UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

November 29, 2005

MEMORANDUM TO: ACRS Members

FROM: Cayetano Santos Jr., Senior Staff Engineer
Technical Support Staff
ACRS/ACNW

SUBJECT: CERTIFICATION OF THE MINUTES OF THE PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING ON THE BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3 LICENSE RENEWAL APPLICATION, OCTOBER 5, 2005 - ROCKVILLE, MARYLAND

The minutes of the subject meeting were certified on November 28, 2005, as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc w/o Attachment:
J. Larkins
A. Thadani
M. Scott
M. Snodderly
S. Duraiswamy

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

MEMORANDUM TO: Cayetano Santos Jr., Senior Staff Engineer
Technical Support Staff, ACRS

FROM: Mario Bonaca, Chairman
ACRS Plant License Renewal Subcommittee

SUBJECT: CERTIFICATION OF THE MINUTES OF THE ACRS SUBCOMMITTEE MEETING ON THE BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3 LICENSE RENEWAL APPLICATION, OCTOBER 5, 2005 - ROCKVILLE, MARYLAND

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting on October 5, 2005, are an accurate record of the proceedings for that meeting.

Mario J. Bonaca 11/28/05

Mario Bonaca, Date
Plant License Renewal Subcommittee Chairman

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

October 24, 2005

MEMORANDUM TO: Mario Bonaca, Chairman
ACRS Plant License Renewal Subcommittee

FROM: Cayetano Santos Jr., Senior Staff Engineer,
Technical Support Staff
ACRS/ACNW

SUBJECT: WORKING COPY OF THE MINUTES OF THE ACRS SUBCOMMITTEE MEETING ON THE BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3 LICENSE RENEWAL APPLICATION, OCTOBER 5, 2005 - ROCKVILLE, MARYLAND

A working copy of the minutes for the subject meeting is attached for your review. Please review and comment on them at your earliest convenience. If you are satisfied with these minutes please sign, date, and return the attached certification letter.

Attachments: Certification Letter
Minutes (DRAFT)

cc w/o Attachment:
J. Larkins
A. Thadani
M. Scott
M. Snodderly
S. Duraiswamy

CERTIFIED on 11/28/05 by Mario Bonaca
Issued 10/24/05

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MINUTES OF THE ACRS PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING
ON THE BROWNS FERRY NUCLEAR PLANT UNITS 1, 2, AND 3
OCTOBER 5, 2005
ROCKVILLE, MARYLAND

On October 5, 2005, the Plant License Renewal Subcommittee held a meeting in Room T2B3, 11545 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to review and discuss the license renewal application (LRA) for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3 and the associated Safety Evaluation Report (SER) with open items.

The meeting was open to the public. No written comments or requests to make oral statements were received from members of the public related to this meeting. Mr. Santos was the Designated Federal Official for this meeting. The meeting convened at 12:30 p.m. and adjourned at 4:20 p.m. on October 5, 2005.

ATTENDEES:

ACRS MEMBERS/STAFF

Mario Bonaca, Chairman
William Shack, Member
Graham Leitch, Consultant
Cayetano Santos Jr., ACRS Staff
Thomas Kress, Member
John Sieber, Member
John Barton, Consultant
John Lamb, ACRS Staff

NRC STAFF/PRESENTERS

Y. Sanabria, NRR
Y. Li, NRR
R. Auluck, NRR
M. Chernoff, NRR
D. Merzke, NRR
E. Brown, NRR
K. Tanabe, NRR
G. Cranston, NRR
C. Li, NRR
S. Hoffman, NRR
B. Rogers, NRR
K. Cozens, NRR
G. Cheruvenki, NRR
A. Lee, NRR
K. Chang, NRR
R. Pettis, NRR
J. Rowley, NRR
J. Raval, NRR
J. Tapp, NRR
M. Mitchell, NRR
P. Kuo, NRR
R. Subbaratnam, NRR
K. Parczewski, NRR
R. McNally, NRR
A. Hodgdon, OGC
S. Cahill, Region II
C. Julian, Region II
J. Zimmerman, NRR
M. Marshall, NRR
S. Mitra, NRR
A. Pal, NRR
H. Ashar, NRR
D. Jeng, NRR
L. Lois, NRR
J. Eads, NRR
J. Guo, NRR
N. Iqbal, NRR
M. Hartzman, NRR
H. Walker, NRR
B. Elliot, NRR
J. Yerokun, RES
T. Le, NRR

OTHER ATTENDEES

K. Groom, TVA
P. Crowley, Arizona Public Service
D. Burrell, TVA
K. Sutton, Morgan Lewis
B. Crouch, TVA
J. Valente, TVA

R. DeLong, TVA
H. Jones, TVA
R. Rucker, First Energy
K. Brune, TVA
M. Hamby, TVA
E. Blocher, Parsons
M. Heath, PGN
L. Beller, Progress Energy
R. Moll, TVA
J. McCarthy, TVA
S. Dort, First Energy
R. Jennings, TVA
D. Arp, TVA
R. Jansen, TVA
K. Green, ISL
M. Granthan, Progress Energy

The presentation slides, handouts used during the meeting, and a complete list of attendees are attached to the office copy of the meeting minutes.

Opening Remarks

Mario Bonaca, Chairman of the Subcommittee on Plant License Renewal, convened the meeting and made a few introductory remarks. The purpose of this meeting is to review the Tennessee Valley Authority (TVA) LRA for BFN, Units 1, 2, and 3 and the associated SER with open items. Chairman Bonaca summarized the major issues identified at the joint meeting of the Plant License Renewal and Plant Operations subcommittees on September 21, 2005.

Since BFN Unit 1 lacks the significant operating experience intended by the license renewal rule, compensatory actions have been implemented. These include applying operating experience from Units 2 and 3 and performing periodic inspections of Unit 1 components that that were not replaced prior to restart. The Unit 1 Periodic Inspection Program is appropriate but more information is needed in order to determine its adequacy. The final SER should be revised to (1) discuss BFN Unit 1 operating experience, (2) describe the Unit 1 Periodic Inspection Program, and (3) clearly distinguish one-time inspections for license renewal from other inspections.

Staff Introduction

Mr. Kuo, NRR, introduced several members of the NRC staff including Mr. Subbaratnam (Project Manager), Ms. Diaz (Project Manager), Mr. Julian (Regional Inspector), and Mr. Cahill (Regional Inspector). The staff's review of this LRA is complicated by the concurrent licensing actions for extended power uprate (EPU), restart, and license renewal. Mr. Kuo emphasized that the staff's review of this LRA is based on the currently licensed power levels for each unit.

The staff will revise the SER to address the Unit 1 Periodic Inspection Program, the Unit 1 operating experience, and the terminology for one-time inspections.

Browns Ferry License Renewal Application

The presentation by Mr. Crouch, TVA, and Mr. DeLong, TVA, described the Browns Ferry plant, the Unit 1 Layup Program, Unit 1 operating experience, commitments for license renewal, and the open items.

All three BFN units are General Electric BWR4 reactors with Mark I containments. Units 2 and 3 were restarted in 1991 and 1995, respectively. Unit 1 is currently being recovered with restart planned for May 2007. The approximate durations of power operation are 10 years for Unit 1, 23 years for Unit 2, and 18 years for Unit 3. Mr. Crouch noted that all performance indicators for these units are green.

In a letter dated December 31, 2003, TVA submitted a single LRA for BFN Units, 1, 2, and 3. This LRA is based on the currently licensed thermal power levels for each unit (3298 MWt for Unit 1 and 3458 MWt for Units 2 and 3). Appendix F of the LRA describes the differences in the current licensing basis (CLB) between Unit 1 and Units 2 and 3. These differences will be eliminated prior to restart of Unit 1. The current licenses expire on December 20, 2013, for Unit

1, June 28, 2014, for Unit 2, and July 2, 2016, for Unit 3.

Mr. DeLong, TVA, stated that 77 mechanical and electrical systems were included in the scope of license renewal. Scoping was based on reviews of the Updated Final Safety Analysis Report, safe shutdown analyses, licensing basis documents, maintenance rule documents, and the plant component database. The scoping methodology also considered events such as environmental qualification, fire protection, anticipated transients without scram, and station blackout.

The Time-Limited Aging Analyses (TLAAs) identified in the LRA include neutron embrittlement of the reactor vessel and internals, metal fatigue, environmental qualification of electrical equipment, primary containment fatigue, and other plant-specific analyses. The TLAAs associated with neutron embrittlement were based on 54 Effective Full Power Years (EFPY) for Unit 1 and 52 EFPY for Units 2 and 3. This resulted in peak reactor vessel fluences of 1.95 x 10^{18} n/cm^2 for Unit 1 and 2.3 x 10^{18} n/cm^2 for Units 2 and 3. These fluences also assumed EPU conditions.

Mr. DeLong listed the 39 aging management programs (AMPs) credited for license renewal at BFN. Eleven of these AMPs are existing programs that require no enhancement and 11 are existing programs whose only revision is to include Unit 1. Six of these AMPs are new programs. The One-Time Inspection Program is one of the new AMPs. This program confirms that aging effects are not occurring or that aging effects are occurring at a rate that does not affect the intended function of the component. These inspections will be completed prior to entering the period of extended operation. Some of the components that will be inspected under this program include the reactor coolant pressure boundary, the bottoms of above ground tanks, submerged concrete and component supports, and ventilation ducts.

Thirty-eight of the 39 AMPs are common to all three units. The Unit 1 Periodic Inspection Program applies only to Unit 1. Mr. Crouch stated that this program will inspect a subset of nonreplaced piping locations in Unit 1 to verify that no additional aging effects are occurring. Credit will be taken for restart inspections of these components. The first round of inspections will be completed after several years of Unit 1 operation but prior to entering the period of extended operation. Additional inspections will be performed during the period of extended operation. The frequency of subsequent inspections will be determined based on inspection results.

