



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

December 2, 2004

MEMORANDUM TO: ACRS Members

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

SUBJECT: CERTIFICATION OF THE MINUTES OF THE ACRS
SUBCOMMITTEE MEETING ON THE JOSEPH M. FARLEY
NUCLEAR POWER PLANT LICENSE RENEWAL APPLICATION,
NOVEMBER 3, 2004 - ROCKVILLE, MARYLAND

The minutes of the subject meeting were certified on November 29, 2004, as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc: J. Larkins
S. Duraiswamy
J. Flack
M. Snodderly



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

November 16, 2004

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

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

SUBJECT: WORKING COPY OF THE MINUTES OF THE ACRS
SUBCOMMITTEE MEETING ON THE JOSEPH M. FARLEY
NUCLEAR POWER PLANT LICENSE RENEWAL APPLICATION,
NOVEMBER 3, 2004 - 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 in the pre-addressed envelope attached.

Attachment: Minutes (DRAFT)

cc w/o Attachment:

J. Larkins
J. Flack
S. Duraiswamy
M. Snodderly



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

FROM: Mario Bonaca, Chairman
ACRS Plant License Renewal Subcommittee

SUBJECT: CERTIFICATION OF THE MINUTES OF THE ACRS
SUBCOMMITTEE MEETING ON THE JOSEPH M. FARLEY
NUCLEAR POWER PLANT LICENSE RENEWAL APPLICATION,
NOVEMBER 3, 2004 - ROCKVILLE, MARYLAND

I hereby certify, to the best of my knowledge and belief, that the minutes of the subject meeting on November 3, 2004, are an accurate record of the proceedings for that meeting.

/RA/ 12/9/04
Mario Bonaca , Date
Plant License Renewal Subcommittee Chairman

CERTIFIED

11/29/04

By Mario Bonaca

Issued: 12/2/04

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MINUTES OF ACRS PLANT LICENSE RENEWAL SUBCOMMITTEE MEETING
ON THE JOSEPH M. FARLEY NUCLEAR POWER PLANT
NOVEMBER 3, 2004
ROCKVILLE, MARYLAND

On November 3, 2004, the Plant License Renewal Subcommittee held a meeting in Room T-2B3, 11545 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to review and discuss the Joseph M. Farley License Renewal Application (LRA) and Draft Safety Evaluation Report (SER).

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. Cayetano Santos was the Designated Federal Official for this meeting. The meeting was convened at 1:30 p.m. and adjourned at 5:30 p.m. on November 3, 2004.

ATTENDEES:

ACRS MEMBERS/STAFF

Mario Bonaca, Chairman

Richard Denning, Member

John Sieber, Member

Cayetano Santos Jr., ACRS Staff

Victor Ransom, Member

William Shack, Member

Graham Wallis, Member

Graham Leitch, Consultant

NRC STAFF/PRESENTERS

P.T. Kuo, NRR

C. Julian, Region II

G. Cranston, NRR

S. Bailey, NRR

S. Lee, NRR

T. Ford, NRR

R. Dipert, NRR

J. Pulsipher, NRR

L. Lois, NRR

T. Steingass, NRR

H. Ashar, NRR

R. Auluck, NRR

A. Stubbs, NRR

L. Lund, NRR

E. Forrest, NRR

Y. Diaz, NRR

G. Galletti, NRR

P Wen, NRR

Tilda Liu,, NRR

P. Chen, NRR

J. Rowley, NRR

J. Strnisha, NRR

T. Le, NRR

J. Tapp, NRR

K. Chang, NRR

M. Lintz, NRR

J. Medoff, NRR

D. Nguyen, NRR

D. Jeng, NRR

R. Subbaratnam, NRR

D. Merzke, NRR

J. Fair, NRR

J. Dixon-Herrity, NRR

J. Golla, NRR

Z. Cruz-Perez, NRR

S. Coffin, NRR

K. Corp, NRR
M. Heath, NRR
K. Hsu, NRR

G. Suber, NRR
J. Terrell, NRR

OTHER ATTENDEES

J. Fridrichsen, SNC
C. Pierce, SNC
M. Crisler, SNC
G. Young, Entergy Nuclear
E. Patel, ISL
K. Sakamoto, JNES
J. Meyer, ISL
S. Faridi, ISL

W. Lunceford, SNC
M. MacFarlane, SNC
P. Ghosal, SNC
S. Tam, ANL
S. Pope, ISL
R. Grimbir, American Electric Power
F. Saba, ISL
H. Abelson, ISL Consultant

The presentation slides and handouts used during the meeting and a complete list of attendees is attached to the Office Copy of the meeting minutes. The presentation to the Subcommittee is summarized below.

