



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

ACRSR-2122

April 14, 2005

The Honorable Nils J. Diaz
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 2005-0001

SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE LICENSE RENEWAL
APPLICATION FOR THE JOSEPH M. FARLEY NUCLEAR PLANT,
UNITS 1 AND 2

Dear Chairman Diaz:

During the 521st meeting of the Advisory Committee on Reactor Safeguards (ACRS), April 7-8, 2005, we completed our review of the license renewal application for the Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2, and the related final Safety Evaluation Report (SER) prepared by the NRC staff. Our Plant License Renewal Subcommittee also reviewed this matter during a meeting on November 3, 2004. During our review, we had the benefit of discussions with representatives of the NRC staff and Southern Nuclear Operating Company, Inc. (SNC). We also had the benefit of the documents referenced. This report fulfills the requirement of 10 CFR 54.25 that the ACRS review and report on all license renewal applications.

CONCLUSIONS AND RECOMMENDATIONS

1. The programs established and committed to by the applicant will provide reasonable assurance that FNP Units 1 and 2 can be operated in accordance with their current licensing basis for the period of extended operation without undue risk to the health and safety of the public.
2. The SNC application for renewal of the operating licenses for FNP Units 1 and 2 should be approved.

BACKGROUND AND DISCUSSION

FNP Units 1 and 2 are 2775 MW_{th}, three-loop Westinghouse pressurized water reactors housed in pre-stressed/post-tensioned dry containment buildings. SNC requested renewal of the units' operating licenses for 20 years beyond the current license terms, which expire on June 25, 2017, for Unit 1, and March 31, 2021, for Unit 2.

In the final SER, the staff documents its review of the license renewal application and other information submitted by SNC and obtained during the audits and inspections conducted at the plant site. The SER also includes commitments identified by the staff and agreed to by the applicant. The staff reviewed the completeness of the applicant's identification of structures, systems, and components (SSCs) that are within the scope of license renewal; the integrated

plant assessment process; the applicant's identification of the plausible aging mechanisms associated with passive, long-lived components; the adequacy of the applicant's aging management programs; and the identification and assessment of time-limited aging analyses (TLAAs) requiring review.

The FNP application either demonstrates consistency with the Generic Aging Lessons Learned (GALL) Report, or documents deviations to the specified approaches in the GALL Report. The FNP application is the first to be evaluated using a new audit and review process intended to confirm consistency with the GALL Report, and the acceptability of deviations from that report. This approach, which requires more review activities at the site, has resulted in improved communications and more effective interactions between the applicant and the staff, and a significant reduction in requests for additional information. During our meeting, the staff presented a well-structured and effective overview of its reviews, audits, and inspections.

Several scoping issues that in previous applications resulted in significant disagreement between the staff and applicants were promptly resolved at FNP due to the clear interim staff guidance. Among these issues were fuse holders, equipment required to recover from station blackout, and fire protection equipment. The staff disagreed with SNC in some areas, such as the scoping criteria for spray interactions in low-energy lines. We agree with the resolution of these issues, and the staff and SNC should be commended for promptly resolving them.

The applicant performed a comprehensive aging management review of all SSCs within the scope of license renewal. In the application, SNC describes 22 aging management programs for license renewal including existing, enhanced, and new programs. We agree that these programs are adequate.

We reviewed plant-specific operating experience to assess how effectively the applicant has dealt with age-related degradation. In 1987, FNP Unit 2 experienced a throughwall leak in an unisolable portion of the emergency core cooling system piping. The leak was attributed to thermal cycling due to valve leakage. This event led to the issuance of NRC Bulletin 88-08, "Thermal Stresses in Piping Connected to the Reactor Coolant System." Since then, FNP has established accurate baseline cycle counts. For license renewal, the applicant developed a new fatigue monitoring program consistent with the GALL Report for monitoring fatigue of metal piping in components of the reactor coolant pressure boundary. The program will automatically monitor cycles using installed plant equipment.

As in previous reviews, we questioned the adequacy of opportunistic inspections of inaccessible buried piping and tanks, in lieu of periodic inspections at a plant-specific frequency, as specified in the GALL Report. The applicant has committed to enhancing its Buried Piping and Tank Inspection Program by performing an inspection within 10 years of entering the period of extended operation unless an opportunistic inspection has occurred within this 10-year period. This program enhancement is appropriate. The staff has also included this 10-year inspection as new generic guidance in the proposed revision to the GALL Report.

The applicant has also committed to perform an engineering evaluation before the 10th year of extended operation to determine whether sufficient inspections have been conducted to draw a conclusion regarding the ability of the coatings to protect underground piping and tanks from degradation. If not, a focused inspection will be conducted to allow a conclusion to be reached.

We agree with the staff that the applicant has identified and properly addressed systems and components requiring TLAAAs. The staff has independently verified the applicant's calculations of reactor vessel upper shelf energy and has confirmed that the limiting beltline materials at 60 years satisfy the acceptance criteria. We also note that the most limiting beltline materials satisfy the pressurized thermal shock criterion with ample margin based on both the applicant's and the staff's calculations.

When environmental factors are applied and projected to 60 years, cumulative usage factors (CUFs) for some piping locations may exceed a CUF of 1.0. For these locations, the applicant has committed to take corrective action prior to the period of extended operation. This action might include a more refined analysis, repair, replacement, and/or an inspection program approved by the NRC. We are satisfied with this commitment.

The licensee is improving FNP Units 1 and 2. New steam generators with Alloy 690 tubing, quatrefoil support plates, and full depth rolls were installed in both units in 2000 and 2001. Although control rod drive mechanism (CRDM) inspections have not identified leaks, both units are susceptible to CRDM cracking due to high head temperatures. Therefore, reactor vessel heads are being replaced with new heads that contain Alloy 690 penetrations without thermal sleeves. The licensee has also replaced the cooling towers and installed a dry cask storage facility.

Recent inspections of the reactor pressure vessel lower head penetrations of both units revealed no degradation. Bare metal visual inspections of Alloy 600/182/82 pressure boundary locations were also performed and did not reveal any degradation.

We agree with the staff that there are no issues related to the matters described in 10 CFR 54.29(a)(1) and (a)(2) that preclude renewal of the operating licenses for Farley Units 1 and 2. The programs established and committed to by SNC provide reasonable assurance that the plant can be operated in accordance with its current licensing basis for the period of extended operation without undue risk to the health and safety of the public. The SNC application for renewal of the operating licenses for FNP Units 1 and 2 should be approved.

Sincerely,

/RA/

Graham B. Wallis
Chairman

References

3. U.S. Nuclear Regulatory Commission, "Safety Evaluation Report Related to the License Renewal of the Joseph M. Farley Nuclear Plant, Units 1 and 2," March 2005
4. Southern Nuclear Operating Company, Inc. "Joseph M. Farley Nuclear Plant License Renewal Application," September 2003
5. U.S. Nuclear Regulatory Commission, "Draft Safety Evaluation Report Related to the License Renewal of the Joseph M. Farley Nuclear Plant, Units 1 and 2," October 2004
6. U.S. Nuclear Regulatory Commission Inspection Report 50-348/2004-007, 50-364/2004-007, Scoping and Screening, June 22, 2004
7. Information Systems Laboratories, Inc., "Audit and Review Report for Plant Aging Management Reviews and Programs, Joseph M. Farley Nuclear Plant, Units 1 & 2," September 10, 2004