Unit 1 Layup

Mr. Crouch stated that the Unit 1 Layup Program is consistent with the criteria in EPRI NP-5106, "Sourcebook for Plant Layup and Equipment Preservation," Revisions 0 and 1. In addition, lessons learned from the layup and restart of Unit 3 are being applied to Unit 1. Both wet and dry layup conditions are used in Unit 1 systems. Visual, surface, ultrasonic, and remote inspections were performed to assess the condition of Unit 1 components and results have met or exceeded the EPRI guidelines. Mr. Crouch emphasized that TVA has not taken credit for this layup program **as the sole basis** for determining the acceptability of components for restart.

Chairman Bonaca noted that the SER documents several problems with the Unit 1 Layup Program. Mr. Crouch responded that these problems occurred during the initial implementation of the layup program and have been corrected.

Unit 1 Operating Experience

BFN Unit 1 meets the requirement of 10 CFR 54.17(c) that "an application for a renewed license may not be submitted to the Commission earlier than 20 years before the expiration of the operating license currently in effect." The operating experience from BFN Units 2 and 3 are applicable to Unit 1. Both internal and external plant operating experience has been

incorporated into the BFN Corrective Action Program.

BFN Unit 3 was shut down for ten years before it was restarted in 1995. During the last ten years of operation, no layup-induced aging effects have been observed. Experience with the layup of Unit 3 has been incorporated into the recovery of Unit 1. The licensing basis, design, configuration, operating procedures, technical specifications, and updated Final Safety Analysis Report for all three units will be identical when Unit 1 restarts.

License Renewal Commitments

To date TVA has made approximately 114 license renewal commitments through the LRA and responses to requests for additional information. These commitments are tracked using two separate systems: the onsite computerized commitment tracking system (TROI) and the Corrective Action Program.

Open Items

Mr. Crouch concluded his presentation by listing three of the license renewal open items. The staff noted that there are now four open items because the issue of the Unit 1 Periodic Inspection Program was elevated from a confirmatory item to an open item.

Safety Evaluation Report Overview

The presentation by Mr. Subbaratnam, NRR, and Ms. Diaz, NRR, described the staff's evaluation of scoping and screening activities, aging management activities, and TLAAs.

The SER with open items related to BFN Units 1, 2, and 3 was issued on August 9, 2005. It contained two open items, three confirmatory items, and four proposed license conditions. Since the SER was issued one additional open item was added and one of the confirmatory items was elevated to an open item.

Scoping and Screening Results

TVA revised its methodology for scoping of supports and equivalent anchors for cases in which nonsafety-related components are directly connected to safety-related components. As a result, new portions of piping components and two additional structures were brought into the scope of license renewal.

Based on the staff's review of the containment penetration seals and the associated piping and supports outside of the secondary containment, TVA made changes to the mechanical system boundary drawings.

One of the open items deals with scoping of the refueling cavity seal. Leakage from this seal could lead to corrosion of the inaccessible portion of the drywell shell. The staff proposed that TVA either bring the refueling cavity seal into the scope of license renewal or periodically monitor the inaccessible portion of the drywell shell for degradation.

Scoping and screening of electrical and I&C systems were performed using the spaces approach. The staff questioned the exclusion of the source range monitor and intermedaite range monitor circuit cables from the scope of license. TVA agreed to bring the intermediate range montior circuits into scope and manage them with a suitable AMP.

Section 2.6 of the SER describes the integration of the restart and license renewal activities for BFN Unit 1. Appendix F of the LRA describes 13 differences in the CLB of Unit 1 and Units 2 and 3. One of the proposed license condition is that these differences be eliminated.

The staff concluded that pending the satisfactory resolution of open items, the applicant has

adequately identified those systems and components within the scope of license renewal and subject to an aging management review.

Aging Management Program Review and Audits

Mr. Subbaratnam described the staff's evaluation of some of the AMPs and aging management reviews for BFN.

The Overhead Heavy Load and Light Load Handling Systems Program takes exception to a recommendation in the Generic Aging Lessons Learned (GALL) Report that crane fatigue be monitored. TVA evaluated fatigue of the reactor building crane as a TLAA so fatigue monitoring was not required. The staff found this acceptable.

The Buried Piping and Tanks Inspection Program relies solely on opportunistic inspections. TVA has committed to inspect buried piping within ten years of entering the period of extended operation unless an opportunistic inspection has occurred. If a conclusive opportunistic inspection has not occurred within this ten-year period, TVA will perform a focused inspection of buried piping.

During the review of the Aboveground Carbon Steel Tanks Program, the staff noted that this AMP does not measure the bottom thicknesses of fuel oil tanks. TVA revised the One-Time Inspection Program to require ultrasonic thickness measurements of these components.

One of the confirmatory items deals with loss of preload and cracking of bolting. The staff requested the results of any self assessments, inspections, and maintenance activities on auxiliary system bolting. Region II will document their review of this information in an inspection report to be issued in November 2005.

The aging management review of inaccessible areas of civil structures and components examined test samples taken from groundwater and the Wheeler Reservoir. Based on the pH, chloride level, and sulfate level, the environment is non-aggressive.

Section 3.7 of the SER describes the aging management review of Unit 1 systems in layup. In order to address the staff's concern about new degradation mechanisms from the extended outage, TVA committed to perform periodic inspections of Unit 1 components through the period of extended operation. The staff is currently reviewing the elements of the Unit 1 Periodic Inspection Program submitted by TVA. The final SER will document the staff's review of this program. The staff has elevated this issue from a confirmatory item to an open item.

The staff concluded that pending satisfactory resolution of open items, the applicant has demonstrated that aging effects will be adequately managed so that the intended functions of systems and components will be maintained consistent with the CLB for the period of extended operation.

Time-Limited Aging Analyses

Ms. Diaz, NRR, described the staff's evaluation of TLAAs associated with neutron embrittlement, metal fatigue, and stress relaxation of core plate hold-down bolts.

Neutron embrittlement effects the reactor vessel and internals. The minimum upper shelf (USE) energy requirements for vessel materials are described in 10 CFR 50 Appendix G. TVA assumed that USE values did not meet these requirements so they performed a generic analysis that demonstrates margins equivalent to those in 10 CFR 50 Appendix G through the end of the period of extended operation. In an independent analysis, the staff confirmed this conclusion. Ms. Diaz also provided a table of the adjusted reference temperatures for the limiting beltline materials in each unit.

The Fatigue Monitoring Program will manage the effects of aging on components with cumulative usage factors that are projected to exceed the ASME Section III Class 1 limit before the end of the period of extended operation.

One of the open items deals with stress relaxation of core plate hold-down bolts. A TLAA was performed assuming a 20% loss of preload. TVA's plant-specific analysis stated that these bolts will maintain sufficient preload to prevent sliding of the core plate and meet ASME Section III Class 1 Level D service limits at the end of the period of extended operation. The staff reviewed the generic stress relaxation analysis and requested additional information regarding horizontal and vertical loads for all operating conditions, sliding of the core plate, and bolt stresses.

In section 4.8 of the SER, the staff concluded that pending satisfactory resolution of open items, the applicant has provided adequate analyses of TLAAs.

Onsite Inspection Results

License Renewal

Mr. Julian, Region II, described the inspections performed by the Region to support the NRR's review of the LRA. A site-specific inspection plan is developed for each applicant, but the same team of inspectors are used for consistency. These inspections were performed according to Manual Chapter (MC) 2516 and Inspection Procedure (IP) 71002. MC 2516 and IP 71002 have been revised to reduce the scope of the scoping and screening inspections and combine them with the AMP inspections. The objective of the scoping and screening inspection is to confirm that the applicant has included all appropriate structures, systems, and components in the scope of license renewal. The focus of this inspection is on scoping of nonsafety-related equipment that could impact safety-related equipment.

The objective of the AMP inspection is to confirm that existing AMPs are working well and to examine the applicant's plans for establishing and enhancing other AMPs. During this inspection, inspectors examine records of past tests and surveillances, verify the inclusion of future tasks into established tracking systems, and verify that the material condition of the plant is being adequately maintained.

An additional (optional) inspection can be performed to close out open items from previous inspections or issues requested by NRR. This inspection also verifies that a transition plan for the completion of the license renewal project has been established.

The AMP inspection for BFN was conducted from November 29, to December 17, 2004. Inspectors found that existing programs are generally functioning well, but the applicant had not begun the implementation process for new and enhanced AMPs. In walkdowns of plant systems, inspectors examined plant equipment and found no significant adverse conditions. It appeared that plant equipment was being adequately maintained.

A second AMP inspection was conducted from September 19 to 23, 2005 to review a sample of AMP implementation packages. Inspectors found that the packages contained some errors and were not meticulously reviewed. In response to these findings, TVA initiated a Problem Evaluation Report (PER) for corrective action. Inspectors also reviewed TVA's plans for tracking future actions and found that the implementation packages were not linked to the computerized commitment tracking system. The commitments were in the tracking system but they were difficult to find. TVA committed to track future actions using their PER process. Region II plans to conduct a future inspection to followup on these issues.

Mr. Julian concluded his presentation by stating that all of the performance indicators for BFN Units 2 and 3 are green.

Unit 1 Inspections

Mr. Cahill, Region II, described the Regions oversight activities regarding the restart of Unit 1. In August 2003 the NRC established MC 2509 specifically for the oversight of BFN Unit 1. A unique NRC manual chapter was needed because (1) the Reactor Oversight Process (ROP) was implemented after the recoveries of Units 2 and 3, (2) TVA was using their normal design change process for the recovery, and (3) the focus of inspections should be on program implementation and not on program adequacy. In developing MC 2509 a conscious decision was made not to test new construction approaches.