Opening Remarks

Mr. Bonaca, Chairman of the Subcommittee on Plant License Renewal convened the meeting and made a few introductory remarks. The purpose of this meeting was to review the Southern Nuclear Operating Company (SNC) application and the related Draft Safety Evaluation Report (SER) for Farley Units 1 and 2. Mr. Bonaca called upon Mr. Kuo of the Office of Nuclear Reactor Regulation (NRR) to begin the discussion.

Staff Introduction

Mr. Kuo introduced Ms. Liu, the Farley license renewal Project Manger, and noted that Farley is the first plant to receive the new audit and review process for consistency with the Generic Aging Lessons Learned Report (GALL). Mr. Kuo stated this new process has been successful based on feedback from industry and requested comments from the Members on the report produced by the audit team.

Farley License Renewal Application

Mr. Pierce, SNC, introduced accompanying members of the SNC staff and called upon Mr. Fridrichsen, SNC, to make his presentation. The key elements of his presentation included a description of the Farley Nuclear Plant (FNP), its operating history, the application of GALL, commitment tracking, and other industry issues.

Background and Plant Description

In a letter dated September 12, 2003, SNC submitted its application to the NRC for renewal of the Joseph M. Farley operating licenses for up to an additional 20 years. The current operating licenses for Farley Units 1 and 2 expire on June 25, 2017, and March 31, 2021, respectively.

FNP consists of two 3-loop Westinghouse pressurized water reactor units with an electrical capacity of 910 MWe per unit. Units 1 and 2 began initial operations in 1977 and 1981, respectively. The containment for each unit consists of a steel lined, prestressed, post-

tensioned concrete structure. FNP has forced draft cooling towers, six offsite power sources, and five emergency diesel generators onsite. The ultimate heat sink is a seismic cooling water pond. FNP operates on 18 month fuel cycles.

Operating History/Major Equipment Replacements and Repairs

Mr. Fridrichsen described FNP's performance from 1999 to 2003 and noted that all of the NRC performance indicators have been green since the first quarter of 2001. In 1983 upflow modifications were made in Unit 1 due to fuel failures caused by baffle jetting. In 1985 hydrogen cracking occurred in the anchor head of a containment tendon in Unit 2. In 1988 the NRC issued a bulletin in response to an event at Farley in which thermal cycling from valve leakage caused a pipe to crack. The Zinc Addition Project was implemented for Unit 2 in 1994 and for Unit 1 in 1999 to reduce the susceptibility to stress corrosion cracking. This project has also led to a reduction in radiation exposure. In 1998 power was uprated by 123 MWt for each unit. The steam generators for both units were replaced in 2000 and 2001. The reactor vessel heads for both units will be replaced in 2004 and 2005. Mr. Fridrichsen stated that SNC is focused on the long term operation of Farley.

Application of GALL

Mr. Fridrichsen stated that SNC maximized the use of the GALL report but some GALL exceptions and plant specific programs were needed. He described the most significant deviations in the Reactor Vessel Surveillance Program, the Reactor Vessel Internals Program, the Non-EQ Cables Used in Instrumentation Circuits Program, and the Water Chemistry Control Program. Minor exceptions to GALL were used for cases in which later versions of codes and standards were used, the program's scope was expanded beyond that described in GALL, or later NRC guidance was used.

Commitment Tracking

Mr. Fridrichsen stated that approximately 130 commitments have been made to date through the license renewal application, requests for additional information (RAIs), and the audit/inspection process. These commitments are tracked with an onsite commitment tracking software.

Industry Issues

Mr. Fridrichsen concluding by stating that inspections have been performed at both Farley units in response to industry events of cracking in bottom mounted instrumentation nozzles and cracking at VC summer. No degradation was evident from these inspections. Inspections of the reactor vessel heads did not reveal any leaking CRDM penetrations.

SER Overview

Ms. Liu discussed the staff's license renewal activities. The key elements of the staff's presentation described an overview of the Draft SER, the aging management program reviews and audits, and the time limited aging analyses.

Ms. Liu stated that Farley was the first plant to use the revised NEI application format and the staff's review of Farley was the first to implement the consistency with GALL audits. This new review process for the aging management programs and aging management reviews reduced the number of RAIs issued compared to previous reviews of other license renewal applications (LRAs). The Draft SER was issued on October 15, 2004, and concluded that the FNP license

renewal application meets the requirements of 10 CFR Part 54. The Draft SER did not contain any open or confirmatory items but did list the following license conditions:

1. The FSAR should be updated following the issuance of the renewed licenses.
2. The commitments listed in Appendix A of the Draft SER should be completed on schedule.
3. The reactor vessel surveillance program should continue to meet the standards of ASTM E185-82 and any changes to the capsule withdrawal schedule should be approved by the NRC.

