



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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July 31, 2003

Carolina Power & Light Company
ATTN: Mr. J. W. Moyer
Vice President
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3581 West Entrance Road
Hartsville, SC 29550

**SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT - NRC INSPECTION REPORT
50-261/03-09**

Dear Mr. Moyer:

On June 27, 2003, the NRC completed an inspection regarding the application for license renewal for your Robinson facility. The enclosed report documents the inspection findings, which were discussed on June 27, 2003, with you and other members of your staff in an exit meeting open for public observation at the Hartsville Memorial Library.

The purpose of this inspection was an examination of activities that support the application for a renewed license for the Robinson 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).

CP&L

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

Sincerely,

\ RA by Harold O. Christensen\

Charles A. Casto, Director
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Docket Nos.: 50-261
License Nos.: DPR-23

Enclosure: NRC Inspection Report 50-261/03-09

cc w/encl: See page 3

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No: 50-261

License No: DPR-23

Report No: 50-261/03-09

Licensee: Carolina Power and Light Company (CP&L)

Facility: H. B. Robinson Steam Electric Plant, Unit 2

Location: 3581 West Entrance Road
Hartsville, SC 29550

Dates: June 9 - 27, 2003

Inspectors: R. Moore, Reactor Inspector
M. Scott, Reactor Inspector
K. Van Doorn, Reactor Inspector
H. Wang, Operations Engineer, NRR

Approved by: Caudle Julian
Team Leader
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SUMMARY OF FINDINGS

IR 05000261-03-09; 6/9-27/2003; Carolina Power and Light Company, H. B. Robinson Steam Electric Plant, Unit 2. 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.

Documentation from the existing aging management programs was of good quality, thorough, and retrievable. An exception was that the System Engineer's System Walkdown Procedure, TMM-104, Revision 12, contained no reference to the Boric Acid Corrosion Program Procedure, PLP-040, or directions for initiation of a work request when evidence of RCS leakage is identified.

The inspectors observed that the applicant had not yet established adequate tracking items in the established plant Action Request data base to assure future implementation of proposed actions to support LR, although the applicant had established a generally thorough task list data base within the LR group. The LR group task list needs to be integrated into the established plant Action Request system to ensure that future actions are accomplished as planned. The lack of integration of future tasks into the established site Action Request system had been previously identified via an applicant audit of the LR program. Completion of this integration was identified as an item for further NRC review during a future inspection.

NRC inspectors examined a substantial portion of plant safety related equipment and found no significant adverse conditions. The NRC's overall conclusion was the material condition of the plant was being adequately maintained.

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:

- Residual Heat Removal System
- Component Cooling Water System
- Service Water System
- Auxiliary Feedwater System
- Control Room HVAC
- Emergency Diesel Generator
- EDG room CARDOX System
- EDG Fuel Oil System
- Dedicated Shutdown Diesel
- Fire Protection Equipment
- Electrical Distribution System
- Switchyard
- Intake Structure
- Lake Robinson Dam

B. Review of Mechanical Aging Management Programs

1. Fatigue Monitoring Program

The Fatigue Monitoring 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 plans to enhance the program to reduce the number of load/unload transients allowed and add the Steam Driven Auxiliary Feedwater Pump tests to the cycle count list. In addition, the applicant plans to conduct inservice inspections of the pressurizer surge line to confirm that Environmentally Assisted Fatigue has not resulted in cracking. The program provides for evaluation of actual fatigue cycles, e.g. heat up and cool down, which the plant

experiences and to confirm these cycles will not exceed the design cycles assumed in the fatigue analysis.

The inspectors reviewed the License Renewal Calculation which described program requirements, the associated plant procedure, the UFSAR, Technical Specifications, recent plant data, and portions of the long term Inservice Inspection (ISI) plan. In addition, the inspectors held discussions with site program owners in this area. The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. When implemented as described, there is reasonable assurance that the intended function of the Reactor Coolant System (RCS) pressure boundary components and piping will be maintained through the period of extended operation.

The inspectors observed that the applicant had not yet established adequate tracking items in the established plant Action Request data base to assure future implementation of proposed actions to support LR, although the applicant had established a generally thorough task list data base within the LR group. However, this data base did not contain the action to update the transient list to include the SDAFW tests. The LR group task list needs to be integrated into the established plant Action Request system to ensure that future actions are accomplished as planned. The lack of integration of future tasks into the established site Action Request and the incomplete LR data base was a general condition concerning all LR actions to be completed and had been previously identified via an applicant audit of the LR program. Completion of this integration was identified as an item for further NRC review during a future inspection.

2. Nickel-Alloy Nozzles and Penetrations Program

The Nickel-Alloy Nozzles and Penetrations Program is a new program credited in the LRA as an aging management program for stress corrosion cracking in all Nickel-Alloy RCS components including the Reactor Vessel Head (RVH) and internals. The applicant plans to maintain involvement in ongoing industry initiatives and plans to utilize the ASME Section XI program for evaluation and repair/replacement of components. The applicant has conducted RVH inspections such as those required by NRC via recent Bulletins. This has included two bare metal head visual inspections and nondestructive examinations. The applicant plans to replace the RVH during Refueling No. 23 (the plant is currently in cycle 22). In addition, the applicant plans to submit the final program to NRC for approval prior to the end of the current license period. The applicant has not identified leaks through the RVH to date. Note: The RVH inspections are the subject of ongoing inspections (see NRC Report No. 50-261/2002-001).

The inspectors reviewed the applicable calculation, reviewed the applicant NRC Bulletin responses which included inspection results, and held discussions with applicant personnel responsible for the inspections. The inspectors concluded that the Nickel-Alloy Nozzles and Penetrations Program enhancements to reflect current industry experience, and updating of programs and associated documents is planned, although, as previously discussed, was not yet tracked in the applicant's Action Request data base. Adequate historic reviews to determine aging effects had been conducted. When implemented as described, there is reasonable assurance that the intended function of Nickel-Alloy Nozzles and Penetrations 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 irradiation embrittlement. The applicant also imposes temperature/pressure limits on plant operations. The applicant has recently calculated the projected degree of reduction of Upper Shelf Energy and Pressurized Thermal Shock Reference Temperature confirming that all requirements will continue to be met for the 60 year proposed license period.

The inspectors reviewed the applicable calculations, site procedures, and capsule test results. 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. PWR Vessel Internals Program

The PWR Vessel Internals (RVI) Program is a new program credited in the LRA as an aging management program for cracking, reduction in fracture toughness, loss of pre-load, and changes in dimensions due to void swelling for the RVI. This program will also provide screening criteria to determine the susceptibility of cast austenitic stainless steel parts to thermal embrittlement. The program is meant to supplement the RVI inspections required by the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program. The applicant has credited the chemistry program for prevention of Stress Corrosion Cracking. For other aging effects the applicant plans to stay involved with ongoing industry research to further characterize aging mechanisms and implement the necessary inspections. The applicant plans to submit inspections plans to the NRC 24 months prior to implementation of the augmented inspections.