The regulatory framework for the restart of Unit 1 was issued by the NRC on August 14, 2003. The Unit 1 inspection plan is unlike that used for new construction in that it is based on the regulatory framework document and the Recovery Issues List. This list was first issued publicly in July 2005 and is updated quarterly by TVA. Inspections are performed when programs are completed and substantial physical work has been done. The focus of inspections are to review applicable inspection procedures for reference, review issue background and references, identify any differences from the resolution of Units 2 and 3, and sample TVA's implementation.

The NRC has also established a matrix to transition Unit 1 into the ROP. As of January 1, 2005, four of the ROP cornerstones are being used for Unit 1.

In the final phases of recovery, the focus of inspections will be on system adequacy testing. This will be done by a risk-informed sampling to ensure systems can perform their intended safety function.

Mr. Cahill concluded his presentation by describing the staff's current inspection plans for BFN Unit 1. The charter of the Restart Oversight Panel has been prepared and is ready for signature. The staff is planning for inspections of system recoveries and reviewing the restart test program. Finally, license renewal and EPU open items will be incorporated into the Region's inspections as appropriate.

Subcommittee Discussion

Several Members commented that the final SER should discuss the operating experience issue for Unit 1. This should include a better justification of the applicability of operating experience from Units 2 and 3 to Unit 1.

Consultant Leitch stated that the configuration of Unit 1 being approved for license renewal should be clarified because the unit has undergone many changes since the LRA was originally submitted. Consultant Leitch also noted that the issue of AMP ownership is important and the staff should review TVA's plan for transferring these license renewal programs to the permanent plant staff.

Member Kress commented that TVA has identified the correct AMPs and followed the guidance in the GALL Report. Member Kress added that the Region's presentations were useful.

Member Sieber stated that the Region's restart inspections are appropriate.

Member Shack stated that TVA has restart experience from Unit 3 and has a good case for the applicability of operating experience from Units 2 and 3 to Unit 1. Member Shack expressed concern about the slow development of the procedures for the AMPs.

Consultant Barton stated that transient testing is important in order to verify that all of the new equipment will behave as expected.

Chairman Bonaca stated that if the Unit 1 Periodic Inspection Program is appropriate, there

does not appear to be anything that would preclude the issuance of a renewed license.

The Members also provided guidance to TVA and the staff regarding their presentations to the Full Committee on October 6, 2005.

Member Comments and Questions

General

Since the configuration of BFN Unit 1 has changed since the LRA was submitted in 2003, Consultant Leitch asked what configuration is the basis of the staff's review. The staff responded that their review is based on the configuration of Unit 1 at restart. TVA added that as part of the Unit 1 recovery effort, no new materials have been introduced that were not already in use at Units 2 and 3.

In response to a question from Member Shack the staff stated that Appendix F of the LRA lists the necessary **and sufficient** changes that need to be made in order to make the CLB of Unit 1 identical to that of Units 2 and 3. Consultant Leitch requested that the licensing basis updates be provided to the Committee.

In response to a question from Consultant Leitch, TVA stated that Unit 1 is partially under the ROP process and partially under traditional enforcement. There are no inspection findings greater than green for BFN.

TVA states that Unit 1 will be restarted at the uprated power level and the CLB for all three units will be identical. Consultant Leitch asked if this implies that the EPU modifications have no impact on the CLB. TVA stated that the EPU modifications don't impact the CLB as far as license renewal is concerned. If the LRA was submitted at EPU conditions and approved, it would be an implicit approval of an EPU.

Chairman Bonaca stated that the intent of the license renewal rule is that significant plant-specific operating experience be available to support LRAs. In order to compensate for the lack of operating experience for Unit 1, TVA has applied operating experience from Units 2 and 3 to Unit 1 and committed to perform periodic inspections. Member Shack added that operating experience from all BWRs are applicable to BFN Unit 1 and the periodic inspections address a concern that a degradation mechanism could exist in BFN Unit 1 that is not present in any other unit. TVA stated that no new materials have been introduced into Unit 1 that were not already used in the other units and they are working with the staff to document these issues in the final SER.

Consultant Leitch asked TVA about ownership of the AMPs. TVA stated that the AMPs are owned by the operating staff and not a separate license renewal organization. The staff added that part of the followup inspection will be to review TVA's program to transfer ownership of AMPs.

Consultant Barton asked about the maintenance rule requirements for Unit 1. TVA stated that all of the preventive maintenance, inspections, and calibrations will be entered into their Maintenance Rule Program so the maintenance rule can be implemented prior to restart.

Consultant Leitch asked about the emergency equipment cooling water drains that were plugged with debris. The emergency equipment cooling water passes through these catch basins on its way out of the plant. The staff found these basins partially plugged but concluded that the basins could still serve their intended function. TVA took corrective actions to address this problem.

Chairman Bonaca and Consultant Leitch asked about the fuel for Unit 1. TVA stated that the core will consist of new GE fuel with some once and twice burned fuel from Unit 2.

In response to a question from Member Shack, TVA stated that Unit 3 was restarted such that it was identical to Unit 2.

Aging Management

Consultants Leitch and Barton asked why there is no AMP for fuse holders. TVA stated that they examined 14,000 fuses and determined that there were no aging effects that required management. In addition, the procedures and maintenance activities at BFN do not require the removal and reinstallation of many fuses. A review of their operating experience over the last five years showed that only three fuses had been pulled. The staff accepted TVA's justification that an AMP for fuse holders is not needed.

Consultant Leitch asked about the status of the AMPs that have not been fully developed. TVA stated procedures have been developed and are currently being reviewed.

Chairman Bonaca noted that inspection results may identify additional work that would have to be put into AMP procedures and asked how differences among the units would be addressed. TVA responded that differences would be addressed in the implementing guidelines. For example, the conditions of the vessel internals are different for each unit, but the BWR inspection and repair guidelines determine what will be done for each condition.

Consultant Barton asked why so many components were covered by the One-Time Inspection Program. TVA responded that the LRA and SER are confusing because three different kinds of inspections are referred to as one-time inspections. These include restart inspections for Unit 1 recovery, baseline inspections for the Unit 1 Periodic Inspection Program, and one-time inspections for license renewal.

In response to a question from Chairman Bonaca, TVA stated that a description of the Unit 1 Periodic Inspection Program has already been submitted to the staff for their review. Chairman Bonaca stated that as much detail as possible should be provided to the staff for documentation in the final SER. Consultant Leitch added that this program should also consider issues that are related more to age than to wear. Chairman Bonaca agreed that it is appropriate for this program to perform at least three inspections.

Chairman Bonaca noted that the SER documents several problems with the Unit 1 Layup Program. TVA stated that these problems occurred during the initial implementation of the layup program and have been corrected.

Chairman Bonaca agreed with TVA's statement that the Unit 1 Layup Program was not relied upon **as the sole basis** for justifying the acceptability of a component for restart.

Consultant Barton asked about the layup conditions of the secondary side of the main condensers. TVA responded that this condenser was open to atmosphere. The condenser tubes were replaced with stainless steel and will be inspected prior to restart.

Consultant Barton asked about the open item related to inspection of the residual heat removal service water piping. The staff requested that TVA inspect these pipes. Since these pipes are embedded, this inspection would have to be done visually from the inside of the pipe. TVA does not agree that a visual inspection is needed because corrosion inhibitors and biocides are injected immediately upstream to these pipes.

Consultant Barton asked why the staff accepted an 18-month inspection interval for carbon dioxide fire protection systems when the GALL Report recommends an 12-month inspection interval. The staff responded that the 18-month interval is acceptable because it is in the plant's CLB.

In response to a question from Consultant Barton, TVA stated that no cracks have been found in the upper core plates.

Consultant Leitch asked what is done to protect the upper core plate from intergranular stress corrosion cracking. TVA stated that noble metals with hydrogen water chemistry is used to protect the core plate and all the core internals.

Consultant Leitch stated that the Committee is concerned about the high work load involved with commitments to implement AMPs prior to entering the period of extended operation. TVA stated that the schedule for implementing the AMPs is still being developed but a draft schedule would be provided to the Committee during their review of the final SER in March 2006.

TLAAs

The fluences used for the neutron embrittlement TLAAs are based on 54 EFPY for Unit 1 and 52 EFPY for Units 2 and 3. Consultant Leitch noted that these values demonstrate significant margin. TVA stated that different assumptions led to the different EFPYs. For Unit 1 a capacity factor of 85% was assumed for the first 40 years of operation. For Units 2 and 3 a capacity factor of 80% was assumed for the first 40 years of operation.

Member Shack asked why TVA assumed that the irradiated USE values were below the 50 ft-lb requirement. The staff stated that the unirradiated USE values for these materials are not available so TVA was unable to calculate the irradiated value.

Consultant Leitch asked about the TLAA associated with dose to seal rings. The staff stated that the seal rings are for valves in the high pressure coolant injection system and the reactor core isolation system. TVA added that this is no longer a TLAA because tests are performed on these components to check for unacceptable degradation.

Inspections

Chairman Bonaca asked about overlap in the Region's inspections for restart and license renewal. The staff stated that different inspectors were used for the restart and license renewal inspections at BFN.

Chairman Bonaca asked about the timing of the Region's followup inspections for license renewal. The staff responded that the inspections are done to support NRR's schedule but the time of the followup inspection hasn't been determined.

Member Sieber asked how the Unit 1 recovery efforts differ from constructing a new plant. From the Region's perspective the scope of inspections is much smaller for recovery than for new construction. The modifications associated with the restart apply to just a small subset of a system and not the entire system so there is less to verify. In addition, TVA used their normal design change process which is familiar to inspectors. For new construction inspectors would be looking at things for the first time.

