

10 CFR 50.59 EVALUATION
FOR
CRD HOUSING SUPPORT CLEARANCE
LA SALLE COUNTY STATION

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I. SUBJECT

This safety evaluation justifies a permanent plant modification of increasing the nominal clearance between the lower surface of the control rod drive (CRD) flange capscrews and the CRD support structure (shoot-out steel) from 1 inch to 1.5 inches at ambient temperature. The purpose of this modification is to facilitate under vessel maintenance work, thereby reducing radiation exposure to plant personnel.

This change will not affect the CRD housing, and will not adversely affect the capability of the support structure to perform its intended function to limit the downward motion of a control rod following a postulated CRD housing failure.

II. DISCUSSION

The proposed modification will allow increasing the nominal clearance between the lower surface of the CRD flange capscrews and the CRD support structure from 1 inch to 1.5 inches at ambient temperature. The implementation of this modification will require a change to UFSAR Section 4.6.1.2. Specifically, the following assumptions are revised:

1. The postulated CRD housing force is based on the operating pressure value of 1086 psig in place of the vessel design pressure of 1250 psig currently stated in the UFSAR. This change is justified since this load condition event is most likely to occur under normal plant operation when the drives are being used and the maximum housing stress condition develops from a stuck rod scram. Vessel design pressure occurs only during hydrotest before startup when there is no associated drive operation. The application of the vessel operating pressure, combined with the CRD and blade weights, results in total force of 32,000 lbs instead of the 35,000 lbs currently stated in the UFSAR. It should be noted that the vessel operating pressure is the licensing basis for the BWR/6 CRD support design which uses the same hardware as LaSalle and has been accepted by the NRC.

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2. The current UPSAR assumes an impact factor of 3 (with a total force of 105,000 lbs) to account for the 1 inch gap. Due to the increased gap, the impact factor is revised to be 3.75, resulting in a total force of 120,000 lbs.

The capability of the support structure to limit the CRD motion to 6 inches has been evaluated in Reference 1. It has been demonstrated that the total deflection of an ejected CRD will be limited to 3.65 inches. Therefore, even with the increase load caused by the higher clearance, the support structure will perform its intended function, and will limit the motion of an ejected control rod drive to 6 inches. Therefore, the proposed modification does not affect the conclusion of UPSAR Section 15.4.8 (Spectrum of Rod Ejection Accidents). Also, this modification does not affect any of the sequence of events and conclusions presented in UPSAR Sections 15.4.1 and 15.4.2 (Rod Withdrawal Errors), and 15.4.3 (Control Rod Misoperation) because these events do not result in CRD ejection and their cause and/or mitigation is not affected by the increased clearance.

The proposed modification does not impact any other design requirements such as equipment qualifications, fire protection, seismic design, or separation criteria.

The proposed modification requires a change to the Bases of the Technical Specifications, Reactivity Control Systems, Section B3/4.1.3 Control Rods. UPSAR Sections 4.6.1.2.3 (Page 4.6-17) and 4.6.2.3.1.2.1 (Page 4.6-19) will be revised to reflect the changes introduced by this modification.

III 50.59 SAFETY EVALUATION

- a. Is the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report increased?

No. The CRD support structure is intended to mitigate the consequences of a potential Rod Ejection accident (UPSAR Section 15.4.8). The CRD support

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structure is not considered in the initiation of this event, therefore, the proposed modification does not increase its probability of occurrence. The CRD support structure is considered in the mitigation of a Rod Ejection accident. However, the proposed modification will result in a lower total force on the support structure from an ejected rod as discussed in Section II.1. Therefore, the capability of the support structure to perform its intended function is not adversely affected, and the consequences of a postulated Rod Ejection event are not increased by the proposed modification.

b. Is the possibility for an accident or malfunction of a different type than any evaluated previously in the safety analysis report created?

No. The proposed modification does not result in any change in the design of the CRD system. The increased clearance between the CRD flange capcrews and support structure will not initiate a new malfunction of the CRD system, and it will not prevent any of the CRD components from performing its intended function. UFSAR Section 15.4.8 states that the Rod Ejection accident is not applicable to the BWR. As discussed in item III.a above, the capability of the CRD support structure to perform its intended function is not adversely affected by the increased clearance, therefore, the UFSAR conclusion remains valid.

c. Is the margin of safety as defined in the basis for any technical specification reduced?

No. Technical Specification 3.1.3.8 requires that the CRD support structure be in place during Operational Conditions 1, 2, and 3. This requirement is not affected by the proposed modification. In addition, the proposed modification does not affect the capability of the CRD structure to perform its intended function as described in the Bases for Section 3/4.1.3 (Reactivity Control Systems). However, the Bases do require an information change. Technical Specification B3/4.1.3 currently states the outward movement of a control rod will be restricted to less than 3 inches in the event of a CRD housing failure. This will be reworded to read that the housing support will limit the outward movement of a control rod to 3.65

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inches in the event of a housing failure. The UYSAR transient and accident analyses remain bounding. Therefore, there is no reduction in the margin of safety as defined in the Technical Specification Bases.

IV. CONCLUSION

Increasing the clearance between the CRD housing flange capcrews and the support structure as described in Section I of this Safety Evaluation does not affect the safe operation and shutdown capability of the LaSalle 1&2. Based on the above evaluation, this modification does not constitute an unreviewed safety question.

V. REFERENCES

1. GE document 386HA243 (markedup) contained in DRF B13-01503.