Scoping and Screening Methodology

Ms. Liu stated that the applicant's scoping methodology meets the requirements of 10 CFR 54.4 and the scoping and screening results include all structures, systems, and components (SSCs) subject to aging management review required by 10 CFR 54.21(a)(1). Ms. Liu noted that the applicant's scoping methodology was revised based on an RAI. Initially, the mechanical scoping criteria for spray interaction in low energy lines assumed an interaction radius of 20 ft and was limited to only electrical SSCs. The scoping criteria for these lines was revised to all fluid-bearing non-safety related SSCs in the same space as the safety-related SSCs and the valid targets were expanded to include mechanical and structural SSCs. As a result of this revised methodology, 8 additional auxiliary systems were brought into scope, 3 of which resulted in revised aging management reviews.

Onsite Inspection Results

Mr. Julian, Region II, described the license renewal inspections performed by the staff. The scoping and screening inspection concluded that the applicant's scoping and screening process successfully identified SSCs that require an aging management review. This inspection did note that the Refueling Water Storage Tank's atmospheric vents were inconsistently identified as in or out of scope in boundary drawings. The applicant subsequently corrected the drawings. The aging management program inspection conducted by the region concluded that the plant was being adequately maintained and that documentation was detailed and comprehensive. Another inspection has been scheduled for March 2005 to verify that future commitments are in the applicant's commitment tracking system. Mr. Julian concluded by stating that all NRC performance indicators for Farley 1 and 2 are green.

Aging Management Program Review and Audits

Ms. Liu and Mr. Chang, NRR, described audits of the Aging Management Programs (AMPs) and Aging Management Reviews (AMRs) performed by the staff and their contractors. These audits compared the AMPs and AMRs in the LRA against the GALL report.

The audit of the aging management programs checked for consistency with GALL including any exceptions or enhancements. Of the 22 AMPs at Farley, 8 were consistent with GALL, 10 were consistent with GALL with deviations (enhancements or exceptions), and 4 were plant specific. Some of the AMPs described included the Fatigue Monitoring Program, the One-Time Inspection Program, the Non-EQ Cables in Instrumentation Circuits Program, the Reactor Vessel Surveillance Program, and the NiCrFe Component Assessment Program.

The Fatigue Monitoring Program is a new AMP consistent with GALL used to monitor fatigue of metal components in the reactor coolant pressure boundary. Currently FNP is using a manual cycle counting method but plans to use fatigue monitoring software in the future. This software

will also be capable of conducting stress based on-line fatigue monitoring for the surgeline and the lower region of the pressurizer. Mr. Chang also noted that Farley Unit 2 experienced a leak in a pipe connected to the Loop B cold leg.

The One-Time Inspection Program is a new, plant-specific AMP used to (1) verify an aging affect is not occurring, or (2) verify aging is progressing very slowly, or (3) validate the effectiveness of other AMPs. The components included in this program will be sampled from a population that could include the pressurizer CASS spray heads, RCS small bore butt-welded piping, or RCP thermal barrier CCW nozzles.

The Non-EQ Cables Program is a new AMP used to maintain the function of electrical cables not subject to EQ requirements but are exposed to heat, radiation or moisture. This AMP is consistent with GALL with the exception that cables with high voltage, low level signals will be tested in accordance with the alternate XI.E.2 program developed by the License Renewal Electrical Working Group. In order to make this AMP consistent with GALL, the applicant committed to testing all such cables.

The Reactor Vessel Surveillance Program is an existing AMP used to predict fracture toughness changes in the reactor pressure vessel. This program is consistent with GALL with one exception. The applicant plans to remove all of the surveillance capsules prior to entering the period of extended operation but has committed to install alternate dosimetry in each unit to monitor neutron fluence. One of the recommended license conditions for license renewal is for Farley to continue to meet the ASTM E 185-82 standard and submit for NRC approval any changes to the capsule withdrawal schedule.

The NiCrFe Component Assessment program is a new, plant-specific AMP used to monitor nickel alloys for primary water stress corrosion cracking. As part of this AMP, the applicant has committed to continue participating in industry initiatives, implement inspections consistent with EPRI-MRP recommendations and submit an inspection plan for NRC approval 24-36 months prior to entering the period of extended operation

The other AMPs described by the staff were the Water Chemistry Control Program, the Flow Accelerated Corrosion Program, and the Fire Protection System Program.

The staff concluded that aging effects associated with the reactor systems; engineered safety features systems; auxiliary systems; steam and power conversion systems; containments, structures, and component supports; and electrical components would be adequately managed by appropriate AMPs during the period of extended operation. The staff also noted that the below-grade environment is non-aggressive based on the pH, chloride, and sulfate levels.

The LRA stated that no program was needed to manage the loss of fracture toughness due to thermal aging of CASS piping because updated leak-before-break (LBB) analyses showed that adequate toughness remains during the period of extended operation. The GALL report recommends that either enhanced volumetric examination or a flaw tolerance evaluation be performed to manage this aging mechanism. The applicant committed to revising the LRA to be consistent with the GALL report.