In response to a question from Consultant Leitch, the staff stated that no large transient tests are planned for Unit 1.

Subcommittee Decisions and Follow-up Actions

The Subcommittee Chairman will summarize the discussions to the full Committee during the October 2005 ACRS meeting and recommend whether an interim letter be issued.

Background Materials Provided to the Committee

1. Tennessee Valley Authority, "Browns Ferry Nuclear Plant (BFN) - Units 1, 2, and 3 - Application for Renewed Operating Licenses," December 31, 2003
2. Tennessee Valley Authority, "Browns Ferry Nuclear Plant (BFN) - Units 1, 2, and 3 - January 28, 2004 Meeting Follow-Up - Additional Information," February 19, 2004
3. U.S. Nuclear Regulatory Commission, "Safety Evaluation Report with Open Items Related to the License Renewal of the Browns Ferry Nuclear Plant, Units 1, 2, and 3," August 2005
4. Brookhaven National Laboratory, "Audit and Review Report for Plant Aging Management Programs (AMPs) and Aging Management Reviews (AMRs), Browns Ferry Nuclear Plant Units 1, 2, and 3," April 26, 2005
5. U.S. Nuclear Regulatory Commission, "Browns Ferry Nuclear Plant - Inspection Report 05000259/2004012, 05000260/2004012, and 05000296/2004012," January 27, 2005
6. U.S. Nuclear Regulatory Commission, "10 CFR Parts 2, 50, 54, and 140, Nuclear Power Plant License Renewal," *Federal Register*, Vol. 54, No. 240, December 13, 1991, pp. 64943-64980
7. U.S. Nuclear Regulatory Commission, "10 CFR Parts 2, 51, and 54, Nuclear Power Plant License Renewal; Revisions," *Federal Register*, Vol. 60, No. 88, May 8, 1995, pp. 22461-22495

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NOTE:
Additional details of this meeting can be obtained from a transcript of this meeting available in the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Rockville, MD, (301) 415-7000, downloading or view on the Internet at http://www.nrc.gov/reading-rm/doc-collections/acrs/ can be purchased from Neal R. Gross and Co., 1323 Rhode Island Avenue, NW, Washington, D.C. 20005, (202) 234-4433 (voice), (202) 387-7330 (fax), nrgross@nealgross.com (e-mail).

****

the above conditions upon demonstration by Mr. Myers of good cause.

V

In accordance with 10 CFR 2.202, John Myers must, and any other person adversely affected by this Order may, submit an answer to this Order, and may request a hearing on this Order, within 20 days of the date of this Order. Where good cause is shown, consideration will be given to extending the time to request a hearing. A request for extension of time must be made in writing to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and include a statement of good cause for the extension. The answer may consent to this Order. Unless the answer consents to this Order, the answer shall, in writing and under oath or affirmation, specifically admit or deny each allegation or charge made in this Order and shall set forth the matters of fact and law on which Mr. Myers or other person adversely affected relies and the reasons as to why the Order should not have been issued. Any answer or request for a hearing shall be submitted to the Secretary, U.S. Nuclear Regulatory Commission, Attn: Rulemakings and Adjudications Staff, Washington, DC 20555. Copies also shall be sent to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555, to the Assistant General Counsel for Materials Litigation and Enforcement at the same address, to the Regional Administrator, NRC Region I, 475 Allendale Road, King of Prussia, Pennsylvania, and to Mr. Myers if the answer or hearing request is by a person other than Mr. Myers. Because of continuing disruptions in delivery of mail to United States Government offices, it is requested that answers and requests for hearing be transmitted to the Secretary of the Commission either by means of facsimile transmission to 301–415–1101 or by e-mail to *hearingdocket@nrc.gov* and also to the Office of the General Counsel either by means of facsimile transmission to 301–415–3725 or by e-mail to *OGCMailCenter@nrc.gov*. If a person other than Mr. Myers requests a hearing, that person shall set forth with particularity the manner in which his interest is adversely affected by this Order and shall address the criteria set forth in 10 CFR 2.309.

If a hearing is requested by Mr. Myers or a person whose interest is adversely affected, the Commission will issue an Order designating the time and place of any hearing. If a hearing is held, the issue to be considered at such hearing shall be whether this Order should be sustained.

Pursuant to 10 CFR 2.202(c)(2)(I), Mr. Myers, may, in addition to demanding a hearing, at the time the answer is filed or sooner, move the presiding officer to set aside the immediate effectiveness of the Order on the ground that the Order, including the need for immediate effectiveness, is not based on adequate evidence but on mere suspicion, unfounded allegations, or error.

In the absence of any request for hearing, or written approval of an extension of time in which to request a hearing, the provisions specified in Section IV above shall be final 20 days from the date of this Order without further order or proceedings. If an extension of time for requesting a hearing has been approved, the provisions specified in Section IV shall be final when the extension expires if a hearing request has not been received. An answer or a request for hearing shall not stay the immediate effectiveness of this order.

For the Nuclear Regulatory Commission.

Dated this 9th day of September 2005.

Martin J. Virgilio,

Deputy Executive Director for Materials, Research, State and Compliance Programs, Office of the Executive Director for Operations.

[FR Doc. 05–18797 Filed 9–20–05; 8:45 am]

BILLING CODE 7590–01–P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards

Meeting of the Subcommittee on Plant License Renewal; Notice of Meeting

The ACRS Subcommittee on Plant License Renewal will hold a meeting on October 5, 2005, Room T–2B3, 11545 Rockville Pike, Rockville, Maryland.

The entire meeting will be open to public attendance.

The agenda for the subject meeting shall be as follows:

Wednesday, October 5, 2005—12:30 p.m. until 5 p.m.

The purpose of this meeting is to discuss the License Renewal Application and associated Safety Evaluation Report (SER) with Open Items related to the License Renewal of the Browns Ferry Nuclear Plant, Units 1, 2, and 3. The Subcommittee will hear presentations by and hold discussions with representatives of the NRC staff, the Tennessee Valley Authority, and other interested persons regarding this matter. The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

Members of the public desiring to provide oral statements and/or written comments should notify the Designated Federal Official, Mr. Cayetano Santos (telephone 301/415–7270) five days prior to the meeting, if possible, so that appropriate arrangements can be made. Electronic recordings will be permitted.

Further information regarding this meeting can be obtained by contacting the Designated Federal Official between 7:30 a.m. and 4:15 p.m. (e.t.). Persons planning to attend this meeting are urged to contact the above named individual at least two working days prior to the meeting to be advised of any potential changes to the agenda.

Dated: September 14, 2005.

Michael L. Scott,

Branch Chief, ACRS/ACNW.

[FR Doc. 05–18799 Filed 9–20–05; 8:45 am]

BILLING CODE 7590–01–P

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards

Subcommittee Meeting on Planning and Procedures; Notice of Meeting

The ACRS Subcommittee on Planning and Procedures will hold a meeting on October 5, 2005, Room T–2B1, 11545 Rockville Pike, Rockville, Maryland.

The entire meeting will be open to public attendance, with the exception of a portion that may be closed pursuant to 5 U.S.C. 552b(c) (2) and (6) to discuss organizational and personnel matters that relate solely to the internal personnel rules and practices of the ACRS, and information the release of which would constitute a clearly unwarranted invasion of personal privacy.

The agenda for the subject meeting shall be as follows:

Wednesday, October 5, 2005, 10 a.m.–11:30 a.m.

The Subcommittee will discuss proposed ACRS activities and related matters. The Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate, for deliberation by the full Committee.

Members of the public desiring to provide oral statements and/or written comments should notify the Designated

Advisory Committee on Reactor Safeguards
Plant License Renewal Subcommittee Meeting
Browns Ferry Nuclear Plant, Units 1, 2, and 3
October 5, 2005
Rockville, MD

-PROPOSED SCHEDULE-

Cognizant Staff Engineer: Cayetano Santos Jr. CXS3@NRC.GOV (301) 415-7270

Topics	Presenters	Time
Opening Remarks	M. Bonaca, ACRS	12:30 pm - 12:35 pm
Staff Introduction	P.T. Kuo, NRR	12:35 pm - ~~12:40 pm~~ 1250
Browns Ferry License Renewal Application A. Application Background B. Description of Browns Ferry C. Operating History D. Unit 1 Layup E. Scoping Discussion F. Application of GALL G. Commitment Process	R. DeLong, TVA	~~12:40 pm~~ - ~~2:15 pm~~ 1250 210
Break	210	~~2:15~~ pm - 2:30 pm
SER Overview A. Scoping and Screening Results B. Aging Management Program Review and Audits	R. Subbaratnam, NRR	2:30 pm - ~~3:00~~ pm 250 250 300
Time-Limited Aging Analyses	Y. Diaz Sanabria, NRR	~~3:00~~ pm - ~~3:30~~ pm
Onsite Inspection Results A. License Renewal B. Unit 1 Inspections	C. Julian, Region II S. Cahill, Region II	~~3:30~~ pm - ~~4:30 pm~~ 300 400
Subcommittee Discussion	M. Bonaca, ACRS	~~4:30~~ pm - ~~5:00~~ pm 400 420

NOTE:

- Presentation time should not exceed 50 percent of the total time allocated for a specific item. The remaining 50 percent of the time is reserved for discussion.
- 50 copies of the presentation materials to be provided.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

