



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 65 TO

FACILITY OPERATING LICENSE NO. NPF-38

ENTERGY OPERATIONS, INC.

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By application dated July 25, 1990, Entergy Operations, Inc. requested changes to the Technical Specifications for Waterford Steam Electric Station, Unit 3. Over the past several years, there has been increased effort to improve the reliability of the shutdown cooling system (SDCS) in pressurized water reactors. It was recognized that automatic suction isolation valves (ACI) on suction isolation valves of the SDCS have been a frequent cause of loss-of-SDCS events. The proposed changes will remove the ACI and add administrative controls. The present Technical Specification requires the plant to verify operation of the SDCS ACI and open permissive interlock (OPI) at least once every 18 months. The changes would delete the surveillance requirement for the ACI and specifically identify the OPI. Testing of the SDCS isolation valves position alarms would be added to the surveillance requirement. These changes would be made in conjunction with a Station Modification (SM) removing the ACI function from the plant. By letter dated November 7, 1990, the licensee provided further clarifications to the proposed amendment. These clarification did not change the substance of the proposed amendment and did not affect the staff's finding of no significant hazards considerations.

2.0 DISCUSSION

The staff review of this issue has focused on the effect that the proposed change has on the Event V (intersystem LOCA outside of containment) sequence and on the availability of the SDCS. We have reviewed the licensee's PRA analysis of the Event V sequence. We have reviewed and approved the removal of the ACI for several other plants. Waterford 3, however, is different from these plants in two respects. First, Waterford 3 is the first Combustion Engineering plant to request this modification. Second, the plants for which the removal of the ACI has been approved did not previously have the alarm on the SDCS isolation valve position. Thus, they were removing the ACI and adding the alarm as well as the administrative controls. Waterford 3 already had the alarm.

Combustion Engineering (CE) performed the evaluation of the removal of the ACI as a means to improve shutdown cooling for Waterford 3. The evaluation addresses the following guidelines, A through G, for ACI removal recommended by the NRC in a memorandum from B.W. Sheron dated January 28, 1985.

- A. the means available to minimize Event V concerns. Waterford 3 has a double barrier between the RCS and the SDCS. Alarms, procedural controls, and the OPI minimize the potential that the double barrier will not be available. Also, there is a third isolation valve in each SDC line.
- B. Alarms to Notify the Operator that SCS Suction Valves are Mispositioned. Visual and audible alarms are in the main control room to inform the operator that the SDCS suction valves are not fully closed when the RCS pressure is above the SDCS operating pressure. The alarms will be tested at each refueling and are designed to alert the operator of alarm circuit failure. Operating procedures instruct the operator to discontinue pressurization and close the isolation valves if they are not fully closed and pressure is increasing above the alarm setpoint.
- C. Verification of the Adequacy of Relief Valve Capacity. Original design calculations to ensure that relief devices in the SDCS suction lines had adequate capacity to prevent overpressurization of the SDCS as described in FSAR Section 9.3.6.2.2 have been reviewed to confirm that ACI was not credited in the selection of the limiting events or mitigation of the resulting transients.
- D. Means other than ACI to Ensure that both Isolation Valves are Closed. Alarm, position indication, procedures, and training are used to ensure that the isolation valves are closed.
- E. Assurance that the OPI is not Affected by ACI removal. The OPI function will be maintained in its present form, however, the pressure at which the OPI function will be verified will be changed to just above the 392 psia OPI setpoint.
- F. Assurance that Valve Position Indication will Remain Available in the Control Room After ACI removal. The modification provides for continuous valve position indication on the main control board. This indication will be present even when the valve position is locked out during power operation. The position indication is independent of the alarms.
- G. Assessment of the Effect of ACI Removal on SDCS Availability and LTOP. CE performed an analysis on the impact of removing the ACI from the SDCS. The analysis was performed to determine the change in Interfacing System LOCA (ISLOCA) frequency, the change in SDCS unavailability, and the impact on mitigating LTOP events due to removal of the ACI.

#### ISLOCA Results

The results indicate no difference in ISLOCA probability for the two cases.

### SDCS Unavailability Results

<u>SDCS Configuration</u>	<u>SDCS Unavailability</u>
SCS suction valves with ACI	5 E-02
SDCS suction valves without ACI	3 E-02

The change in SDCS unavailability represents about a 40% decrease in unavailability during refueling outages.

### Mitigating LTOP Events

Waterford 3 employs six inch relief valves in the SDCS with sufficient capacity to mitigate LTOP events that may occur during shutdown cooling operations. Because these valves are located downstream of the inside containment SDCS suction valves, inadvertent closure of the SDCS valves by ACI will isolate the relief valves and eliminate protection of the RCS piping if an LTOP event occurs. Since the removal of the ACI decrease the unavailability of the SDCS, the number of inadvertent closures of the SDCS decreases and the availability of the relief valves (for LTOP protection) increases.

### 3.0 SUMMARY

The staff finds that the removal of the ACI at the Waterford Steam Electric Station, Unit No. 3 produces a safety benefit in the SDCS availability and no change in the ISLOCA frequency. Thus, the total impact is a safety benefit and is acceptable for Waterford.

### 4.0 CONTACT WITH STATE OFFICIAL

The NRC staff has advised the Administrator, Radiation Protection Division Department of Environmental Quality, State of Louisiana of the proposed determination of no significant hazards consideration. No comments were received.

### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment involves a change in a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposures. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding.

Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Section 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 6.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 9, 1991

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