October 9, 2001

MEMORANDUM TO: ACRS Members

FROM: Noel Dudley, Senior Staff Engineer
ACRS

SUBJECT: CERTIFICATION OF THE SUMMARY/MINUTES OF THE ACRS SUBCOMMITTEE MEETING ON THE SAFETY EVALUATION REPORT RELATED TO THE LICENSE RENEWAL APPLICATION FOR TURKEY POINT, UNITS 3 AND 4, SEPTEMBER 25, 2001 ROCKVILLE, MARYLAND

The minutes of the subject meeting, issued on October 2, 2001, have been certified as the official record of the proceedings of that meeting. A copy of the certified minutes is attached.

Attachment: As stated

cc via e-mail:
J. Larkins
S. Bahadur
ACRS Fellows and Technical Staff

cc: ACRS Secretary
E. Barnard (3 copies)

Issued: 10/2/01
Certified: 10/4/01

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
MINUTES OF ACRS SUBCOMMITTEE MEETING ON
PLANT LICENSE RENEWAL
TURKEY POINT UNITS 3 AND 4
SEPTEMBER 25, 2001
ROCKVILLE, MARYLAND

The ACRS Subcommittee on Plant License Renewal held a meeting on September 25, 2001, at 11545 Rockville Pike, Rockville, Maryland, in Room T-2B3. The purpose of the meeting was to hold discussions with representatives of the NRC staff and Florida Power and Light, Company, (FPL) concerning the open and confirmatory items identified in the safety evaluation report (SER) related to the license renewal of Turkey Point, Units 3 and 4, and associated Westinghouse topical reports. Mr. Noel Dudley was the cognizant ACRS staff engineer for this meeting. The meeting was convened at 8:30 a.m. on September 25, 2001, and adjourned at 4:20 p.m. on the same day.

ATTENDEES:

ACRS
M. Bonaca, Chairman
P. Ford, Member
S. Rosen, Member
W. Shack, Member
N. Dudley, ACRS Staff

NRC STAFF
R. Auluck, NRR
S. Hoffman, NRR
B. Elliot, NRR
J. Davis, NRR
C. Munson, NRR
A. Keim, NRR
M. Khanna, NRR
G. Galletti, NRR
M. Khanna, NRR
B. Thomas, NRR
P. Shemanski, NRR
A. Lee, NRR

ENTERGY OPERATIONS, INC.
E. Thompson, FPL
S. Hale, FPL

There were no written comments or requests for time to make oral statements received from members of the public. Approximately 10 members of the public attended the meeting. A list of meeting attendees is available in the ACRS office files.

ACRS SUBCOMMITTEE CHAIRMAN'S INTRODUCTION

Dr. Mario Bonaca, Chairman of the Plant License Renewal Subcommittee, convened the meeting and stated that the purpose of the meeting was to discuss the staff's SER, with open items, related to the license renewal Turkey Point Plant, Units 3 and 4, and the associated Westinghouse topical reports. Dr. Bonaca noted that during the presentation, he would raise issues provided by Mr. John Barton, an ACRS consultant. He called upon Ms. Elizabeth Thompson, FPL, to begin.

FPL PRESENTATION Ms. Elizabeth Thompson and Mr. Stephen Hale, FPL

Ms. Thompson, presented background information concerning the preparation of the license renewal application for Turkey Point Units 3 and 4. Mr. Stephen Hale, FPL, presented the purpose and criteria of the scoping and screening processes. He explained the scoping process for safety-related structures and components and for non-safety related structures and components that could affect safety-related equipment. Mr. Hale described the screening process for mechanical systems, structures, and electrical and instrumentation and control systems.

Mr. Hale presented the purpose of the aging management reviews. He explained how the aging effects, which require aging management programs, were established based on technical resources, operating experience reviews, and peer reviews. He summarized the requirements for common aging management programs. Mr. Hale described the time limited aging analyses (TLAA) process and listed the seven TLAAs for Turkey Point. He concluded that:

- The aging management programs at Turkey Point will adequately manage aging effects so that the intended functions of in-scope systems, structures, and components (SSCs) will be maintained consistent with the current licensing basis for the period of extended operations.