October 5, 2005
Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME	NRC ORGANIZATION
Yoira Diaz Sanabria	NRR/RLEP
Ram Subbaraman	NRR/RLEP
Y.C. (Renee) Li	NRR/DE/EMEB
K. Parczewski	NRR/DE/EMCB
R. Auluck	NRR/RLEP
Richard McNally	NRR/DE/EMEB
Margaret Chernoff	NRR/DLPM/PDII-2
Ann Hodgdon	OGC/RP
DAN MERZKE	NRR/DRIP/RLEP
Stephen Cahill	RII/DRP
Eva Brown	NRR/DLPM/PII-2
CAUDLE JULIAN	NRC REGION II
Kiyoto Tanabe	NRR/RLEP/Japanese Assignee MSA
Jake Zimmerman	NRR/DRIP/RLEP-B
GREG CRANSTON	NRR/DRIP/RLEP-B
Michael Marshall	NRR/DLPM
Cheng-Yang Li	NRR/DSSA/SPLB
S.K. MITTAL	NRR/DRIP/RLEP
S. Hoffman	NRR/DRIP/RLEP
A. Pal	NRR/DE/EEIB

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

October 5, 2005
Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME	NRC ORGANIZATION
Bill Rogers	NRR/DIPM
Hans Asahar	NRR/DE/EMEB
Kurt Cozens	NRR/DRIP/RLEP-B
David Jeng	NRR/DE/EMEB
Ganesh Cheruvenki	NRR/DE/EMCB
Lambros Lois	NRR/DSSA/SRXB
Arnold Lee	NRR/DE/EMEB
Johnny Eads	NRR/DRIP/RLEP
Ken Chang	NRR/DRIP/RLEP
Jin-Sien Guo	NRR/DSSA/SPLB
R. Pettis	NRR/DIPM
NAEEM IQBAL	NRR/DSSA/SPLB
Jonathan Rowley	NRR/DRIP/RLEP
MARK HARTZMAN	NRR/DE/EMEB

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

October 5, 2005
Date

NRC STAFF SIGN IN FOR ACRS MEETING

PLEASE PRINT

NAME	NRC ORGANIZATION
J.H. RAVAL	DSSA/ NRR/SPLB-C
HAROLD WALKER	DSSA/NRR/SPLB-C
Jeremy Tapp	~~DSSA/~~ DLPM/PDII-2
BARRY ELLIOT	NRR/DE/EMCB
Matthew A Mitchell	NRR/DE/EMCB
Jim Tsao Ku	RES/PRAB
P T KUO	NRR/RLEP
Tommy Le	NRR/RLEP

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

October 5, 2005
Date

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NAME	AFFILIATION
KEVIN L. GROOM	U.S. TVA
KATHRYN SUTTON	MORGAN LEWIS
Paul Crowley	STARS - Ariz. Pub. Serv.
Bill Crouch	TVA
David Burrell	TVA
Joe Valente	TVA
RICH DELONG	TVA
Robert J. Moll	TVA
Henry L. Jones	TVA
Joe McCarthy	TVA
Roger B. Rucker	First Energy
STEVEN DORT	FIRST ENERGY - BEAVER VALLEY
Kenneth A. Brune	TVA
Roger Jennings	TVA
Mickey Hamby	TVA
Don Arp	TVA
Eric Blocher	Parsons
Russell Jansen	TVA
Michael Heath	PGN
Kim Green	ISL, Inc.

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE MEETING ON PLANT LICENSE RENEWAL

October 5, 2005
Date

PLEASE PRINT

NAME	AFFILIATION
Lenny Beller	Licensing - Progress Energy
MARK GRANTHAM	ENGINEERING- PROGRESS ENERGY

Browns Ferry Nuclear Plant
Units 1, 2, and 3
License Renewal
Safety Evaluation Report

Staff Presentation to the ACRS Subcommittee
Ram Subbaratnam, and
Yoira Diaz Sanabria, Project Managers
Office of Nuclear Reactor Regulation
October 5, 2005

Review Highlights

- **License extension request – December 31, 2003**
  - Unit 1: December 20, 2013
  - Unit 2: June 28, 2014
  - Unit 3: July 2, 2016
- **SER with Open and Confirmatory Items issued on August 9, 2005**
- **Two (2) Open Items**
  - 1 Scoping and Screening: OI 2.4-3
  - 1 Time-limited aging analysis: OI 4.7.7
- **Three (3) Confirmatory Items**
- **Four (4) License Conditions; Three Standard and one specific to BFN**
- **Fourth Condition requires completion of Unit 1 CLB differences (13 Items) described in LRA Appendix F**

Section 2.1: Scoping and Screening Methodology – Seismic Anchorage

- BFN revised the current methodology for supports/equivalent anchors within the scope for 10 CFR 54.4(a)(2) for the cases where NSR piping or components are directly connected to SR piping or components.

- Result: Brought new portions of piping, components of existing systems, and two additional structures within the scope of license renewal

Section 2.1: Scoping and Screening Methodology Secondary Containment Integrity

- Seismic qualification of containment penetration seals and the associated piping and supports outside of the secondary containment.

- Staff requested BFN identify any additional piping, supports, and other components outside secondary containment that are required to maintain the structural integrity of the secondary containment

- BFN verified that a few mechanical systems only had systems boundary changes

Section 2.4: Scoping and Screening of Containments, Structures and Supports

Open Item 2.4-3 Drywell Shell Corrosion

- Potential Corrosion of the inaccessible portion of the Drywell affected by the leakage from the refueling cavity seal

- The staff proposed two options:

  (1) Bring the refueling cavity seal in the scope of LR or
  (2) Periodically monitor the potential degradation of the inaccessible side of the dry well

Section 2.5: Scoping and Screening of Electrical and I&C Systems

- Scoping and screening I&C components performed using the spaces approach

- BFN excluded SRM and IRM circuit cables from the LR scope

- Resolution: IRM circuits brought into scope and managed by suitable AMP

Section 2.6: Integration of BFN Unit 1 Restart Activities and LR Activities

- Unit 1 CLB differences (13 Items) described in LRA Appendix F
- LRA review performed under a regulatory framework
- Standard Aging Management Review of components identified in the bold border boxes
- License condition ensures implementation of all changes

Section 2.7: Conclusion for Scoping and Screening

- On the basis of its review, the staff concluded, pending resolution of OI 2.4-3, that the applicant had adequately identified those systems and components that are within the scope of license renewal, as required by 10 CFR 54.4(a), and those systems and components that are subject to an AMR, as required by 10 CFR 54.21(a)(1).

Section 3.0: Aging Management Program (AMP)

- **Total of 39 Aging Management Programs**
  - 38 are common for all three units
  - 1 specific to Unit 1 (i.e., Unit 1 Periodic Inspection Program)
  - 6 New Programs
  - 4 Plant-Specific Programs

Section 3.0: Overhead Heavy Load and Light Load Handling Systems Program

- Exception to Inspection of Overhead Heavy Load and Light Load Handling Systems Program
  - Program does not monitor for crane fatigue
  - Reactor building crane fatigue was evaluated as a TLAA
  - The TLAA remains valid through extended period of operation and hence fatigue monitoring not required

Section 3.0: Buried Piping and Tanks Inspection Program

- Applicant relied solely on opportunistic inspections to check buried piping.

- The applicant agreed to inspect the buried piping within 10 yrs after entering the PEO, unless conclusive opportunistic inspections have occurred within the 10-yr period.

- If not, the applicant committed to perform a focused inspection

Section 3.0: Aboveground Carbon Steel Tanks Program

- The staff identified that the AMP does not perform thickness measurements of fuel oil tanks' bottom surface

- The applicant revised One-Time Inspection Program to require ultrasonic thickness measurements

Section 3.3: Aging Management Review (AMR) – Auxiliary Systems

Confirmatory Item 3.3.2.35-1

- Loss of preload and cracking of bolting in the auxiliary system
  - Staff required confirmation and results of any self assessments, inspections or maintenance activities on the auxiliary system bolting
  - Region II AMR inspection verified the confirmatory item in a recently concluded Inspection .
  - Disposition in inspection report to be issued in November 2005.

Section 3.5 AMR of Civil Structures and Components

- Aging Management of Inaccessible Areas
  - Inspection of Inaccessible concrete structures
  - Results of Browns Ferry groundwater and Wheeler Reservoir water sampling indicated a non-aggressive environment

Parameter	Groundwater	Wheeler Reservoir	Acceptable Limit
pH ranges	6.33- 8.77	7.28- 8.64	> 5.5
Chlorides (ppm)	18.3	13.9	< 500
Sulfates (ppm)	30.3	15.5	<1500
Phosphates (max. ppm)	0.5	0.5	---

Section 3.7: AMR of Unit 1 Systems in Lay Up

- The applicant does not rely solely on Unit 1 Lay up Program during the extended outage
  - Staff needed confirmation that no new degradation occurred in extended outage
  - Resolution: The applicant committed to Unit 1 periodic inspection that will be conducted through the extended period

Section 3.7: AMR of Unit 1 Systems in Lay Up

Confirmatory Item 3.0-3 LP

- Unit 1 Periodic Inspection Program
  - BFN submitted Unit 1 Periodic Inspection Program
  - Staff in reviewing the Program element needed additional confirmation.
  - Section 3.0 of the final SER will include the staff evaluation of this program

Section 3.8: Conclusion of AMR and AMP

- On the basis of its review of the AMR results and AMPs, the staff concluded that the applicant had demonstrated that the aging effects will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10 CFR 54.21(a)(3).