The inspectors reviewed the applicable calculation and held discussions with responsible personnel. The inspectors noted that the requirement to submit the proposed inspections had not yet been captured in the LR group action item data base. This was considered an item for future NRC followup. The inspectors concluded that the PWR Vessel Internals Program is planned and the applicant is appropriately involved with industry initiatives to assure an adequate program will be initiated.

5. Steam Generator Tube Integrity Program

The Steam Generator Tube Integrity 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 calculation and the plant inspection procedure. In addition the inspectors discussed the program with responsible applicant personnel. Note: Steam Generator inspections are the subject of ongoing inspections by NRC (see NRC Report 50-261/2002-04 for documentation of a recent inspection).

The inspectors concluded that the Steam Generator Tube Integrity Program was in place, had been implemented, and included the elements and components identified 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 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. ASME Section XI, Subsection IWB, IWC, and IWD Program (ISI)

The ISI program is an existing program credited in the LRA for managing cracking, loss of pre-load, 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 program covers selected safety-related systems and components including Reactor Vessel and Internals, Reactor Coolant, Chemical and Volume Control, Safety Injection, and Steam Generators.

The inspectors reviewed the applicable calculation, reviewed applicable procedures, reviewed Reactor Coolant pressure test results, and conducted a general review of ISI results with responsible applicant personnel. Note: The ISI program is the subject of ongoing inspections by NRC (see NRC Report 50-261/2002-04 for documentation of a recent inspection).

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. Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program

The CASS program is a proposed new program credited in the LRA for monitoring the effects of reduction in fracture toughness due to thermal embrittlement of CASS components within Class 1 boundaries. The applicant's analyses have shown that no additional inspections are warranted for piping, fittings, and valves and that the ongoing surface inspections for Reactor Coolant pump casings performed under the ISI program are sufficient. Reactor Vessel Internals CASS components are covered by the PWR Vessel Internals Program.

The inspectors reviewed the applicable calculation, reviewed vendor analysis of CASS components, and held discussions with applicant personnel. The inspectors concluded that the CASS components and piping have been appropriately evaluated for adequacy of ongoing inspections which provides reasonable assurance that CASS materials will be appropriately monitored during the extended operating period.

8. Flux Thimble Eddy Current Inspection Program

This program is an existing program which assures periodic inspections in response to 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.

The inspectors reviewed the applicable calculation, reviewed the applicable plant procedure, reviewed the latest inspection results, and held discussions with responsible applicant personnel. The inspectors concluded that the Flux Thimble Eddy Current Inspection Program was in place, had been properly implemented, and was consistent with the description in the LRA. Continuing

implementation of this program provides reasonable assurance that the flux thimble tubes will be adequately inspected.

9. 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 (MRP-003 and TMM-38). 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 calculation (RNP-L/LR-0619) were accurately portrayed and that they had been dispositioned properly. There was one wear issue in the early 1990s. The inspectors were satisfied with the existing procedures or 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 SSCs will be maintained through the period of extended operation.

10. Inspection of Overhead Heavy and Light Load Handling Systems Program

The applicant has a number of important cranes in their existing maintenance rule (MR) inspection program. The cranes in the MR program were included in the program under license renewal. Under the application documentation for life extension, the applicant is planning on adding the Turbine Building Gantry crane to the list to be inspected to be consistent with the Gall report. The applicant has initiated a change to the existing walkdown and inspection procedure regarding heavy and light load equipment. Visual inspections will be performed as indicated in calculation RNP-L/LR-0628. The inspectors reviewed a draft of the subject procedure (TMM-104). This procedure change should reference or be linked to the existing Preventive Maintenance (PM) procedures (PM-127, 130, 131, and 132), and MMM-009 when the change is completed. With the change, the inspectors concluded that the applicant will provide 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.

11. Close-Cycle Cooling Water System Program

The applicant has two closed cycle systems that were included in this program. These were the component cooling water (CCW) and the emergency diesel generator (EDG) cooling systems both of which are cooled by the open cycle system discussed below. CCW and EDG coolant contain a chromate mixture that prevents bacterial growth and inhibits corrosion of the metal of the closed systems. CCW cools components such as the high head injection pumps' bearings and the RHR heat exchangers, while the EDG cooling cools the EDG engine and engine oil. The inspectors reviewed the existing chemistry procedures that maintain fluid chemistry and reviewed data from the past year for data trends. The procedures reference the Electrical Power Research Institute guidance used throughout the industry. 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.

12. Open Cycle Cooling Water System Program

The applicant has a number of programs to manage, sample, and maintain the Open Cycle Cooling Water System, the Service Water System (SW), and associated interfacing system points. The SW flows cooling water from Lake Robinson 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 April 2002 (NRC inspection report 50-261/2002-002) and found acceptable at that time. As an enhancement, the applicant was planning to write a PM item to replace the safety related pump room cooling coils on repetitive basis. Routinely, the plant engineering personnel had been replacing the coils on a three-year periodicity to account for coil tube wall loss. The PM action was to ensure routine nature of the replacement would continue. Plant engineering was considering other possibilities for the enhancement such as replacement of the 90 percent copper coils with stainless steel coils. With the enhancement, the inspectors concluded that the applicant will provide 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.

13. 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 program and the FAC engineer review 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. As seen in the most recent NRC inspections (last NRC inspection report was 50-261/2002-004), the existing program appeared complete and functioning.

The AMP Implementing Documents data base maintained by the license renewal personnel tracked potential changes to the programs. The data base indicated that there were five pending changes or enhancements to the program procedure. Per discussions with the FAC engineer, these changes were on track for implementation within a short period with minor exceptions. Instead of taking wall measurement on valve bodies, the engineer was determining that measurement of pipe wall thickness just downstream of a given valve may be more meaningful.

With the enhancements, the inspectors concluded that the applicant will provide 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.

14. One Time Inspection Program

This to-be-written program is to perform one time checks that existing and plant specific programs are effective in accomplishing their goal of plant long term maintenance on specific components or systems. The systems or components are listed in program document L/LR-0632 and the inspections will consist of: SW/CCW heat exchanger tubes; miscellaneous piping such as feedwater, condensate, etc; small bore RCS piping; diesel generator exhaust silencers; reactor containment moisture barrier; containment liner plate; and diesel fire pump fuel oil tank wall thickness. The applicant has included these future actions in their AMP Implementing Documents data base. During the last outage, the applicant had performed some initial heat exchanger tube eddy current inspections and were planning the other future inspections. The tubes had been replaced in 1990 and had an expected life of at least 20 years. The inspectors discussed the initial results with the system engineer. The inspectors walked down the diesel generator exhaust and found no external problems. The applicant had made some initial attempts at inspecting the interior of the EDG silencers and were working out the details for future effort. The inspections of the containment moisture barrier and liner are scheduled to be completed by 2005. The general containment is inspected regularly (ASME IWL discussed elsewhere in this report). With the additional inspections, the inspectors concluded that the applicant will provide adequate planned guidance to ensure the aging effects will be appropriately assessed and managed. There is reasonable assurance from their preliminary activities that the intended function of the SSCs will be maintained through the period of extended operation.