- All TLAAs for Turkey Point were identified, evaluated, and shown to be acceptable for the extended period of operation.

Dr. Shack asked why the staff had to issue a request for additional information concerning the fatigue of the pressurizer surge line given that the same issue had been adequately addressed during the staff review of the license renewal application for Arkansas nuclear One, Unit 1. Mr. Hale explained that Turkey Point is the first plant to apply for license renewal that was constructed in accordance with B-31.1 design criteria and, as such, new questions were identified regarding the design of the pressurizer. In addition, the safety evaluation of the Westinghouse topical report WCAP–14574-A, “License Renewal Evaluation: Aging Management Evaluation for Pressurizes,” identified new areas of concerns that the applicant addressed.

Dr. Bonaca questioned how the application would have been modified if the generic guidance documents had been available. Mr. Hale explained that referencing the Generic Aging Lessons Learned (GALL) report would have been beneficial.

Mr. Rosen asked why it was necessary to consider non-safety SSCs in the scoping and screening process. Mr. Hale stated that since Turkey Point was one of the early plants which was licensed, not all systems now considered to be safety-related were identified as safety-related.

In response to a question prepared by Mr. Barton, Mr. Hale explained why the following SSCs were not included in scope:

- Hot containment penetrations lines are outside plant structures and will not exceed 150°F if a line break occurs.

- The consequences of a release from the ventilation system of the Radiological Waste Building is less than 10 CFR Part 100 limits.

- The screen wash system is not necessary to maintain suction during a severe accident, since the circulating water pumps are secured.

- The C-bus only provides power to non-safety loads.

- The off-site transformers are not necessary during severe accidents since the safety-related diesel generators provide power.

Mr. Bonaca questioned why the spent fuel pool cooling system was within scope for Turkey Point when all previous applicants considered spent fuel pool cooling systems to be outside the scope of license renewal. Mr. Stephen Hoffman explained that scoping of SSCs was dependent of the current design basis for each plant.

The Subcommittee members and FPL representatives discussed the aging management program for the fatigue of thin wall stainless steel piping located in trenches outside the turbine building. Mr. Hale explained that the aging management program for these pipes was derived from operational experience of similar pipes at St. Lucie.

Dr. Ford questioned how licensees predict the failure of component, such as baffle bolts, and how they calculated the risk associated with these failures. Mr. Hale explained that the industry uses operating experience and the results of inservice inspections and inservice tests to move toward risk-informed inspection programs. He noted that aging management programs rely on defense-in-depth designs, operating experience, redundancy, and early defect detection to control risk.

Dr. Bonaca asked why ASME Class II pipes were not within the scope of license renewal when they were physically located over Class I pipes. Mr. Hale explained that failures of ASME Class II pipes were not part of the current design accident analyses and that non-safety related systems which affect safety related components are already considered within scope (i.e. piping supports).

NRC SAFETY EVALUATION REPORT (SER) PRESENTATION

Introduction: Mr. Rajender Auluck, NRR

Mr. Rajender Auluck outlined the staff's presentation and introduced the presenters. He provided an overview of the license review schedule and the SER format. Mr. Auluck summarized the open items and the staff's inspection activities. During discussions with the Subcommittee members, Mr. Auluck provided the following information.

- In response to the emerging issue of reactor vessel head penetration cracking, the applicant committed to adopt future industry recommendations.

- Emerging issues, which are identified after the operating license is renewed, will be

handled by using the existing site-specific corrective action program.

- Babcock and Wilcox manufactured the Turkey Point reactor vessel to Westinghouse specifications.

- The Turkey Point fatigue monitoring program verifies commutative usage factors are not exceeded.

- The Turkey Point license renewal application contained most of the required information, however, the staff needed assistance in located specific information.