Section 4: Time Limited Aging Analyses (TLAAs)

- Reactor Vessel and Internals Neutron Embrittlement
- Metal Fatigue
- Environmental Qualification
- Primary Containment Fatigue
- Other Plant-Specific Analyses

Section 4.2: Reactor Vessel and Internals Neutron Embrittlement

- **Upper Shelf Energy (USE)**
  - Vessel beltline USE values were assumed to be less than the 10 CFR 50, Appendix G criteria.
  - Equivalent margin analysis (generic) provides bounding USE value based on copper and fluence values
  - Staff performed independent analysis and confirmed applicant's conclusion
  - Analysis projected through end of PEO operation pursuant to 10 CFR 54.21(c)(1)(ii)

Section 4.2: Reactor Vessel and Internals Neutron Embrittlement

- Adjusted Reference Temperature (ART)

Parameter	Unit 1	Unit 2	Unit 3
ART	159°F	157°F	157°F
USE (35 ft-lb for EMA)	45 ft-lb	45 ft-lb	45 ft-lb

Section 4.3: Metal Fatigue

- **Reactor Coolant Environmental Effects**
  - CUF of some components are projected to exceed the ASME Section III Class 1 limit before the end of PEO
  - Effects of aging on the intended functions at these locations will be managed in accordance with 10 CFR 54.21 (c)(1)(iii) as part of the Fatigue Monitoring Program.

Section 4.7: Other Plant-Specific Analyses

- Reactor Building Crane Load Cycle
- Dose to Seal Rings: High Pressure Coolant Injection and Reactor Core Isolation
- Radiation Degradation of Drywell Expansion Gap Foam
- IASCC of Reactor Vessel Internals
- Stress Relaxation of Core Plate Hold-down Bolts
- EECW Weld Flaw Evaluation

Section 4.7.7: Stress Relaxation Core Plate Hold-Down Bolts

- TLAA evaluated for loss of pre-load in accordance with 10 CFR 54.21 (c)(1)(ii)

- Expected loss of preload of 20% which bounds the original BWRVIP-25 value

- In a plant specific analysis
  - Core plate hold-down bolts will maintain sufficient preload to prevent sliding of core plate
  - Hold-down bolts meet ASME Section III, Class 1, Level D service limits at the end of PEO

Section 4.7.7: Stress Relaxation Core Plate Hold-Down Bolts

- Open Item 4.7.7
  - The staff reviewed the method of analysis based on GE's generic stress relaxation data on irradiated stainless steel materials
  - The staff requested additional information to address
    - Horizontal and vertical loads for all operating conditions during PEO
    - Sliding of core plate from core plate rim during extended period of operation
    - Axial and bending stresses of bolts

Section 4.8: Conclusion of TLAAs

- The staff reviewed the information in LRA Section 4 and on the basis of its reviewed concluded that, subject to resolution of OI 4.7.7, the applicant has provided an adequate analysis of TLAAs.

Browns Ferry Nuclear Plant
Units 1, 2, and 3
License Renewal
Safety Evaluation Report

Caudle Julian, Senior Project Manger

DRP, Region II

License Renewal Inspection Program Implementation

- License renewal manual chapter - MC 2516
- License renewal inspection procedure - IP 71002
- Site-specific inspection plan for each applicant
- Scheduled to support NRR's review
- Resources - consistent team of the same five inspectors
- Training program for replacement team members

Scoping and Screening Inspection

- Objective: To confirm that the applicant has included all appropriate SSCs in the scope of License Renewal as required by the Rule

- MC 2516 and IP 71002 have been revised to reduce the scope of Scoping and Screening inspections and combine them with Aging Management Program inspections

- Focus is on 10 CFR 54.4 (a) (2) situations - non safety related that could effect safety related equipment

Aging Management Programs Inspection

- Objective: To confirm that existing AMPs are working well and to examine the applicant's plans for establishing new AMPs and enhancing existing AMPs
- Two weeks in length
- Examine records of past tests and surveillances from existing AMPs, and examine the implementation plans for new or expanded AMPs
- Verify inclusion of future tasks into established site task tracking system
- Verify that material condition of plant was being adequately maintained to date

Additional (Optional) Inspection: Open Items

- 2 - 3 days in length
- Close any open items from previous inspections
- Close any inspection items requested by NRR
- Verify that applicant has loaded future tasks into established site task tracking system
- Verify that a transition plan for completion of license renewal project was established

Browns Ferry License Renewal Inspection

- AMP inspection conducted November 29 - December 17, 2004
- Inspection concluded that existing programs to be credited as aging management programs for license renewal are generally functioning well.
- Inspectors observed that the applicant had not yet begun the implementation process for new and enhanced AMPs
- AMP procedures have yet to be defined and composed

Browns Ferry License Renewal Inspection

- For existing programs, the identification and selection of which particular existing procedures constitute the AMP had yet to be done

- Region II concluded that NRC will perform another inspection when the applicant has progressed further with AMP implementation.

- 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.

Browns Ferry License Renewal Inspection

Second (optional) AMP Inspection

- Conducted September 19 - 23, 2005

- Reviewed sample of 40 AMP Implementation Packages containing proposed procedures

  - Packages contained some errors and were not meticulously reviewed

  - Applicant initiated PER for corrective action

Browns Ferry License Renewal Inspection

Second (optional) AMP Inspection (cont.)

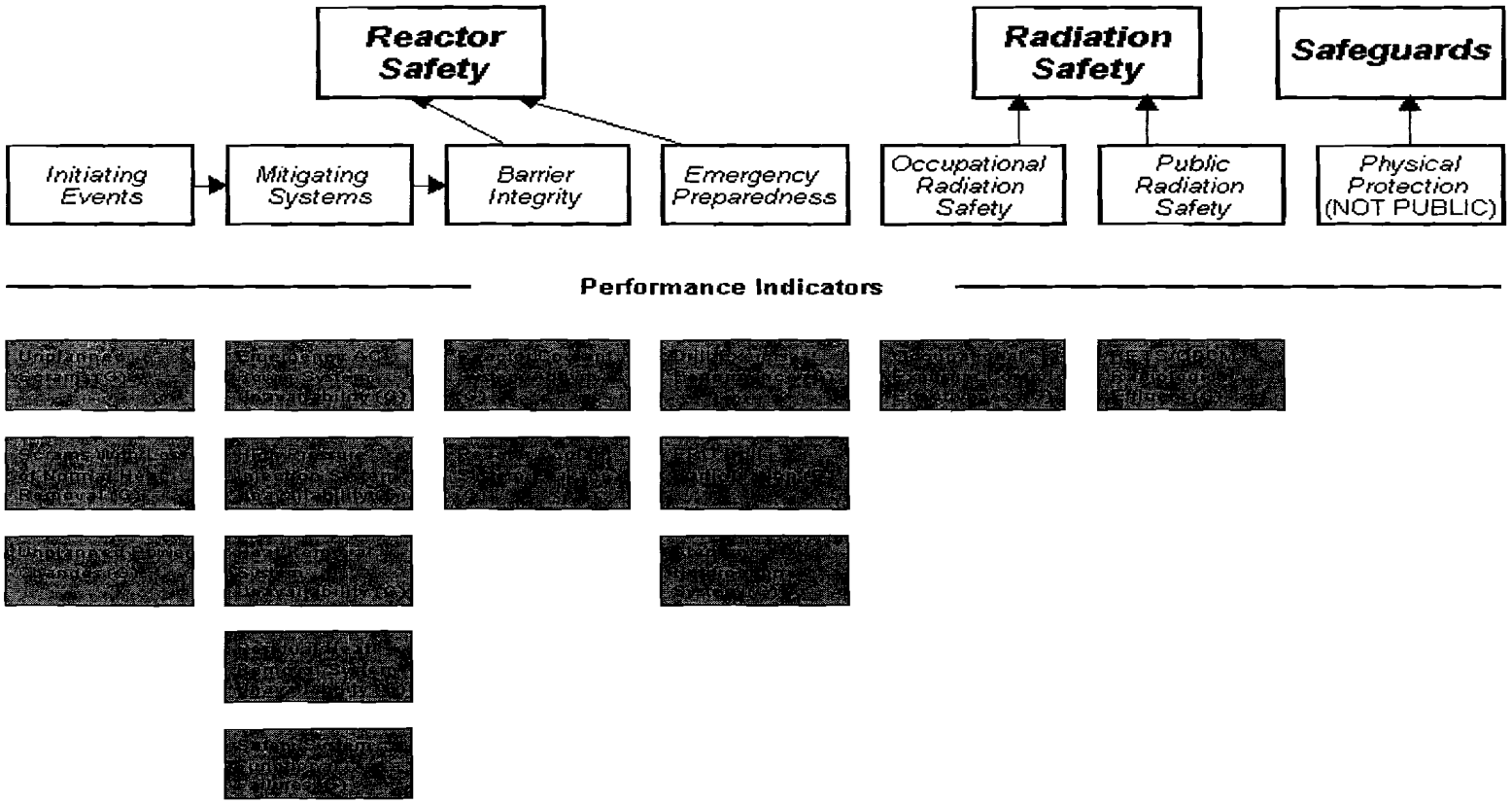
- Reviewed plans for tracking future actions using TROI system

  - Not initially linked to Implementation Packages but quickly corrected
  - Inspection sample commitments were included
  - Much duplication and varying format resulting in confusing document

