documents

TR00160-020, Program/Activity Evaluation for License Renewal (Mechanical), Rev. 0 and associated Attachments as follows:

I Above Ground Tank Inspection, Rev. 0,
II Alloy 600 Management Program, Rev. 0
III Boric Acid Corrosion Surveillances, Rev. 0.
IV Bottom Mounted Instrumentation Inspection, Rev. 0
V Buried Piping and Tanks Inspection, Rev. 0
VII Chemistry Program, Rev. 0
VIII Diesel Generator Systems Inspection, Rev. 0
IX Fire Protection Program - Mechanical
X Flow Accelerated Corrosion Monitoring Program
XI Heat Exchanger Inspections
XII Inservice Inspection Plan, Rev.0
XIII Inspections for Mechanical Components
XIV Liquid Waste System Inspection
XV Preventive Maintenance Activities - Ventilation Systems Inspections
XVI Reactor Building Cooling Unit Inspection
XVII Reactor Head closure Studs Program
XVIII Reactor Vessel Internals Inspection, Rev. 0
XIX Reactor Vessel Surveillance Program, Rev. 0
XX Service Air System Inspection, Rev.0
XXI Service Water System Reliability and In Service Testing Program
XXII Small Bore Class 1 Piping Inspection, Rev. 0
XXIII Steam Generator Management Program, Rev. 0
XXIV Waste Gas System Inspection, Rev. 0
XXV Preventive Maintenance Activities - Terry Turbine, Rev. 0,

TR-00140-002, Fatigue Evaluations for License Renewal, Rev. 0

TR00170-003, Structures Aging Management Review for License Renewal, Rev. 0

7.1 10 CFR 50 Appendix J General Visual Inspection
7.2 10 CFR 50 Appendix J Leak Rate Testing
7.3 ASME Section XI ISI Program - IWF
7.4 Battery Rack Inspection
7.8 Containment Coating Monitoring and Maintenance Program
7.9 Containment ISI Program - IWE/IEL
7.10 Fire Protection Program
7.11 Flood Barrier Inspection
7.12 Maintenance Rule Structures Program
7.13 Material Handling System Inspection Program
7.14 Pressure Door Inspection Program
7.15 Service Water Pond Dam Inspection Program
7.16 Service Water Structures Survey Monitoring Program
7.17 Tendon Surveillance Program
7.18 Underwater Inspection Program

Existing Plant Procedures and Programs

ES-401, Evaluation of Operational Cycles and Transients, Rev. 2

HPP-832, RCS Leak Rate Calculation Using Xenon, Rev. 0

ARP-001-XCP-615, Annunciator Response for Point 3-6, RCS Leak Det, Rev. 6, Change D

STP-211.001, Reactor Vessel Surveillance Specimen Removal and Examination, Rev. 6

GTP-304, Inservice Inspection System Pressure Testing Second Ten Year Interval, Rev. 10

ISE-3, ASME Section XI Inservice Examination Manual for 2nd Inspection Interval, Rev. 2

Surveillance Test Procedure (STP) 250.001A, Reactor Coolant System Leakage/Pressure Test, Rev. 0

Mechanical Maintenance Procedure (MMP) 100.003, Application of Coating for embedded Pipe, Rev. 4

Civil Maintenance Procedure (CMP) 400.001, Excavation, Backfill, and Earthwork, Rev. 5

Station Administrative Procedure (SAP) 401, Secondary Chemistry Program, Rev. 9

SAP 402, Primary Water Chemistry Program, Rev. 4

Chemistry Procedure (CP) 632, Corrosion Control of Secondary Systems, Rev. 3

MMP-300.015, Turbine Maintenance - Emergency Feedwater Pump, Rev. 12

General Maintenance Procedure (GMP) 100.020, Component Leakage Assessment, Rev. 5

STP-501.003, Battery Service Test, Rev. 10

STP-505.003, 18 Month FP Diesel Battery Test, Rev. 3

SAP-1100. Boric Acid Corrosion Control Program, Rev. 0 (draft)

Quality Systems Procedure (QSP) 216, Boric Acid Corrosion Inspection, Rev. 0 (draft)

MMP-500.009 Reactor Vessel Closure Head Tension/Detension, Rev. 10

MMP-165.010, Spent Fuel Pit Bridge Crane Maintenance, Rev. 7 (TYPICAL)