Chap. 2.0 - Structures and Components Subject to an Aging Management Review: Messrs. Greg Galletti and Brian Thomas, NRR

The staff described its methodology for reviewing the applicant's scoping and screening process, its on-site audits, and its findings and conclusions.

Mr. Rosen questioned the use of the emergency operating procedures (EOPs) in the scoping and screening processes. Mr. Galletti explained that the results of the processes were compared to the maintenance program results, which were derived in part, by using the EOPs.

Mr. Rosen noted that the staff did not evaluate the qualification and training of licensee personnel on the commitments made in the license renewal application. Ms. Thompson, FPL, stated that the new information in the application was automatically included in the training programs for licensee engineers.

Chap. 3.1 - Common Aging Management Programs: Ms. Meena Khanna, NRR

Ms. Meena Khanna, NRR, identified the common aging management programs the staff reviewed.

Chap. 3.2 - Reactor Coolant System: Ms. Meena Khanna, NRR

Ms. Khanna identified the systems reviewed by the staff. She noted that the applicant did not reference the Westinghouse topical reports in the application, but did compare the topical report results to the commitments in the application. She stated that the reactor vessel head penetration nozzle cracking will be managed by the reactor vessel head alloy 600 penetration inspection program.

Dr. Bonaca questioned whether all Westinghouse topical report action items were addressed in the application. Mr. Hale, FPL, explained that the action items not addressed in the application were addressed in subsequent responses to staff Requests for Additional Information.

Dr. Ford asked if the reactor vessel internals aging management program had been reviewed against the ASME code. Mr. Allen Hiser, Jr., NRR, explained that the inspection programs were still being developed and that the staff was monitoring the industry's progress.

Dr. Ford asked when data would become available to better predict component failures. The staff explained that inspections were ongoing at established intervals and that if research results

indicated problems, then the inspection intervals would be shortened. Dr. Ford stated that not enough data presently exists and that 10 year is too long to wait. He suggested that calculated changes in the loss of coolant accident frequency should be used to determine the priority of research needs.

In response to questions from Dr. Bonaca the staff and Mr. Hale explained that:

- the containment radiation monitors were within the scope of license renewal, however, no aging effects had been identified and no aging management programs were necessary; and

- the main steam insolation valve air accumulators are within scope and have an aging management program, however, the backup instrument air bottles, which are routinely replaced, are not within scope and do not have an aging management program.

Chap. 3.3 - Engineered Safety Features: Ms. Meena Khanna, NRR

Ms. Khanna identified the systems reviewed by the staff. She noted that the applicant adequately identified the aging effects and applicable aging management programs for each component of the engineered safety features system.

Chap. 3.4 - Auxiliary Systems: Mr. James Davis, NRR

Mr. James Davis, NRR, identified the systems reviewed by the staff. The Subcommittee members and the staff discussed inspections requirements for inaccessible areas and operating experience at other plants. The staff agreed to provide the Subcommittee an explanation for why the intake structure does not have an aging management program.

Chap. 3.5 - Steam and Power Conversion Systems: Mr. James Davis, NRR

Mr. Davis identified the systems reviewed by the staff.

Chap. 3.6 - Structures and Components: Mr. Clifford Munson, NRR

Mr. Clifford Munson, NRR, identified the structural components and commodities reviewed by the staff.

Chap. 3.7 - Electrical Components: Mr. Paul Shemanski, NRR

Mr. Paul Shemanski, NRR, identified the electrical component types subject to aging management review. He noted that no aging management program was required for non-environmentally qualified (EQ) medium voltage cables subject to moisture, since the cables were designed with a lead sheath to prevent failure from water treeing due to moisture ingress. He stated that on the basis of the staff's review, the applicant developed a new aging management program for non-EQ cables, connections, and electrical penetrations. The Subcommittee and Mr. Shemanski discussed the operating experience and testing of the lead sheath cables.