In March 2004, the staff approved Farley's RI-ISI program to select small-bore Class 1 butt weld locations for one-time volumetric examinations. However, RI-ISI was not to be used to eliminate locations from the scope of these one time examinations. At the staff's request, the

applicant identified a 2" drain line connected to the nominal letdown line in each unit that will be volumetrically examined under RI-ISI.

Time Limited Aging Analyses (TLAAs)

Ms. Liu stated that the time limited aging analyses in the LRA meets the requirements of 10 CFR Part 54. She described the TLAAs associated with embrittlement of the reactor pressure vessel, metal fatigue, ultimate heat sink silting, and leak-before-break.

The staff's review of the neutron embrittlement on the reactor vessel TLAAs concluded that (1) the applicants calculation of neutron fluence projected through the period of extended operation conforms with RG 1.190 (2) the beltline materials will continue to meet the upper shelf energy requirements of 10 CFR 50 Appendix G for the period of extended operation (3) the beltline materials will continue to meet the PTS requirements in 10 CFR 50.61 for the period of extended operation (4) the calculation of the 1/4T and 3/4T adjusted reference temperatures conform to RG 1.99 Revision 2 and (5) the pressure-temperature limits for the period of extended operation are based on an NRC-approved Pressure Temperature Limit Report process.

The staff's review of the metal fatigue TLAAs found (1) that the charging nozzle and the RHR/SI nozzle to the RCS cold leg may exceed a fatigue cumulative usage factor of 1.0 so the applicant committed to take corrective action before the period of extended operation, (2) the RCP flywheels contain a sufficient margin against fracture for the period of extended operation, (3) the fatigue analyses of piping systems constructed of ASME Non-Class 1 components will remain valid for the period of extended operation, and (4) the containment tendon pre-stress forces projected for 60 years of operation are above the minimum required value.

The ultimate heat sink for Farley is a service water pond. The staff performed an independent analysis and examined surveillance data to verify that the water pond volume will remain above the 1325 acre-feet value used in the FSAR.

The applicant revised the LBB analysis to include the impact of aging degradation mechanisms through the period of extended operation. The staff concluded that this analysis was acceptable.

The applicant took credit for RHR relief valves during a cold overpressure event by calculating relief valve capacity given the safe operating pressure-temperature limit curves. The applicant has committed to update this analysis for the 54 EFPY pressure-temperature limit curves before entering the period of extended operation.

Ms. Liu concluded by stating that the Farley LRA meets the requirements of 10 CFR Part 54.

Member Comments

The Subcommittee thought that both the license renewal application and draft SER were complete, well-organized, and of high quality. The Subcommittee thought that the audit report of the AMPs and AMRs was repetitive and contained a lot of information in the SER, but was well-organized and provided many useful insights to a reviewer.

Chairman Bonaca commented that he was encouraged by an observation from an inspector that the plant looks better than it did 6-8 years ago. Chairman Bonaca asked about Farley's operating experience regarding a bulge found in containment lining, failures in mainsteam line support hangers, and leaks in underground piping. SNC staff responded that the bulge in the containment lining was due to construction and has no effect on functionality, the hangers are covered by the inservice inspection program, and Farley's experience with underground piping leaks is similar to other plants.

Several Members questioned the high usage factors and cycles associated with the metal fatigue TLAA. The staff responded that these values are conservative and bounding values. The usage factors are large because of environmental effects and a more realistic analysis would show greatly reduced stresses and usage factors less than 1.

Member Wallis asked several questions clarifying the staff's analysis of the minimum containment tendon pre-stress and the ultimate heat sink silting.

Consultant Leitch and Chairman Bonaca asked several questions regarding the justification for components being placed in or out of scope for license renewal.

Several Members asked clarification questions regarding the Fuel Oil Chemistry Control Program, the Flow Accelerated Corrosion Program, and the External Surface Monitoring Program.

Member Shack asked what is the CDF for the plant.

Staff Commitments

The staff committed to provide the CDF for Farley before the full Committee review of the final SER.

Subcommittee Decisions and Follow-up Actions

The Subcommittee will summarize the discussions to the full Committee during November 2004 ACRS meeting.

Background Materials Provided to the Committee

1. License Renewal Application for Joseph M. Farley Nuclear Plant Units 1 and 2, dated September 2003
2. NRC Inspection Report 50-348/2004-007, 50-364/2004-007, J.M. Farley Nuclear Plant, License Renewal Inspection Program, Scoping and Screening, June 22, 2004
3. Information Systems Laboratories, Inc. Audit and Review Report for Plant Aging Management Reviews and Programs, Joseph M. Farley Nuclear Plant, Units 1 & 2,
4. Draft Safety Evaluation Report Related to the License Renewal of the Joseph M. Farley Nuclear Plant, Units 1 and 2, dated October 2004

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).
