



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

DRAFT SAFETY EVALUATION REPORT

NINE MILE POINT, UNIT 2

DOCKET NO. 50-410

5.3.1 Reactor Vessel Material

Compliance With Appendix H, 10 CFR 50

In a previous SER input, the staff indicated that the applicant's surveillance program had complied with all the requirements of Appendix H, 10 CFR 50 except that the surveillance capsules have been positioned inside the vessel at locations that result in low lead (lag) factors. As a result of these lag factors, the NMP-2 surveillance capsules will provide dosimetry data, but not meaningful material surveillance data throughout the life of NMP-2.

To provide additional material surveillance data, the applicant in letters dated December 3, 1984 and December 17, 1985, has committed to monitor the effect of neutron irradiation on its beltline materials using the surveillance data from its capsules and those in LaSalle Units 1 and 2 (LaSalle) and Washington Public Power Supply Nuclear Plant No. 2 (WNP-2). To ensure that the applicant's surveillance program will adequately monitor neutron irradiation damage it must conform to the integrated surveillance program criteria of Section II.C of Appendix H, 10 CFR 50. The criteria are:

1. There must be substantial advantages to be gained, such as reduced power outages or reduced personnel exposure to radiation.
2. The design and operating features of the reactors in the set must be sufficiently similar to permit accurate comparisons of the predicted amount of radiation damage as a function of total power output.
3. There must be an adequate dosimetry program for each reactor.
4. There must be a contingency plan to assure that the surveillance program for each reactor will not be jeopardized by operation at reduced power level or by an extended outage of another reactor from which data are expected.
5. No reduction in the requirements for number of materials to be irradiated, specimen type, or number of specimens per reactor is permitted.
6. There must be adequate arrangement for data sharing between plants.

In letters dated May 16, 1985, September 30, 1985, and November 18, 1985, the applicant provided information to demonstrate that their surveillance program satisfies the criteria in Section II.C of Appendix H, 10 CFR 50. A summary of these submittals follows.

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The alternative to an integrated surveillance program is that the capsules in the NMP-2 vessel be moved to other locations in the NMP-2 vessel with higher lead factors. Capsules at locations with higher lead factors would provide meaningful material surveillance data. However, the applicant indicates that the NMP-2 surveillance capsules have been located in positions that are advantageous for withdrawal and thus reduce occupational radiation to the technicians removing the capsules. Thus, the advantage gained by the integrated surveillance program is that the capsules would not be moved to locations which could increase personnel exposure to radiation thereby satisfying criterion 1.

The NMP-2, WNP-2, and LaSalle reactors are all BWR-5 251 series vessels and have predicted end-of-life neutron fluence ( $E > 1\text{MeV}$ ) at the 1/4T position of  $1 \times 10^{18} \text{ n/cm}^2$ . The reactor power (3323 MWT), the number of fuel bundles (764) and the vessel diameter (251 inches) are all identical. In addition, the materials placed into the WNP-2 and LaSalle capsules are similar to those in the NMP-2 vessel. Since the vessel and reactor designs of NMP-2, WNP-2 and LaSalle are equivalent and the materials in the WNP-2 and LaSalle capsules are similar to those in the NMP-2 vessel, the test results from the WNP-2 and LaSalle surveillance capsules will permit a determination of the amount of radiation damage to the NMP-2 vessel as a function of its power output.

Each capsule in NMP-2, WNP-2, and LaSalle have sufficient dosimetry and Charpy V-notch specimens to monitor neutron irradiation and damage to the vessel materials. Hence, the dosimetry and Charpy V-notch specimens placed in each capsule satisfy criteria number 3 and 5, above.

Since NMP-2 can utilize data from capsules in three other vessels, WNP-2, LaSalle 1 and 2, the surveillance program will not be jeopardized by operation at reduced power level or extended outage of another reactor from which data are expected. Therefore, criterion 4 is satisfied.

By a letter dated January 16, 1986, the applicant indicated that the Washington Public Power Supply System (WNP-2) and Commonwealth Edison (LaSalle Units 1 and 2) have agreed to participate in the reactor vessel material surveillance program as described in the applicant's letters of September 30, 1985, November 18, 1985, and December 17, 1985. Therefore, criterion 6 is satisfied. In addition, the WNP-2 and LaSalle surveillance data are required by Appendix H, 10 CFR 50, to be submitted for staff review. Hence, the staff and the applicant should be able to utilize the WNP-2 and LaSalle surveillance data to monitor the effect of neutron irradiation on the NMP-2 vessel.

On the basis of the previous discussion, the applicant has demonstrated the proposed integrated surveillance program complies with the criteria in Section II.C of Appendix H, 10 CFR 50. Compliance with the criteria in Section II.C of Appendix H, 10 CFR 50, ensures that the effect of neutron irradiation on the NMP-2 reactor vessel beltline materials will be monitored throughout the life of the plant.



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