Chap. 3.8 - New Aging Management Programs: Ms. Andrea Keim, NRR

Ms. Andrea Keim, NRR, identified the aging management programs that were developed to support the license renewal application. Dr. Shack questioned the meaningfulness of the one-time inspection of small bore piping. Mr. Barry Elliot, NRR, explained that cracking in small bore piping has not been a problem and that the one-time inspection is intended to confirm the absence of cracking.

Dr. Shack stated that the applicant's proposal to use a VT-1 visual inspection of baffle bolts was insufficient, in and of itself, but would be acceptable if performed in conjunction with an ultrasonic test. He stated that one-time inspections of reactor vessel internals using a VT-1 visual inspection as implied by the SER, is not sufficient. The staff agreed to review and modify the SER to clarify this issue.

Field erected tanks internal inspection: Mr. Clifford Munson, NRR, explained the open item concerning one-time inspection of condensate storage tanks, demineralized water storage tanks, and the refueling water storage tank.

Galvanic corrosion susceptibility inspection program: Mr. James Davis, NRR, identified the specific component and commodity groups for which credit was taken for this aging management program. He described the use of baseline examinations and one-time inspections.

Chap. 3.9 - Existing Aging Management Review: Ms. Andrea Keim, NRR

Ms. Keim identified the existing aging management programs reviewed by the staff. Dr. Ford stated that the staff should take a leadership role in resolving emerging aging degradation issues. Mr. Elliot explained that licensees are responsible for identifying emergent issues and determining appropriate resolution, where as the staff is responsible for confirming the adequacy of the proposed resolutions.

Chap. 4.0 - Time-Limited Aging Analyses: Messrs. Barry Elliot and Paul Shemanski, NRR

Mr. Barry Elliot, NRR, identified the time-limited aging analyses (TLAAs) reviewed by the staff.

Reactor vessel irradiation embrittlement: Mr. Elliot noted that the applicant must apply the chemistry factor ratio adjustment to the surveillance data when submitting the 48 EFPY pressure-temperature curves for staff approval. He observed that the circumferential weld between the nozzle belt and the intermediate shell approaches RT_{PTS} screening criterion at end of life and should be tracked and considered by the licensee in future submittals.

The Subcommittee and the staff discussed the appropriateness of allowing licensees to continue operating reactor pressure vessels that are within a few degrees of the pressurized thermal shock screening criterion. The staff explained that the screening criterion is very conservative and that if the criterion is exceeded licensees are required to perform plant-specific evaluations.

Metal fatigue: Mr. Elliot identified an open item that requires the staff to complete a review of the Westinghouse topical report regarding the evaluation of underclad cracking.

Environmental review process: Mr. Shemanski noted the staff disagreed with the applicant as to which requirement in 10 CFR 54.21, "Contents of application - Technical information," is being met, but accepts the application on the basis of the technical adequacy of the equipment qualification. The applicant committed to revise the EQ documentation package to referenced the wear cycle aging effect on Westinghouse and Joy motors.

WESTINGHOUSE TOPICAL REPORTS Mr. Barry Elliot, NRR

Mr. Elliot presented the materials used, the aging effects, aging management programs, TLAAs, renewal application action items, and significant technical issues for the following Westinghouse Topical Reports:

- Westinghouse Energy Systems WCAP-14422 Rev. 2-A, "Licensing Renewal Evaluation: Aging Management for Reactor Coolant Systems Supports."
- Westinghouse Energy Systems WCAP-14574-A, "License Renewal Evaluation: Aging Management Evaluation for Pressurizers."
- Westinghouse Energy Systems WCAP-14575-A, "Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components."
- Westinghouse Energy Systems WCAP-14577 Rev. 1-A, "License Renewal Evaluation: Aging Management for Reactor Internals."

Mr. Elliot concluded that upon completion of all renewal application action items, applicants who reference the topical reports will have adequately demonstrated that the aging of components within the scope of the topical reports can be managed adequately for the period of extended operations.

Dr. Ford stated that the reports do not provide data concerning the effects on safety margins and questioned how a reviewer would be able to make a decision on the adequacy of the aging management programs. The Subcommittee recognized that this information relates to the current licensing basis and not to the license renewal process.