15. 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 reviewed and approved by the NRC. 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 applicants' AMP document, RNP-L/LR-0618. 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.

16. Bolting Integrity Program

This license renewal AMP described in document RNP L/LR-0625 monitors attributes on bolting for numerous components. It relies on other programs to perform inspections. These include ASME Section XI, Subsection IWB, IWC, and IWD (AMP L/LR-0606). The boric acid wastage program inspects for chemical attack. The license renewal enhancement to this program is that bolting requirements and inspections for the reactor coolant pump cover to casing bolts will be picked up in the PM AMP. Additionally, a precautionary statement regarding the use of molybdenum sulfide would be added to the site's bolting procedure. These enhancements were found in the Applicant's tracking AMP Implementing Documents data base. This AMP does not address bolting covered by ASME Code Section XI, SubSection IWF (Supports, see above) and structural supports (see that AMP discussion). Boric Acid corrosion is discussed in the Boric Acid AMP section.

With the future changes, the inspectors concluded that the applicant will provide 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.

17. Systems Monitoring Program

The Systems Monitoring program is a site specific program that utilizes an existing procedure to walk down systems delineated in the maintenance rule. The system engineers perform periodic walk down inspections of their assigned systems and generate a health report. The applicant examined the existing program and has brought into the process other systems to be inspected and enhancements. The systems brought in were outside of the MR and included the steam generator blowdown, extraction steam, and the auxiliary boiler/steam systems. The enhancements included inspections for aggressive chemical attack (e.g., chemical species on the floor or in a nearby area), abrasive wear (e.g., flexible collars between ducts and fans), and provide guidance for the inspection of seismic continuity piping/components. The applicant had a draft change to the walkdown procedure that was in an internal review process during the inspection period. The inspectors talked with the system engineers about the existing process and determined from a sample of reports on the systems and system wide inspections that the process appeared to be working. With the enhancements, the inspectors concluded that the applicant will provide 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.

18. Above Ground Carbon Steel Tanks Program

This is an existing program which manages the aging effects of loss of material for exterior surfaces of above ground tanks in the fuel oil system. The program includes preventive measures to mitigate corrosion by protecting the external surface of carbon steel components with protective paint or coating and with sealant or caulking at the interface with soil or concrete. Visual inspections during periodic system walk downs are performed to monitor degradation of the protective paint, coating, caulking or sealant. For tanks in contact with the ground a cathodic protection system is provided. This program will be enhanced prior to the period of extended operation. The administrative controls for the program will be revised to formalize the requirement that the external surfaces of fuel oil tanks are to be inspected periodically and to incorporate corrective action requirements.

The inspectors reviewed the program documentation, discussed the program with the responsible station personnel, reviewed documentation of previous tank inspections, and observed the present condition of the above ground tanks. The calculation which documented this aging management program, RNP-L/LR-0630, Above Ground Carbon Steel Tanks Program, Rev. 1, identified the procedures which implement this program and the enhancements required for license renewal. Additionally, the enhancements and applicable procedures were listed in the license renewal task database.

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.

19. Selective Leaching of Materials Program

This is a new program for managing the potential loss of material due to selective leaching. The program includes mechanical testing of selected components that may be susceptible, to determine whether loss of materials is occurring and whether this process will affect the ability of the components to perform their intended function for the period of extended operation. The program will include a one time inspection and mechanical test of a sample component selected from a list of susceptible components.

The inspectors reviewed the program documentation and discussed the program implementation with responsible station personnel. This aging management program is described in calculation RNP-L/LR-0633, Selective Leaching of Materials Program, Rev. 1, which describes the required program activities and includes a list of components susceptible to selective leaching. Additionally, the action to develop procedures for this program was entered into the license renewal task database.

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 identification of potential selective leaching.

20. Boric Acid Corrosion Program

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 structures and components. The program uses leakage detection and periodic visual inspections to identify and manage boric acid corrosion. Leakage detection is accomplished by daily Reactor Coolant System leakage calculations and periodic inspections. Visual inspections are accomplished by pre- and post-refueling outage inspections and system walk down inspections by system engineers.

The inspectors reviewed the program documentation, discussed the program with the responsible station personnel, reviewed documentation of past boric acid walk down inspections, reviewed station implementing procedures for the program, and reviewed documentation which resolved boric acid residues identified in the plant. The inspectors noted that the System Engineer's System Walkdown Procedure, TMM-104, Revision 12, included a walkdown radiological guideline regarding boric acid on floor or equipment; however, there was no reference to the Boric Acid Corrosion Program Procedure, PLP-040, or directions for initiation of a work request when evidence of RCS leakage is identified. The applicant provided the inspectors with an audit finding related to this issue from a previous corporate assessment of the boric acid program (document AR-68113, dated August 2002). The corporate assessment identified that the linkages/references between the plant procedures and the Boric Acid Corrosion Program documents were inconsistent or weak and Robinson Procedure TMM-104 was specifically noted.

The calculation which documented this aging management program, RNP-L/LR-0601, Boric Acid Corrosion Program, Rev. 1, identified the procedures which implement this program and the enhancements required for license renewal. No changes to TMM-104 were discussed in the calculation, application, or listed in the license renewal task data base related to the Boric Acid Corrosion Program. Following discussion of this issue with the inspectors, the applicant revised the Boric Acid Corrosion Program aging management calculation to include the results of the NRC and corporate audit issue regarding the deficient linkage between the corrosion program documents and implementing procedures such as procedure TMM-104.

The inspectors concluded that the applicant had conducted adequate historic reviews of plant specific and industry experience information to determine aging effects. When the planned enhancements are implemented, there is reasonable assurance that the program will successfully manage boric acid corrosion.

21. Buried Piping and Tanks Surveillance Program

This is an existing program which manages the aging effects of loss of material due to galvanic, general, pitting and microbiological induced corrosion (MIC) for buried portions of the Fuel Oil System and bottoms of above ground fuel oil tanks. There are no buried tanks in this program. An impressed current, Cathodic Protection System, provides protection for this equipment. Periodic surveillance is performed to assure adequate functioning of the system. Additionally, pressure testing of a portion of the underground piping will be accomplished to identify leaks. Prior to the period of extended operation, the program will be enhanced to upgrad the Cathodic Protection System procedures to ensure consistency with more recent industry guidance and provide the capability to pressure test additional portions of in-scope piping. This program works in conjunction with the Buried Piping and Tanks Inspection Program to manage the aging effects of fuel oil piping and tanks.

The inspectors reviewed the program documentation, discussed the program with responsible applicant staff, observed performance of periodic maintenance which monitored the cathodic system function, and reviewed data sheets from previous surveillance performances. This aging management program is documented in calculation RNP-L/LR-0629, Buried Piping and Tanks Surveillance Program, Revision 0, which identified the procedures implementing this program and the enhancements required for license renewal. The specific documents and associated enhancements were listed in the LR task data base.

The inspectors concluded that 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 SSCs will be maintained through the period of extended operation.