- Applicant decided to track future actions using PER process

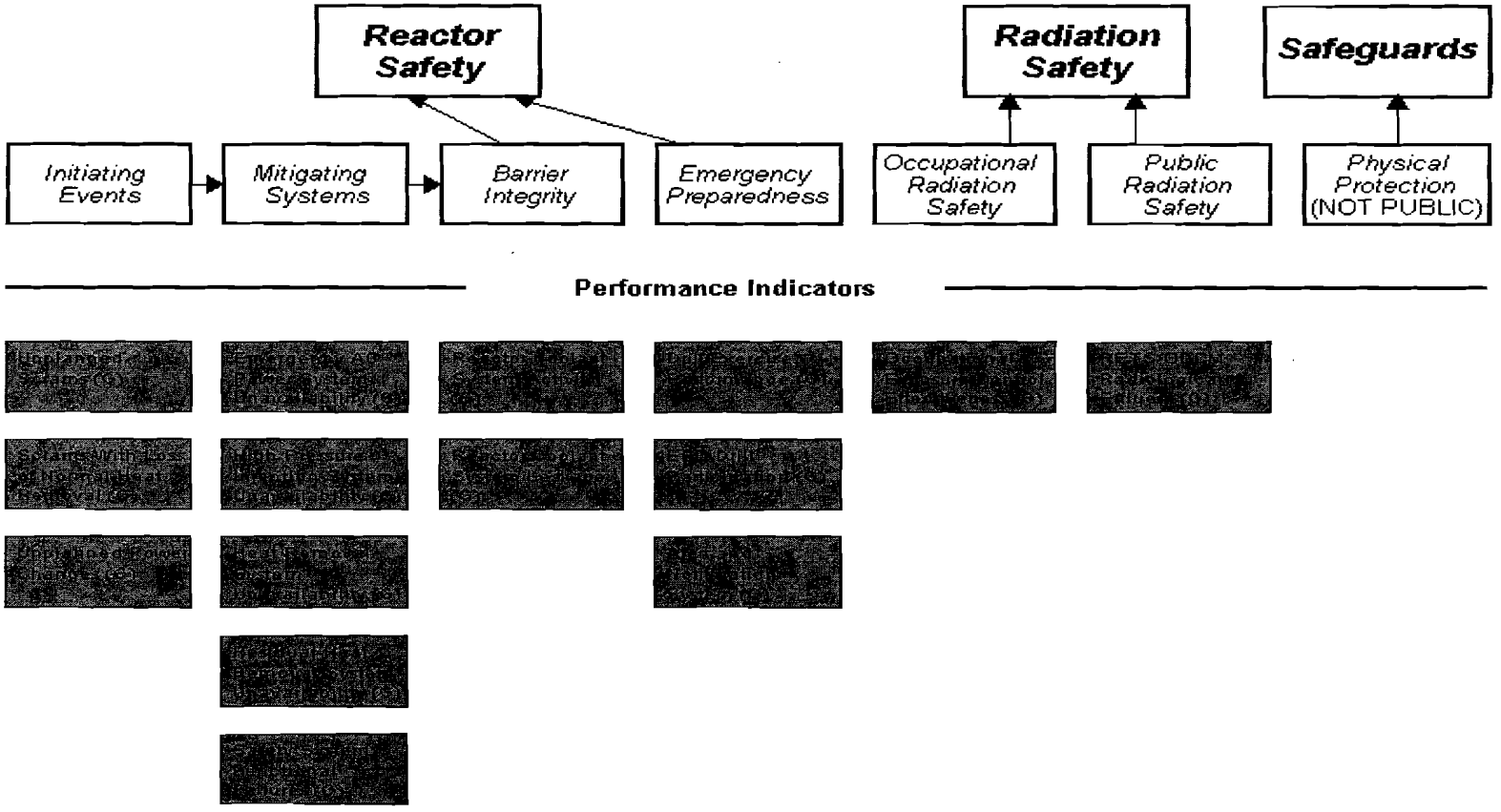
- Region II will follow up on these issues during a future inspection

Browns Ferry 2
2Q/2005 Performance Summary



Last Modified: August 3, 2005

Browns Ferry 3
2Q/2005 Performance Summary



Last Modified: August 3, 2005

Conclusion

- Region II concluded that NRC will perform another inspection when the applicant has progressed further with AMP implementation.

- 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.

Browns Ferry Nuclear Plant Units 1, 2, and 3 Inspection and Oversight Activities

Stephen Cahill, Chief
DRP, Region II

NRC OVERSIGHT FRAMEWORK

- **Initial NRC perspective & considerations**
  - Unit 2 & 3 recovery experience

- **Need established for unique NRC Manual Chapter (MC)**
  - ROP implemented since Unit 2 & 3 recoveries
  - TVA using existing normal change processes

- **Several other considerations creating need for a MC**
  - No need to re-verify adequacy of fixes to programs
  - Focus inspections on just program implementation

NRC OVERSIGHT FRAMEWORK

- **MC 2509 issued in August 2003**

  - Specific to oversight of Unit 1 Recovery
  - Conscious decision not to test new construction approaches
  - Final draft shared as public document

- **Key attributes of MC 2509**

NRC OVERSIGHT FRAMEWORK

- **Regulatory Framework established**

  - TVA letters in 2002 & 2003 to establish U1 restart scope
  - NRC issued a final Regulatory Framework agreement on August 14, 2003

- **Inspection Plan**

  - Unlike system based new construction program
  - Based on Reg. Framework and Recovery Issues List

INSPECTION PLAN

- **Schedule now primarily driven by Recovery Issues List status**

  - Original focus was equipment removal and engineering
  - List first issued as public document in July 2005
  - TVA provides detailed Quarterly Status Update
  - Inspections targeted when program complete and substantial physical work done

- **System turnover to Operations process - SPOC**

- **ROP Cornerstone Transition**
  - Cornerstone (CS) Transition Matrix
  - Four CS's into ROP approach as of January 1, 2005

- **Significant Modifications or Verifications**
  - Inspecting safety-significant items

INSPECTION APPROACH

- **Ownership of Recovery List Items**
  - All assigned a lead
  - Use of new inspectors factored in to assignments

- **Quarterly Integrated Reports**
  - Documentation threshold

- **Focus of Inspections**
  - Review any applicable inspection procedures for reference
  - Review issue background & references
  - Identify any differences from Unit 2 & 3 resolution
  - Review differences in detail
  - Sample TVA's implementation

INSPECTION APPROACH

- **Final Phases of Recovery**

  - System adequacy testing focus: risk informed sampling

  - Operational Readiness Assessment Team inspection

  - Will apply our "routine" oversight of extended shutdown plant restart

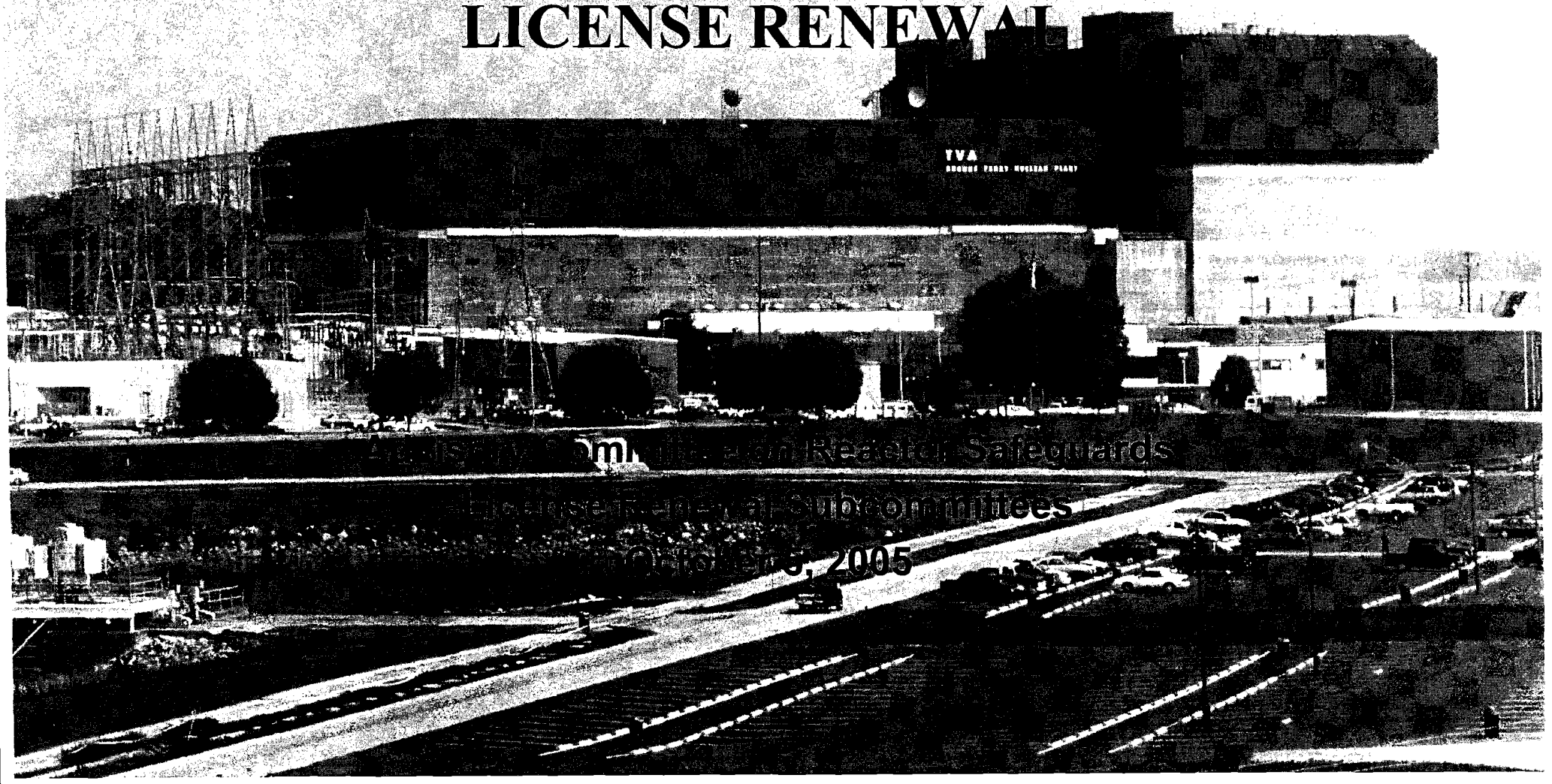
CURRENT PLANS

- **Restart Oversight Panel Charter ready for final signature**
  - Planning in progress for initial meeting
- **Planning for sampling inspections of System Recoveries**
- **Incorporating License Renewal and EPU open items**
  - Will track in Unit 1 Recovery Issues List where appropriate
- **Review of Restart Test Program underway**