ES-505, Service Water System Corrosion Monitoring and Control Program, Rev. 1A

SAP-1255, Service Water Reliability Optimization Program, Rev. 0

ES-560.211, Service Water System Heat Exchanger Performance, Rev. 8A

CP-923, Service Water Chemical Addition Program, Rev. 1

CP-622, Inspection for Corbicula Mytilus, Rev. 4

SAP-601, Application, Scheduling, and Handling of Maintenance Activities, Rev. 11

ES-421, Flow-Accelerated Corrosion Program, Rev. 4

MMP-460.007, Inspection/Repair/Replacement of Enclosure Bags and Flex Pipe, Rev. 2 (TYPICAL)

STP-207.002, Inspection of Containment, Rev. 5

STP-206.001, Integrated Leak Rate Test, Rev. 3

GTP-315, Containment Leakage Rate Testing Program, Rev. 2

ES-438, Containment Inservice Inspection Program, Rev. 0

SP-228, Surveillance of Reactor Building Post Tension System, Rev. 12

STP-160.001, Containment Tendon Test, Rev. 4

QSP-506, IWE and IWL Visual Examination, Rev. 0

ES-437, Inspection for Maintenance Rule Structures, Rev. 1

ES-400, Service Water Pond Dam Inspection Program, Rev.

CV-01, Survey Monitoring Data Review, Rev. 0

CMP-400.001, Excavation, Backfill, and Earthwork, Rev. 5, Section 5

FPP-025, Fire Containment, Rev. 3

ES-305 EQ Process and Control, Rev. 0

ES-112 Control and Maintenance of the Equipment Qualification Data Base and Instrument Loop Insulation Resistance Calculation, Rev. 1

ES-504 Equipment Aging and Performance Trending Rev. 4

CMP-700.012 Embedded Pull Box Inspection, Rev. 0

CMP-700.013 Inspection of Electrical Manholes, Rev. 0

Plant Data/Results

CB15053, 2002 Yearly Review of Cycle Count from WESTEMS, dated 01/07/2003

REP-107.016, Incore Flux Thimble Wear Assessment, Rev. 0

STP-250.001, RCS Leak Test, performed 5/31/02

TR0551-002, Flow-Accelerated Corrosion Program Post Outage Summary Report, Rev.0. Attachment IV, Preliminary FAC Sample Selection Plan for RF14

Calculation DC03650-11, SWPH - Secondary Consolidation

Calculation DC03650-04, SWPH/SWIS Structure Survey Monitoring Data Review, Rev. 2

Calculation DC02210-002, Service Water Pond Dams RG 1.127 Inspection, Rev. 0

Calculation DC02210-001, Service Water Pond Dams Inspection

Miscellaneous Documents

RC-02-0160, Response to NRC Bulletin 2002-002, Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs, dated 09/12/2002

RC-03-0016, 60 Day Response to NRC Bulletin 2002-001, dated 01/24/2003

Correspondence regarding the RCS A Loop cracked weld: RC-00-0377 (12/29/2000), RC-01-0010 (01/09/2001), RC-01-0019 (01/16/2001), RC-01-0033 (02/09/2001), RC-02-0068 (04/17/2002), RC-02-0088 (05/04/2002), RC-02-0094 (05/13/2002), and RC-02-0108 (06/21/2002)

Work Order 0205178, Reactor Vessel Head Inspection Refueling 13, dated 06/02/2002

CER 02-1189, Traces of boric acid found on Reactor Vessel Head

CER 00-1392, Crack in Weld Between Hot Leg Piping and the Reactor Vessel

QA–AUD-200210-0, ISI Program Audit, dated October 25, 2002

Technical Report (TR) 1007461, Terry Turbine Maintenance Guide, AFW Application, November, 2002

Engineers Technical Work Record 15517, Inspection of DG Fuel Oil Tanks and Piping, performed 9/5/99

Engineers Technical Work Record WW 15142, NCN 00-1470 - Disposition # 12, “A” CCW Heat Exchanger Tube Sheet Pitting

ASM Handbook, Volume 13, Corrosion, April, 1998, “Corrosion of Alloy Steels”

Self-Assessment Report SA03-SE-01, Boric Acid Corrosion Program, performed March 31-April 3, 2003