22. Buried Piping and Tanks Inspection Program

This existing program manages the aging effect of loss of material due to crevice, general, MIC, pitting, and galvanic corrosion for in-scope components in the Fuel Oil, Service Water and Onsite Fire Protection systems. There are no buried tanks in this program. Preventive measures to mitigate corrosion were provided by protecting external surfaces of buried piping and components by 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 to require coating inspections when in-scope equipment is exposed, ensure backfill does not damage coatings, and require the use of a coatings engineer to inspect and evaluate coatings and degradation.

The inspectors reviewed the program documentation, discussed the program with responsible applicant staff, and reviewed the Station Qualification Guide (ESG0023R) for a coatings engineer. This aging management program is documented in calculation RNP-L/LR-0634, Buried Piping and Tanks Inspection Program, Revision 1, which identified the procedures implementing this program and the enhancements required for license renewal. The specific documents and associated enhancements were listed in the LR task data base.

The inspectors concluded that 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 SSCs will be maintained through the period of extended operation.

23. Water Chemistry Program

This is an existing program which is credited for mitigating the aging effects of loss of material due to erosion, fretting, crevice, general, galvanic, 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 calculation RNP-L/LR-0600, Water Chemistry Program, Revision 5.

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.

24. Fuel Oil Chemistry Program

This is an existing program credited for managing the aging affects of loss of material due to crevice, general, MIC, and pitting corrosion of the internal surfaces in fuel oil tanks and components. The program relies on a combination of surveillance and maintenance procedures to minimize or prevent exposure of fuel oil to contaminants such as water and microbiological organisms by periodic inspection and cleaning of tanks. Prior to the period of extended operation, the program will be enhanced to improve sampling and de-watering of tanks, formalize sample bacteria testing, and to incorporate quarterly trending of fuel oil chemistry parameters.

The inspectors reviewed the program documentation, discussed the program with the Chemistry department staff and reviewed chemistry sampling procedures and acceptance criteria, The aging management program is documented in calculation RNP-L/LR-0631, Fuel Oil Chemistry Program, Revision 2, which identified the procedures implementing this program and the enhancements required for license renewal. The specific documents and associated enhancements were listed in the LR task data base.

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 enhanced, there is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

25. Preventive Maintenance Program

This is an existing program that manages the various aging effects for a wide range of components. The program includes preventive, mitigative and monitoring activities which provide periodic refurbishment, replacement, inspection and testing to identify and assess potential degraded conditions. Inspection and testing activities monitor various parameters including surface condition, loss of material, presence of corrosion products, and signs of cracking. The current guidelines for these activities may not specifically describe the aging effects applicable to LR but will be enhanced to include the aging effects/mechanisms identified in the aging management reviews.

The inspectors reviewed the program documentation, discussed the program with the responsible station staff, reviewed PM procedures and schedules, reviewed self assessments and audits of the PM program, and resolution of findings. The aging management program is documented in calculation RNP-L/LR-0642, Preventive Maintenance Program, Revision 5, which identified the procedures implementing this program for in-scope equipment, and the enhancements required for license renewal. The specific documents and associated enhancements are listed in the LR task data base.

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 enhanced, there is reasonable assurance that the intended function of the SSCs will be maintained through the period of extended operation.

26. Fire Protection

The inspectors reviewed calculations RNP-L/LR-0612, Fire Protection Program, Rev. 4 and RNP-L/LR-0611, Fire Water System Program, Rev. 4. These AMPs are patterned after sections X1.M26 and X1.M27 of the GALL report. To judge past program performance the inspectors reviewed the records of the last three surveillances for all the fire protection equipment included in the program. No significant discrepancies were identified in these records.

C. Review of Electrical Systems Aging Management Programs

1. Electrical Equipment AMPs

Aging management programs for electrical equipment have yet to be developed. 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 applicant has agreed to develop a new program will perform periodic visual inspections of non-EQ cables and connections. The inspectors reviewed calculation RNP-L/LR-0392, Scoping of PVC Insulated Cables for License Renewal, Rev. 0. The document identifies non-EQ PVC insulated cables to be placed in the inspection program. The inspectors reviewed document EGR-NGGC-0507, Cable Aging Management Program, Rev. 0. The document described the program in general but the actual program has yet to be developed. The inspections will look for adverse localized equipment environments caused by heat or radiation which can accelerate aging of these electrical components. The inspections are to be performed with a 10 year frequency and the first inspection will be performed before the end of the initial 40 year license period.

The inspectors reviewed calculation RNP-L/LR-0390, Aging Management Review of Electrical Commodities for License Renewal, Rev. 0. This document commits to develop new AMPs in the future for bus duct, fuse holders, high range radiation monitors and neutron monitoring instrumentation cable. The AMP for radiation monitors will use the techniques described in section X1.E2 of the Gall report, i.e. trend the results of routine calibration tests required by technical specifications for these circuits to attempt to detect aging degradation of the cables and connectors. For neutron monitoring instrumentation cables the document commits to develop a periodic test for the cables. The inspectors reviewed the documents and found them acceptable for the early stage of development of these programs.

2. Electrical Manholes

At Robinson power, instrumentation and control electrical cables 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 manholes, and the inspectors observed there was no water present and equipment conditions were satisfactory. The inspectors inquired about a program to periodically inspect manholes for water. The applicant stated that do not currently have a scheduled program to inspect electrical manholes. The inspectors stated it is a good practice to have routine program to inspect manholes and pump if needed.

D. Review of Structural Component Aging Management Programs

1. Structures Monitoring Program

The Structures Monitoring Program (SMP) is credited for aging management of all civil structures and structural components within the scope of license renewal at Robinson Unit 2 other than the Reactor Containment Structure. The applicant also considers that the SMP is consistent with the GALL program XI.S6 - Structures Monitoring Program. The program description is contained in Calculation RNP-L/LR-0608, "Structures Monitoring Program," Revision 1, 3/3/03.

The SMP uses industry standard ACI 349.3R-96 to monitor concrete structures and ASCE 11-90 to monitor steel structures similar to that recommended by the GALL program. The inspection method is visual inspection and the frequency of inspection is every ten years. ACI 349.3R-96 states that the inspection frequency should be determined by the owner and recommends different frequencies for different structures. The applicant indicated to the inspectors that, if any degradation indications are found, the frequency will be increased to monitor these degradations more closely. The inspectors were satisfied with this approach.

The applicant also told the inspectors that, due to the complexity and accessibility of some structures, each walkdown will only be inspecting part of that structures and within a ten year period, all accessible portions of the structure will be inspected. The quarterly walkdowns will be performed by the system engineer for a very complex structure. The inspectors reviewed the last four quarterly inspection reports of the Auxiliary Building and the 1996 inspection report of the Intake Structure and found that the accessible portion of the Intake Structure was visually inspected in its entirety while only part of the Auxiliary Building was inspected each walkdown. The inspectors found this method acceptable.