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT

TVA

LICENSE RENEWAL



Advisory Committee on Reactor Safeguards
License Renewal Subcommittee
October 6, 2005

Agenda

- Description of Browns Ferry
- BFN License Renewal Application
  - Scoping
  - Time-Limited Aging Analysis
  - Aging Management Programs
- Unit 1 Layup
- Unit 1 Operating Experience
- License Renewal Commitments
- Open Items

Description of Browns Ferry

- All Three BFN Units are General Electric BWR 4 Reactors with Mark I Containments
- Approximate Years of Operation
  - Unit 1 – 10
  - Unit 2 – 23
  - Unit 3 – 18
- BFN Units 2 and 3 in Operation Since Recovery in 1991 and 1995, Respectively
- Unit 1 in Recovery Outage with Restart Scheduled for May 2007
  - Unit 1 will be operationally identical to Units 2 and 3
- NRC Performance Indicators Green

BFN License Renewal Application

- Three-Unit Application Submitted December 31, 2003
- Original License Expiration
  - Unit 1 – December 20, 2013
  - Unit 2 – June 28, 2014
  - Unit 3 – July 2, 2016
- License Renewal Application at Current Licensed Thermal Power for each Unit (Unit 1 – 3293 MWt, Units 2 and 3 – 3458 MWt)
- Appendix F Describes the Differences Between Unit 1 and Units 2 and 3
  - These differences will be eliminated prior to Unit 1 restart (May 2007)
- Requests for Additional Information ~230 (13 are Environmental, Remainder are Safety Evaluation)

Scoping

- Scoping Basis
  - Updated Final Safety Analysis Report
  - Safe Shutdown Analysis calculation
  - Maintenance Rule documentation
  - Controlled Plant Component Database
  - Licensing Basis and Design Basis documents
- Specific Scoping for Regulated Events
  - Fire Protection
  - Environmental Qualification
  - Anticipated Transients Without Scram
  - Station Blackout
- 77 Mechanical / Electrical Systems in Scope

Time-Limited Aging Analysis

- Neutron Embrittlement of the Reactor Vessel and Internals
- Metal Fatigue
- Environmental Qualification of Electrical Equipment
- Primary Containment Fatigue
- Plant Specific Time-Limited Aging Analyses
  - Reactor Building Crane Load Cycles
  - Radiation Degradation of Drywell Expansion Gap Foam
  - Irradiation Assisted Stress Corrosion Cracking (IASCC) of Reactor Vessel Internals
  - Stress Relaxation of the Core Plate Hold-Down Bolts
  - Emergency Equipment Cooling Water Weld Flaw Evaluation

Reactor Vessel
Time-Limited Aging Analysis

- Neutron Embrittlement of the Reactor Vessel and Internals
  - Unit 1: Conservatively evaluated using 54 Effective Full Power Years at Extended Power Uprate conditions
    - Peak fluence of limiting weld 1.95×10^{18} n/cm^2
  - Units 2 and 3: Conservatively evaluated using 52 Effective Full Power Years at Extended Power Uprate conditions
    - Peak fluence of limiting weld 2.3×10^{18} n/cm^2

License Renewal
Aging Management Programs

- 39 Aging Management Programs Total
  - 38 are common to Units 1, 2, and 3
  - 1 is for only Unit 1 (i.e., Unit 1 Periodic Inspection Program)
- 11 Existing Aging Management Programs Requiring No Enhancement
- 11 Existing Aging Management Programs Revised Only to Include Unit 1
- 11 Existing Aging Management Programs Require Enhancement for all Units
- 6 New Aging Management Programs

License Renewal
Aging Management Programs

- Existing Aging Management Programs Requiring No Enhancement
  - 10 CFR 50 Appendix J Program
  - Above ground Carbon Steel Tanks Program
  - ASME Section XI Inservice Inspection Subsections IWB, IWC, and IWD Program
  - ASME Section XI Subsection IWE Program
  - Bolting Integrity Program
  - BWR Control Rod Drive Return Line Nozzle Program
  - Diesel Starting Air Program
  - Fuel Oil Chemistry Program
  - Inspection of Overhead Heavy Load and Light Load Handling Systems Program
  - Reactor Head Closure Studs Program
  - Systems Monitoring Program

License Renewal
Aging Management Programs

- Existing Aging Management Programs Requiring Revision Only to Incorporate Unit 1
  - BWR Feedwater Nozzle Program
  - BWR Penetrations Program
  - BWR Reactor Water Cleanup System Program
  - BWR Stress Corrosion Cracking Program
  - BWR Vessel Inside Diameter Attachment Welds Program
  - Chemistry Control Program
  - Closed-Cycle Cooling Water System Program
  - Environmental Qualification Program
  - Fire Protection Program
  - Flow-Accelerated Corrosion Program
  - Open-Cycle Cooling Water System Program

License Renewal
Aging Management Programs

- Existing Aging Management Programs Requiring Enhancement (All Units)
  - ASME Section XI Subsection IWF Program
  - Buried Piping and Tanks Inspection Program
  - BWR Vessel Internals Program (includes steam dryers)
  - Compressed Air Monitoring Program
  - Electrical cables not subject to 10 CFR 50.49 Environmental Qualification requirements used in Instrumentation Circuits Program
  - Fatigue Monitoring Program
  - Fire Water System Program
  - Inspection of Water-Control Structures Program
  - Masonry Wall Program
  - Reactor Vessel Surveillance Program
  - Structures Monitoring Program

License Renewal
Aging Management Programs

- New Aging Management Programs (for all Three Units)
  - Accessible Non-Environmental Qualification Cables and Connections Inspection Program
  - Bus Inspection Program
  - Inaccessible medium voltage cables not subject to 10 CFR 50.49 Environmental Qualification Requirements Program
  - One-Time Inspection Program
  - Selective Leaching of Materials Program
- New Aging Management Program (Unit 1 Only)
  - Unit 1 Periodic Inspection Program

One-Time Inspection Program

- Applies to Units 1, 2, and 3
- Verifies the Effectiveness of Aging Management Programs by Confirming that Unacceptable Degradation is not Occurring
- Where No Aging Management Program is Identified, the Inspections Confirm either:
  - Aging Effects are not Occurring, or
  - Aging Effects are Occurring at a Rate that does not Affect the Intended Function
- To be Completed Prior to the Period of Extended Operation
- Examples of inspection items:
  - Reactor coolant pressure boundary piping, valves, fittings less than four inches
  - Bottom thickness of above ground tanks
  - Submerged concrete and component supports
  - Ventilation ducts

Unit 1 Periodic Inspection Program

- Periodic Inspections will be Performed after Unit 1 is Returned to Operation to Verify No Additional Aging Effects are Occurring
- The Periodic Inspection Sample Locations will be a Subset of Non-Replaced Piping Locations (takes credit for restart inspections)
- First Round of Periodic Inspections will be Completed Prior to Period of Extended Operation and after Several Years of Unit 1 Operation
- An Inspection will be Performed during the Period of Extended Operation
- Subsequent Inspection Frequency will be Determined Based on Inspection Results

Unit 1 Layup Program

- Criteria
  - EPRI NP-5106, "Sourcebook for Plant Layup and Equipment Preservation", Revisions 0 (1987) and 1 (1992)
- Types of Layup
  - Dry
  - Wet
- Lessons Learned from Unit 3 Layup and Subsequent Restart Applied to Unit 1

Unit 1 Layup Program

- Examples of Systems in Layup
  - Dry

Core Spray	Condensate
Reactor Core Isolation Cooling	Feedwater
High Pressure Coolant Injection	Off Gas
Residual Heat Removal	Main Steam

  - Wet

Reactor Vessel	Control Rod Drive
Recirculation	

- Results Met or Exceeded EPRI Guidelines
- Performed Visual, Surface, Ultrasonic, and Remote Inspections to Assess Unit 1 Condition
- No credit was taken for the lay-up program in determining the acceptability of structures, systems, or components for Unit 1 restart

Unit 1 Operating Experience

- 10 CFR 54.17(c):

  An application for a renewed license may not be submitted to the Commission earlier than 20 years before the expiration of the operating license currently in effect.

- Unit 1 Met this Requirement

- Unit 2 and Unit 3 Operating Experience is Applicable to Unit 1

Unit 1 Operating Experience

- Unit 1 has 10 Years of Operation
- Unit 3 Shutdown for 10 Years
  - Extensive layup experience with Unit 3 directly applicable to Unit 1
  - No layup induced aging effects during 10 years of ensuing operation
- Layup Experience from Unit 3 Incorporated into Unit 1 Recovery
  - RHR service water piping
  - Small bore piping
- Unit 1's Licensing Basis will be the same as that of Unit 2 and Unit 3 at Restart (Appendix F)
- Unit 1's Design, Configuration, Operating Procedures, Technical Specifications, and Updated Final Safety Analysis Report Identical to Unit 2 and Unit 3
- Internal and External Plant Operating Experience Incorporated into BFN Corrective Action Program

License Renewal Commitments

- Commitments made Through Application and Requests for Additional Information
- Tracked with Onsite Commitment Tracking System and Corrective Action Program
- ~ 114 Commitments made to Date

Open Items

- Core Plate Hold-Down Bolts
- Drywell Shell Corrosion
- Inspection of RHRSW Piping

Summary

- Three Unit Application at Current Licensed Thermal Power
- Prepared using Generic Aging Lessons Learned Report (Rev. 0, 2001)
- Appendix F ensures Unit 1 Differences are resolved prior to Restart of the Unit
- Unit 2 and Unit 3 Operating Experience is Applicable to Unit 1