Dr. Bonaca stated that in order to make a clear distinction between the current licensing basis and license renewal commitments, the SERs should include a description of the philosophy and implementation of the license renewal process.

SUBCOMMITTEE COMMENTS, CONCERNS, AND RECOMMENDATIONS

Mr. Rosen requested additional information concerning allowing continued plant operations when the calculated reference temperature of the reactor pressure vessel (RT_{PTS}) is within a few degrees of the pressurized thermal shock screening criterion.

Mr. Rosen stated that in order to retain corporate knowledge, licensees should be required to provide training on license renewal commitments to their employees.

Mr. Rosen stated that there should be clarity as to how EOPs should be used in the license renewal screening process.

Dr. Ford stated the license renewal application identified aging management programs. However, Dr. Ford expressed his view that the topical reports did not contain sufficient data for reviewers to reach well supported decisions. The topical reports rely on programs that are part of the current licensing basis.

Drs. Shack and Bonaca stated that the table format used in the application was good and easy to follow. Dr. Shack noted that the application on the CD Rom was easy to use, however, the hard copy of the application was difficult to navigate.

Dr. Bonaca agreed with the staff's position concerning the evaluation of seismic ASME Class II pipes located over Class I components

The Subcommittee agreed that the Westinghouse topical reports would be useful for future applicants.

STAFF AND INDUSTRY COMMITMENTS

The staff committed to provide the ACRS with a reference for an explanation of the applicants scoping methodology. [Provided 9/25/01; Application for Renewed Operating License for Turkey Point Units 3 & 4, pages 2.1-4 to 2.1-12]

The staff agreed to consider clarifying its approval for use of the VT-1 inspection for reactor vessel internals including baffle bolts.

The staff committed to provide the ACRS a copy of the Request for Additional Information regarding the integrity of the reactor pressure vessel. [Provided 9/25/01]

SUBCOMMITTEE DECISIONS

The Subcommittee decided not to prepare an interim letter nor a letter concerning the Westinghouse Topical Reports.

The Subcommittee requested that the staff present an abbreviate version of its presentation regarding the SER and Westinghouse Topical Reports to the ACRS on October 5, 2001.

FOLLOW-UP ACTIONS

The Subcommittee plans to visit Turkey Point Units 3 and 4, after the resolution of the remaining open items are documented in the SER.

PRESENTATION SLIDES AND HANDOUTS PROVIDED DURING THE MEETING

The presentation slides and handouts used during the meeting are available in the ACRS office files or as attachments to the transcript.

BACKGROUND MATERIAL PROVIDED TO THE SUBCOMMITTEE:

1. U.S. Nuclear Regulatory Safety Evaluation Report with Open Items Related to the License Renewal of Turkey Point Nuclear Plant, Units 3 and 4, issued August 2001.
2. Selected Sections from the Florida Power and Light, Company's Application for Renewed Operating Licenses, Turkey Point Units 3 & 4, based on individual Members' review assignments.
3. Westinghouse Energy Systems WCAP-14422 Rev. 2-A, "Licensing Renewal Evaluation: Aging Management for Reactor Coolant Systems Supports," issues December 2000.
4. Westinghouse Energy Systems WCAP-14574-A, "License Renewal Evaluation: Aging Management Evaluation for Pressurizers," issued December 2000.
5. Westinghouse Energy Systems WCAP-14575-A, "Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components," issued December 2000.
6. Westinghouse Energy Systems WCAP-14577 Rev. 1-A, "License Renewal Evaluation: Aging Management for Reactor Internals," issued March 2001.

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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 viewing on the Internet at "http://www.nrc.gov/ACRSACNW," or can be purchased from Neal R. Gross and Co., 1323 Rhode Island Avenue, NW, Washington, D.C. 20005, (202) 234-4433 (Voice), 387-7330 (Fax), e-mail: nrgross@nealgross.com.

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