The quarterly inspection reports for the Auxiliary Building did not have any unacceptable items listed. In Section 6 of the inspection report for the Intake Structure, it states that, for the service water pumps enclosure, there were corroded concrete anchors, severe degradation of the grout pads, missing or loose concrete anchors and/or nuts, etc. Condition report (CR) 96-01541 was issued on 6/27/96 to document and address the findings. Subsequently Work Request (WR) 96-AGCR1 was issued to correct the situation and the corrective action was completed in May, 1997. The inspectors walked down the service water pumps enclosure and was satisfied with the corrective action. This demonstrates that the SMP is an effective aging management program.

The inspectors inquired about any potential coating degradation on the containment internals and equipment inside the containment. Any degraded coating material could clog the containment sump screen to make the sump inoperable during a LOCA. The applicant indicated to the inspectors that during RO-19, a coating inspection of the containment interior was conducted by a contractor for RNP and the results were 0.15 cubic ft. of debris which is insignificant compared to the worst case of 1.83 cubic ft. as provided in Calculation RNP-M/MECH-1650, "ECCS Sump Zone of Influence for Coating Debris Transport," Revision 1, 10/19/99. The applicant also provided the inspectors a copy of Calculation RNP-C/CONT-1003, "RNP Containment Coating Exempt Log," Revision 2, 1/16/03. On Page 7 of this Calculation, it states that a 4000 sq. ft. area was assumed to be the zone of influence. The calculated net positive suction head (NPSH) lost, due to the worst case of 1.83 cubic ft. of debris, is 0.13 ft which is insignificant compare to the available NPSH of 15 ft. The inspectors found the calculation acceptable.

2. 10 CFR Part 50, Appendix J Program

Normally, the Appendix J Program does not manage any aging effect. It only detects containment leakages. In its IWE Program, the applicant requested reliefs from the NRC for exemptions from visual examinations on certain Examination Categories of the APP J Program. These Examination Categories are Category E-D, containment seals and gaskets and metallic shell and penetrations of Class CC components (relief request IWE/IWL-04) and Category E-G, pressure retaining bolting (relief request IWE/IWL-07). The NRC granted the relief requests on July 26, 1999 via a letter from Herbert Berkow to D.E. Young.

The applicant considers that their Appendix J Program is consistent with the GALL program XI.S4, 10 CFR 50, Appendix J. It utilizes the Integrated Leakage Rate Test (ILRT) and Local Leakage Rate Test (LLRT) of the containment to assure the adequacy of the selected pressure retaining components. Appendix I of Calculation RNP-L/LR-0615, "10 CFR 50, Appendix J Program," Revision 0, 1/24/02 lists the aging effects that are managed by this program.

The inspectors reviewed report GP-R-213850 of the most recent IRLT performed by General Physics Corporation on 4/10/1992. The report indicated that the test leakage rate was 0.0564% wt/day while the allowable leakage rate is 0.0750% wt/day. The result indicates that the pressure retaining components of the containment structure are functioning as designed.

3. ASME Section XI, Subsection IWE Program

Calculation RNP-L/LR-0616, "ASME Section XI, Subsection IWE," Revision 0, 1/24/02 provides the requirements of the inservice inspection of the containment liner and its attachments. This program is essentially the same as the GALL Program XI.S1. The Robinson IWE program utilizes many existing programs to complete its purpose. The program uses the Corrective Maintenance Procedure CM-764, "Inspection and Repair of CV Liner and Insulation," Revision 1, 4/4/01. CM-764 establishes the methodology, and documentation requirements for determining

the conditions of the containment liner and insulation. Section 7.2 provides the acceptance criteria for degraded areas of the CV liner including nominal thickness, elastic stability, and yield stress approach. The nominal thickness requirement, allows 10% degradation. But the yield stress engineering analysis approach, could allow as much as 40% thickness reduction to be found acceptable. However, Engineering Surveillance Test Procedure EST-150, "Containment Inspection (IWE/IWL)", Revision 4 specifies the acceptance criteria for the liner in Section 7.4.1. It states that, if the base metal degradation has reduced the thickness of the liner by greater than 10 percent of plate material thickness the condition will be subject to engineering evaluation or corrective action must be taken.

By letters of January 20 and June 25, 1999, the applicant submitted requests for relief from certain requirements of the ASME Section XI, Subsection IWE/IWL. Relief Request IWE/IWL-01 exempted the applicant from performing VT-3 examination on those portions of the insulated containment liner, which are considered inaccessible, except for areas that are exposed when a maintenance activity requires removal of the insulation. The insulation panels are approximately 3'-8" x 7'-8". To support the relief request, the applicant proposed to remove the lowest row of insulation panels to inspect the containment liner for potential corrosion and to repair any degraded coatings. 18 panels were removed during refueling outage (RO) RO-18 in 1998, 24 panels in RO-19 in 1999, and 16 panels in RO-20 in 2001. In addition to the lowest row of panels, additional panels at various locations and elevations were removed to accommodate maintenance during outages. This would bring the total number of panels removed during these three outages to approximately one hundred (100) which is about 5 percent of the total insulated panels of 2000. The NRC staff granted this relief request via letter on July 26, 1999. In the process of removing these 100 panels, the applicant discovered that approximately 6 panels are located either behind concrete block walls or in locations where very high radiation existed and were not examined. The liner in those areas was evaluated by Calculation RNP-C/STRU-1128, "Minimum Allowable Containment Liner Thickness," Revision 3, 5/7/01 as acceptable for continued service until 2005. The applicant told the inspectors that these 6 panels will be examined during RO-22 which is scheduled for later in 2003.

ESR 99-00005, "CV Liner Thickness Acceptance Criteria," Revision 3, 5/7/01, together with Calculation RNP-C/STRU-1128 evaluate the inspection results of the containment liner performed during the RO-19 and RO-20 and provides acceptance criteria for the corroded areas of the liner. Many locations of the examined liner have spots which exceeded the 10 percent maximum allowable thickness reduction and Calculation RNP-C/STRU-1128 provides engineering evaluations for these liner spots that are in degraded condition and qualified them as acceptable as is per the 90% yield stress or elastic stability approach. The inspectors consulted with NRR and agreed that, since the spots are not concentrated in a large area, this approach is acceptable.

4. ASME Section XI, Subsection IWL Program

The applicant considers its Calculation RNP-L/LR-0617, "Aging Management Program - ASME Section XI, Subsection IWL," Revision 1, 3/3/03 to be consistent with the GALL AMP XI.S2 and is credited for aging management of selected components in the Reactor Containment Building. Subsection IWL requires examination and testing of accessible components only, and the grouted post-tensioning system at RNP is not subject to ASME Section XI Rules. Since the tendons are encased in grout, sealed within sleeves, and embedded in structural concrete, they are considered permanently inaccessible.

As a program enhancement, examination of below-grade concrete, when excavated for any reason, will be included as part of the ASME Section XI, Subsection IWL Program. Procedure MMM-051, Plant Excavation and Backfill," Revision 1 will be revised to add as a requirement to notify Civil/Structural Design Engineering of the location and extent of any proposed excavation and before starting backfill against exposed concrete to determine if condition monitoring is required. The applicant also indicates on Page 24 of RNP-L/LR-0617 that a note will added to Section 8.5.3.1.2 of Technical Management Procedure TMM-124, "Inservice IWE/IWL Program," Revision 4 to examine representative samples of below-grade concrete when excavated for any reason. The inspectors concur with this approach.

