

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 21 TO FACILITY OPERATING LICENSE NO. NPF-3

THE TOLEDO EDISON COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

Introduction

By letter dated July 27, 1979, supplemented by letter dated August 17, 1979, the Toledo Edison Company (TECO or the licensee) requested an amendment to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse 1).

The amendment would change the Technical Specifications (TSs) by (1) extension of the calendar time to perform the first inservice inspections (ISI) of steam generator (SG) tubes after initial criticality, (2) special provisions for certain categorization of degraded and/or defective SG tubes in various defined groups, and (3) inspection interval requirements based on the categorization of the results of inspections of SG tubes.

Discussion

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With regard to item (1) above, Section 4.4.5.3.a of the TSs requires that the first ISI of the SG tubes be performed after six effective full power months, but within 24 calendar months of initial criticality. Because Davis-Besse 1 has incurred a number of plant outages (seven months, 22 days - or approximately 232 effective full power days) since initial criticality on August 12, 1977, the first scheduled refueling outage has slipped to March 1980. Therefore, the licensee has requested relief from the TS provisions to permit the first ISI to be coincident with the first scheduled refueling outage.

With respect to item (2) above, operating experience to date with Babcock and Wilcox (B&W) designed SGs indicates that tube degradation is most likely to occur in localized areas adjacent to the tube inspection lane and in the vicinity of the 15th tube support plate where tubes pass through drilled, as opposed to broached, holes*. It is believed that degradation preferentially occurs in these areas because of the local combination of flow conditions and fluid properties. The current TS for SG tubes requires, and the proposed TS change would require,

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* A broached hole is typically a fluted circle rather than a plain circle.

that 50% of the first sample of tubes selected for inspection (3% of the total number of tubes in all SGS) be from this area (where experience indicates critical areas to be inspected). As an alternative to this requirement, the licensee proposed to define one or more areas in the SGs where experience has indicated that degradation is most likely, and to optionally perform an inspection of all of the tubes in these areas in both SGs. In addition, the licensee would inspect the tubes not so inspected in accordance with the general provisions of the proposed TS. The criteria for the second and third sample inspections for the general SG group would be based on the results of the general SG tube group inspection, independent of the defined group inspection results when the defined group would be 100% inspected. According to the licensee's proposal, the number of tubes inspected in the defined potential problem area(s) would not reduce the number of tubes examined in the associated general inspection; but at the same time, degraded or defective tubes identified in defined potential problem areas would not be used in determining the results category for the general inspection and vice versa.

With regard to item (3) above, the current TS requires the inspection results to be classified into one of three categories (Specification 4.4.5.2) depending upon the number of defective or degraded tubes discovered. This results category determines the repairs that must be performed; the additional inspection required at that outage, if any; whether prompt reporting of the results to the NRC is required; and the maximum permissible interval until the next inspection is conducted. The licensee is proposing that the maximum inspection interval to the next ISI be determined separately for each SG tube group based upon the results category for that group. This will provide for an increased frequency of inspection for a problem area, without reducing the frequency of general SG tube inspections.

Evaluation

As for item (1), the licensee is requesting relief from Specification 4.4.5.3.a to permit the first ISI to coincide with the first refueling outage now scheduled for March 1980. This represents approximately a seven-month extension and is justified by the licensee on the basis of the total accumulated outage time of seven months 22 days since initial criticality. It is our evaluation that any tube degradation which may have occurred during the periods of wet layup has not added significantly to the tube degradation that would normally be incurred in a two-year interval. The most significant form of tube degradation observed in B&W units to date is circumferential cracks induced by fatigue. These fatigue cracks are due to mechanical sources such as flow induced vibration which does not exist during periods of wet layup. Experience has shown that tube degradation due to corrosion mechanisms such as wastage and denting is not a problem for B&W units. Indeed, the denting phenomena has yet to be observed in any B&W unit. Therefore, we find it acceptable to extend the specified 24-calendar month interval before the first inservice inspection by the seven month 22 day outage time accumulated to date.

To ensure that any subsequent outages which may occur prior to March 1980 will not result in further slippage of the first ISI, the licensee has agreed to a provision in the TSs which states that the first ISI shall be performed by April 30, 1980.

As for item (2), the licensee is proposing that the tubes in the SGs be classified into two groups: (1) a group of tubes in well-defined areas where experience has indicated that tube degradation is most likely (the defined group)

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and (2) the balance of the tubes in the SGs. The licensee is also proposing that, at their option, these groups may be subject to different inspection requirements. Socifically, the licensee may or may not elect to perform an inspection of every tube in the defined group in both SGs. If they elect to perform such an inspection, the balance of the SG tubes will be subject to the normal inspection requirements with no reduction of sample size. At the same time, degraded or defective tubes identified within the defined group will only be used to establish the results category for that group and not for the overall population of tubes.

On the other hand, if the licensee elects to not inspect every tube in the defined group in both SGs, the specifications would require that the normal inspection be performed. In this case, the specifications would require that at least 50% of the tubes inspected be in areas where experience has indicated potential problems. Accordingly, with either option, inspection of tubes in potential problem areas is emphasized. Under the provisions of the licensee's proposed revision, however, all of the tubes in these areas may be inspected Therefore, we conclude that with the proposed revision the extent of the inspection of tubes in potential problem areas is not diminished and may be increased. In addition, we conclude that the extent of the inspection of the balance of the SG tubes is not reduced.

As for item (3), we find the proposed requirements governing inspection intervals of the inspection of a defined group of tubes would increase the number of inspections of a problem area, yet not reduce the general SG tube inspections.

Based upon the foregoing, we conclude that extending the 24 calendar month interval before the first inservice inspection by the outage time accumulated to date does not significantly increase the probability of a tube failure prior to the first inspection more than what currently exists for the specified 24 calendar month interval assuming no outages. Thus, this change to the TSs is acceptable. We further conclude that the inclusion in the TSs of provisions for (1) electively inspecting all tubes in defined areas and (2) determining the inspection intervals for the defined areas from the inspection results of the respective defined areas does not reduce the effectiveness of the overall SG tube inspection program and is therefore acceptable.

Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR $\frac{1}{5}1.5(d)(4)$, that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

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Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: October 2, 1979

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