Condition Evaluation Report (CER) 0-C-00-1676, Inadequate Procedure for Boric Acid Inspection, 11/3/2000

Drawing 1-MS-17-101, Condensate Storage Tank (CST), Rev. 3

1-MS-17-090-01, CST - VC Summer Foundation Plan, Rev. A2

1-MS-17-090-2, CST - VC Summer, Foundation - Valve Pit, Rev. B

American National Standard Institute (ANSI) B30.2.0 - 1976, Overhead and Gantry Cranes

NUREG-0612, Control of Heavy Loads at Nuclear Power Plants

ES-450, Attachment III, Engineering Information Request, “Sample Selection Plan” dated 4/18/2002

Flow-Accelerated Corrosion Program Self Assessment Report, SA03-DE-04, 5/19/2003 - 5/21/2003

DBD Reactor Building, Section 4.1.2.4.1

Draft Document - Fire Protection Program Post Renewal AMP Implementation Package

ATTACHMENT 2

VIRGIL C. SUMMER NUCLEAR STATION

LICENSE RENEWAL INSPECTION PLAN

AGING MANAGEMENT PROGRAMS SELECTED FOR INSPECTION

Thermal Fatigue Management Program
Environmental Qualification (EQ) Program
Tendon Surveillance Program
In-Service Inspection (ISI) Plan
Chemistry Program
Reactor Head Closure Studs Program
Boric Acid Corrosion Surveillances
Alloy 600 Aging Management Program
Reactor Vessel Internals Inspection
Flow - Accelerated Corrosion Monitoring Program
Steam Generator Management Program
Service Water System Reliability and In-Service Testing Program
Material Handling System Inspection Program
Fire Protection Program
Chemistry Program
Reactor Vessel Surveillance Program
Above Ground Tank Inspection
Diesel Generator Systems Inspection
Liquid Waste System Inspection
Reactor Building Cooling Unit Inspection
Service Air System Inspection
Small Bore Class 1 Piping Inspection
Waste Gas System Inspection
Heat Exchanger Inspections
Buried Piping and Tanks Inspection
Non-EQ Insulated Cables and Connections Inspection Program
Containment ISI Program - IWE/IWL
ASME Section XI ISI Program – IWF
10 CFR 50 Appendix J General Visual Inspection
10 CFR 50 Appendix J Leak Rate Testing
Maintenance Rule Structures Program
Service Water Pond Dam Inspection Program
Containment Coating Monitoring and Maintenance Program
Bottom-Mounted Instrumentation Inspection
Battery Rack Inspection
Flood Barrier Inspection
Pressure Door Inspection Program
Service Water Structures Survey Monitoring Program
Underwater Inspection Program (SWIS and SWPH)
Inspections for Mechanical Components
Preventive Maintenance Activities- Ventilation Systems Inspections
Preventive Maintenance Activities - Terry Turbine

ATTACHMENT 3

LIST OF ACRONYMS USED

AMP	Aging Management Program
AMR	Aging Management Review
ASME	American Society of Mechanical Engineers
CER	Condition Evaluation Report
CST	Condensate Storage Tank
DG	Diesel Generator
ECCS	Emergency Core Cooling Systems
ECT	Eddy Current Testing
EQ	Environmental Qualification Program
FAC	Flow Accelerated Corrosion
FERC	Federal Energy Regulatory Commission
IA	Instrument Air
IR	Insulation Resistance
ISI	Inservice Inspection Program
LR	License Renewal
LRA	License Renewal Application
MH	Man Hole
NRR	NRC Office of Nuclear Reactor Regulation
QSP	Quality Systems Procedure
RAI	Request for Additional Information
RCS	Reactor Coolant System
RB	Reactor Building
RBCU	Reactor Building Cooling Units
RG	Regulatory Guide
RT	Reference Temperature
RV	Reactor Vessel
RVH	Reactor Vessel Head
SBO	Station Blackout Event
SCE&G	South Carolina Electric and Gas
SER	Safety Evaluation Report
SR	Safety Related
SSC	Systems, Structures, and Components
SW	Service Water System
SWIS	Service Water Intake Structure
SWPH	Service Water Pump House
TLAA	Time Limiting Aging Analysis
TR	Technical Report
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Test
VCSNS	Virgil C. Summer Nuclear station
WR	Work Request