The inspectors reviewed the last two IWL inspection reports during RO-19 (1999) and RO-20 (2001). No unacceptable findings were listed.

5. Dam Inspection Program

Calculation RNP-L/LR-0636, "Aging Management Program, Recommended Guidelines for Safety Inspections of Dams," Revision 2, 10/17/02 specifies that the Robinson Dam Inspection Program is consistent with the GALL XI.S7 Program which recommends the FERC/Corps of Engineers "Recommended Guidelines for Safety Inspections of Dams" to be the AMP for dams. Table 6.2-1 of RNP-L/LR-0636 provides the evaluation of each of the program elements delineated in the Gall Program and the conclusion is that the elements of the Robinson AMP are consistent with GALL, element by element.

The Robinson Dam is controlled by Unit 1 (Fossil Plant), however, the inspections performed are by independent consultants, qualified and experienced in the inspection of dams as stated in Element 5 of Table 6.2-1 of Calculation RNP-L/LR-0636. The applicant told the inspectors that the current frequency to inspect the dam every five years is consistent with the GALL recommendation and will be enhanced to add that, every ten years an underwater inspection shall be performed.

The inspector walked down the dam and spillway and found that the material condition was adequate and the ripraps are in good shape. Some recommendations from the last inspection, such as certain trees be cut down, have not been completed yet. The applicant indicates the recommended actions will be completed soon. The inspectors found the dam inspection program acceptable.

E. Inspection Items From NRR Staff Review

As a result of their technical review of the LRA, various members of the NRR staff requested that several items be verified during the AMP inspection. The following paragraphs document the inspection findings for the technical items requested by the NRR technical staff.

One item relates to the response to RAI 3.5.1-19 provided by the applicant. The NRC technical staff requested the inspectors to verify that the technical evaluation performed which concludes that potential degradation in the inaccessible areas of the containment liner, as indicated by the inspection in accessible areas, is acceptable until the scheduled one-time inspection in 2005. To verify this item the inspectors reviewed EGR-NGGC-0351, "Condition Monitoring of Structures", Rev. 11. This procedure refers to EGR-NGGC-0015 for containment structures. The inspectors also reviewed Technical Management Procedure, TMM-124, "Inservice IWE/IWL Program," Rev. 4. Section 8.5.2.7.1 of TMM-124 lists five inaccessible Class MC components subject to 10 CFR 50.55a requirements. The inspectors concluded that the applicant's procedure for concluding that potential degradation in the inaccessible areas, as indicated by the inspection in accessible areas, is acceptable until the scheduled one-time inspection in 2005. This issue is discussed further in section D.3 above.

The technical staff requested the confirmation of the reasonableness of the containment (liner and penetration) degradation accepted without repairs or corrective actions. The inspectors reviewed RNP-L/LR-0616 "Aging Management Program, ASME Section XI, Subsection IWE. Table 6.2-1 on page 20 of this document lists the acceptance criteria for the steel liner of the concrete containment. That acceptance criteria is consistent with that stated in the GALL IWE Program. The GALL text specifies acceptance standards that any material loss exceeding 10% of the nominal containment wall thickness is to be documented and resolved by engineering evaluation or corrective action taken. In conclusion, the applicant's acceptance criteria for degradation of the steel containment liner and penetration is consistent with GALL and the inspectors found this acceptable.

The technical staff requested the confirmation of the reasonableness of any observed containment concrete degradation being accepted without repairs or corrective actions. The applicant uses as a standard American Concrete Institute (ACI) 349.3R-96, "Evaluation of Existing Nuclear Safety Related Concrete Structures." This is consistent with the recommendations of the GALL program XI.S6. The applicant's acceptance criteria for concrete degradation based on the use of ACI 349.3R-96 is acceptable.

In LRA Table 3.2-1, Item 2 the applicant stated that "The RNP containment spray headers and valves are stainless steel". The technical staff requested the verification that indeed these component are made of stainless steel. The inspectors reviewed drawing no. 5379-1082LR, sheet 5 "Safety Injection System Flow Diagram." The drawing depicts the headers for containment spray pumps A and B. The piping codification is 6-SI-151R-41A which is a Class 151 piping. Class 151 piping is documented as stainless steel material as listed in CPL-HBR2-M-047 for H. B. Robinson - Unit 2, Revision 4, "Specification for Pipe and Piping Related Products Material Requirements." The inspectors concluded that the applicant's statement pertaining to the piping construction material was appropriate.

Another inspection item relates to LRA Table 3.2-1, Item 8 in which the applicant stated that "According to the GALL report, this group consists of heat exchangers cooled by an open cycle cooling water system. RNP does not have a heat exchanger that cools the containment spray to the containment." The technical staff requested a verification that the containment spray system does not have a heat exchanger that is serviced by an open cycle cooling water system. The inspectors reviewed CPL drawing no. 5379-1082LR, sheets 3 and 5, "Safety Injection System Flow Diagram." The drawing details the flow path through the containment spray pumps A & B. The water coming from the refueling water storage tank is pumped by containment spray pumps A and B. Visual inspection of both drawings shows no heat exchanger servicing the containment

spray water. The inspectors concluded that the applicant's statements pertaining to the containment spray not being cooled by open cycle cooling was appropriate.

In LRA Table 3.2-1, Item 12 the applicant stated that "There are no bolts with specified minimum yield strength > 150ksi in the ESF Systems, et.al." The technical staff requested the verification of this bolting material specification. The H.B. Robinson UFSAR, Revision 16, Section 6.1, "Engineering Safety Features," specifies that bolting material conformed with ASTM A-193. Part A, Table 2, of the referenced standard specifies the tensile requirements for this type of bolting. The minimum yield strength for all the grades listed in Table 2 are below 150ksi. The inspectors concluded that the applicant's statement pertaining to the minimum yield strength was appropriate.

Another item pertains to the verification of the inspection and replacement of fire hoses in accordance with NFPA guidance. The company conducts visual inspections and hydrostatic tests for fire hoses. The inspectors examined documents RNP "Plant Operating Manual," Vol. 3, Part 9, and OST #633 which discusses the procedures with regards to hydrostatic tests. Tests are conducted within a pressure range between 250 to 260 psig using a regulator valve set for 5 minutes. Another source of information examined was RNP Operating Manual," Vol. 3, Part 8, FP-013. Page 11 of this document describes the "Fire Protection Systems Surveillance Requirements" and states "hydrotests must be conducted every 3 years in accordance with NFPA 1962-1979". The conclusion is that the fire hose inspection and replacement program at RNP appears to be appropriate in accordance with NFPA guidance.

This item pertains to the verification of the replacement of "fire pump casings" based on a statement in Table 3.3-2, Item 30 of the LRA. To verify the described procedure several documents were examined. First the applicant provided written evidence that presents the last overhaul cycles for two different fire pumps. The inspectors reviewed supporting work orders, purchase orders, and repair reports for both overhauls of the fire pumps. During a conference call held between the NRC technical staff and the applicant, it was determined that fire pump casings are actually replaced on the discretion of the pump manufacturing company and not based on a RNP preventive maintenance procedure. Therefore, the NRC staff requested the applicant to modify the statement in Table 3.3-2, Item 30 of the LRA to state, "fire pump overhaul." The NRC technical staff will include such a statement in the SER write-up as a confirmatory item.

F. Followup of Previously Identified Problems

During the first LR inspection documented in NRC Report Number 50-261/2003-008, the inspectors identified several problems. These included: several inconsistencies between the applications, boundary drawings and calculation references [documented in Action Request (AR) 89349]; the failure to include Unit 1 to Unit 2 fuel oil transfer piping in scope; a confusing calculation (RNP-L/LR-0396) describing the applicants review of the effects of non-safety-related piping on safety-related piping which also had some errors. The applicant corrected the inconsistencies and several additional errors identified during the extent of condition review for AR 89349. The applicant also added the fuel oil piping in scope. In addition, the applicant revised the confusing calculation to clarify the applicant's process and corrected the errors. The inspectors reviewed the AR 89349 and all of the corrected documents and concluded that the applicant had implemented appropriate corrective actions for the previously identified problems.

Exit Meeting Summary

The results of this inspection were discussed on June 27, 2003, with members of the CPL staff in an exit meeting open for public observation at the Hartsville Memorial Library. The applicant acknowledged the findings presented and presented no dissenting comments. The applicant was asked if any of the documents reviewed during this inspection were proprietary and the reply was that none were.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Applicant

C. Baucom, Supervisor Licensing
C. Burton, Director Site Operations
T. Cleary, Plant General Manager
T. Clements, Manager License Renewal
D. McNeill, Supervisor Communications
J. Moyer, Robinson Site Vice President
R. Stewart, Supervisor License Renewal

NRC

M. Cora, Project Manager
B. Desai, Senior Resident Inspector
D. Jones, Resident Inspector
S. Mitra, Senior Project Manager
L. Reyes, Regional Administrator

Public

J. Kirven, Local Resident
J. Faile, The Messenger

LIST OF DOCUMENTS REVIEWED

Licensing Documents

Robinson Nuclear Plant License Renewal Application, 06/17/2002
H. B. Robinson Updated Final Safety Analysis Report

License Renewal Procedures

ENG-NGGC-0501, Nuclear Plant License Renewal Program, Rev. 5
RNP-L/LR-0300, Material/Environment Aging Effects Tools for License Renewal, Rev. 5

Aging Management Programs

RNP-L/LR-0605, Metal Fatigue of Reactor Coolant Pressure Boundary (Fatigue Monitoring Program), Rev. 0
RNP-L/LR-0620, Nickel-Alloy Nozzles and Penetrations Program, Rev. 0
RNP-L/LR-0501, Neutron Embrittlement TLAA Review for the RNP Reactor Vessel, Rev. 1
RNP-L/LR-0613, Reactor Vessel Surveillance Program, Rev. 0
RNP-L/LR-0614, PWR Vessel Internals Program, Rev. 1
RNP-L/LR-0604, Steam Generator Tube Integrity Program, Rev. 0
RNP-L/LR-0606, ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program, Rev. 2

RNP-L/LR-0621, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel Program, Rev. 0
 RNP-L/LR-0609, Flux Thimble Eddy Current Inspection Program, Rev. 0
 RNP-L/LR-0602, Open cycle Cooling Water System Program, Rev. 5
 RNP-L/LR-0619, Reactor Head Stud Closure Program, Rev. 1
 RNP-L/LR-0606, ASME Section XI, SubSections IWB, IWC, and IWD Inservice Inspection Program, Rev. 2 [Vessel Head Bolts]
 RNP-L/LR-0632, One- Time Inspection Program, Rev. 3
 RNP-L/LR-0618, ASME Section XI, Subsection IWF Program, Rev. 2
 RNP-L/LR-0625, Bolting Integrity Program, Rev. 0
 RNP-L/LR-0640, Systems Monitoring Program, Rev. 2
 RNP-L/LR-0627, Closed Cycle Cooling Water System, Rev. 1
 RNP-L/LR-0629, Buried Piping and Tanks Surveillance Program, Rev. 0
 RNP-L/LR-0634, Buried Piping and Tanks Inspection Program, Rev. 1
 RNP-L/LR-0631, Fuel Oil Chemistry Program, Rev. 2
 RNP-L/LR-0600, Water Chemistry Program, Rev. 2
 RNP-L/LR-0630, Above Ground Carbon Steel Tanks Program, Rev. 1
 RNP-L/LR-0633, Selective Leaching of Materials Program, Rev. 1
 RNP-L/LR-0601, Boric Acid Corrosion Program, Rev. 1
 RNP-L/LR-0615, 10 CFR 50 Appendix J Program, Rev. 0.
 RNP-L/LR-0608, Structures Monitoring Program, Rev. 1
 RNP-L/LR-0616, ASME Section XI, Subsection IWE, Rev. 0
 RNP-L/LR-0636, Recommended Guidelines for Safety Inspections of Dams, Rev. 2
 RNP-L/LR-0617, ASME Section XI, Subsection IWL, Rev. 1
 RNP-L/LR-0612, Fire Protection Program, Rev. 4
 RNP-L/LR-0611, Fire Water System Program, Rev. 4

Aging Management Reviews

RNP-L/LR-0373, Reactor Coolant System Supports, Rev. 3
 RNP-L/LR-0396, Screening and Aging Management Review Criterion 2 Piping, Rev. 3
 RNP-L/LR-0390, Aging Management Review of Electrical Commodities for License Renewal, Rev. 0

Existing Plant Procedures and Programs

PLP-109, Cycle and Transient Monitoring, Rev. 4
 EST-151, Reactor Vessel Surveillance Capsule Testing, Rev. 5
 TMM-112, Steam Generator Inspection (Refueling Outage), Rev. 13
 PLP-025, Inservice Inspection Programs, Rev. 17
 TMM-038, Inservice Examination Program, Rev. 7
 OST-201-1, MDAFW System Component Test - Train A, Rev. 20 [SW flow to the pump bearings]
 CP-001, Chemistry Monitoring Program, Rev. 66
 CP-009, Chlorination, Rev. 23
 TMM-38, Inservice Examination Program, Rev. 7
 CM-201, Safety and Non-Safety Related Heat Exchanger Maintenance, Rev. 33
 EST-116, Service Water Piping Inspection, Rev. 3
 MRP-003, Reactor Vessel Stud Removal and Installation, Rev. 31
 HBR-MT-86-1, Magnetic Particle Examination of Welds and Bolting, Rev. 1
 OST-151-1, Safety Injection system Components Test - Pump "A", Rev. 18
 PM-403, Cathodic Protection System Rectifier Inspection and Cleaning, Rev. 7
 PM-417, Cathodic Protection System Soil to Structure Potential Measurement, Rev. 7

PM-467, Fuel Oil Transfer Pressure Test, Rev. 3
 TMM-104, System Walkdown Procedure, Rev. 12
 OST-408, Diesel Fuel Oil Storage Tank Drain and Refill, Rev. 10
 CP-003, Systems Sampling Procedure, Rev. 50
 CHE-NGGC-0023, Suspended Particulate Matter in Fuels, Rev. 2
 CP-005, Secondary Chemistry Corrective Action Program, Rev. 21
 CP-200, Chemistry Program Implementation, Rev. 4
 CP-001, Chemistry Monitoring Program, Rev. 66
 PLP-40, Program for Prevention of Boric Acid Corrosion, Rev. 10
 TMM-015, Inservice Repair and Replacement Program, Rev. 31
 TMM-020, Inservice Pressure Testing Program, Rev. 13
 EST-108, Flux Thimble Eddy Current Inspection (Specified Refueling Outages), Rev. 6
 ESR-00005, CV Liner Thickness Acceptance Criteria, Rev. 3
 TMM-124, Inservice IWE/IWL Program, Rev. 4
 EST-150, Containment Inspection (IWE/IWL), Rev. 4
 TMM-005, "10 CFR 50, Appendix J Testing Program, Rev. 20

Plant Data/Results

Transient Accounting Summary for PLP-109, dated 03/05/2002
 EST-083, Inservice Inspection Pressure Testing of Reactor Coolant System (Refueling Shutdown Interval), Rev. 20
 EST-108, Flux Thimble Eddy Current Inspection, dated 04/16/2001
 Work Order 00282358 (TYPICAL) Inspect EDG exhaust silencer.
 Work Order 00234933 (TYPICAL) System 2080 Support ID 233/A

Other Documents

Responses and supplemental information for NRC Bulletin 2001-01, Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles; dated 09/04/2001, 10/02/2001, 10/19/2001, 10/24/2001, 11/02/2001, 11/12/2001, 08/12/2002, and 12/13/2002
 Responses and supplemental information for NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity; dated 04/01/2002, 05/17/2002, and 01/31/2003
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 Technical Memorandum Number TM-R-1005-001, Evaluation of Robinson Nuclear Plant Reactor Vessel Radiation Surveillance Program, dated 06/17/1992
 WCAP-15363, A Demonstration of Applicability of ASME Code Case N-481 to the Primary Loop Pump Casings of H. B. Robinson Unit 2 for the License Renewal Program, Rev. 1
 WCAP-15628, Technical Justification for Eliminating Large Primary Loop Pipe Rupture as the Structural Design Basis for the H. B. Robinson Unit 2 Nuclear Power Plant for the License Renewal Program, Rev. 0
 R-ERC-02-01, Environmental & Chemistry and Radiation Control Assessment, dated 4/11/02
 R-ERC-01-01, Environmental & Chemistry and Radiation Control Assessment, dated 4/6/01
 Condition Report (CR) 96-02807, Secondary Chemical Action Level 1, Chloride and Sulfate Concentrations Exceed Action Level
 CR 94-00357, Increasing Sulfate Values
 CR-98-00961, Increase in Steam Generator Sodium When Condensate Polisher Placed in Service.
 Assessment AR-68113, Boric Acid Corrosion Control Programs, dated 8-14, 2002

Work Order-00053199-01, 4/7/01, Removing the liner insulation, inspection of coating, inspection of liner, inspection of moisture barriers, evaluation and repair of liner, and restoration of insulation.

RNP-C/CONT-1003, RNP Containment Coating Exempt Log, Rev. 2

RNP-M/MECH-1650, ECCS Sump Zone of Influence for Coating Debris Transport, Rev. 1

RNP-L/LR-0392, Scoping of PVC Insulated Cables for License Renewal, Rev. 0.

EGR-NGGC-0507, Cable Aging Management Program, Rev. 0

ATTACHMENT 2

Robinson Nuclear Plant
Aging Management Programs Selected For Inspection

Water Chemistry Program
Boric Acid Corrosion Program
Buried Piping And Tanks Surveillance Program
Buried Piping And Tanks Inspection Program
Above Ground Carbon Steel Tanks Program
Fuel Oil Chemistry Program
Preventive Maintenance Program
Selective Leaching of Materials Program
Asme Section Xi, Subsection Iwb, Iwc And Iwd Program
Steam Generator Tube Integrity Program
Flux Thimble Eddy Current Inspection Program
Reactor Vessel Surveillance Program
Metal Fatigue of Reactor Coolant Pressure Boundary
(Fatigue Monitoring Program)
Nickel-alloy Nozzles And Penetrations Program
Thermal Aging Embrittlement of Cast Austenitic Stainless
Steel (Cass) Program
Pwr Vessel Internals Program
Reactor Head Closure Studs Program
Asme Section Xi, Subsection Iwf Program
Closed-cycle Cooling Water System Program
Flow-accelerated Corrosion Program
Bolting Integrity Program
Open Cycle Cooling Water System Program
Inspection of Overhead Heavy Load And Light Load Handling
Systems Program
Systems Monitoring Program
One-time Inspection Program
10 Cfr Part 50, Appendix J Program
Asme Section Xi, Subsection Iwe Program
Asme Section Xi, Subsection Iwl Program
Structures Monitoring Program
Dam Inspection Program
Fire Protection Program
Fire Water System Program
Non-eq Insulated Cables And Connections Program

ATTACHMENT 3
LIST OF ACRONYMS USED

ACI	American Concrete Institute
AMP	Aging Management Program
AMR	Aging Management Review
AR	Action Request
CASS	Cast Austenitic Stainless Steel
CCW	Component Cooling Water System
CPL	Carolina Power and Light Company
CR	Condition Report
ECCS	Emergency Core Cooling Systems
EDG	Emergency Diesel Generator
EQ	Environmental Qualification Program
FAC	Flow Assisted Corrosion
GALL	Generic Aging Lessons Learned Report
HVAC	Heating Ventilation and Air Conditioning
ILRT	Integrated Leak Rate Test
ISI	Inservice Inspection Program
LLRT	Local Leak Rate Test
LOCA	Loss Of Coolant Accident
LR	License Renewal
LRA	License Renewal Application
MIC	Microbiologically Induced Corrosion
MR	Maintenance Rule
NSR	Non Safety Related
NRR	NRC Office of Nuclear Reactor Regulation
PM	Preventive Maintenance
RAB	Reactor Auxiliary Building
RAI	Request for Additional Information
RCS	Reactor Coolant System
RO	Refueling Outage
RV	Reactor Vessel
RVH	Reactor Vessel Head
RVI	Reactor Vessel Internals Program
RWST	Refueling Water Storage Tank
SBO	Station Blackout Event
SG	Steam Generator
SI	Safety Injection
SMP	Structures Monitoring Program
SR	Safety Related
SSC	Systems, Structures, and Components
SW	Service Water System
UFSAR	Updated Final Safety Analysis Report