



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RE: MAXIMUM DRYWELL TEMPERATURE

GPU NUCLEAR CORPORATION

JERSEY CENTRAL POWER AND LIGHT COMPANY

OYSTER CREEK NUCLEAR GENERATING STATION

DOCKET NO. 50-219

1.0 INTRODUCTION

By letter dated August 1, 1985, GPU Nuclear (the licensee) submitted a topical report on its evaluation to increase the normal drywell temperature operating limit. The licensee has reconsidered the maximum allowable drywell temperature prior to the design basis loss-of-coolant accident (LOCA) and two other events for Oyster Creek. These other events are the Main Steam Line Break (MSLB) inside the drywell for defining the environmental qualification temperature profile (EEQ profile) inside the drywell and the loss of drywell cooling which defines the limiting drywell temperature condition for the Remote Shutdown Panel. The licensee has determined that a maximum allowable drywell temperature of 150°F poses an insignificant reduction in safety margin for the containment in withstanding these events and does not present any concern relative to the drywell's steel and concrete structural components, and it is safe to permit normal plant operations up to the 150°F.

2.0 EVALUATION

The topical report submitted by the licensee is based on a series of CONTEMPT computer code analyses which were run to determine the sensitivity of the primary containment response for three events starting from different initial drywell temperatures. The primary containment is the drywell and the torus.

The primary containment consists of a pressure suppression system with two large chambers. The drywell houses the reactor vessel, the reactor coolant recirculating loops, and other components associated with the reactor system. It is a 70-ft diameter spherical steel shell with a 33-ft diameter by 23-ft high cylindrical steel shell extending from the top. The torus is a steel shell, located below and around the base of the drywell. It has a major diameter of 101 ft, a chamber diameter of 30 ft, and is filled to approximately a 12-ft depth with water. The two chambers are interconnected through ten vent pipes equally spaced around the circumference of the torus, which feed into a common header inside the torus.

The staff has completed its review of the licensee's submittal dated August 1, 1985, which provides the technical basis for changing the Emergency Operating Procedures (EOP) on primary containment entry. The licensee proposed to increase the allowable bulk drywell temperature from 135°F to 150°F. The following summarizes our evaluation of the licensee's submittal.

The licensee analyzed three cases to evaluate the effects of increasing the bulk drywell temperature from 135°F to 150°F. They include the DBA LOCA, a 0.75 ft MSLB (EEQ profile), and the loss of drywell cooling (Remote Shutdown Panel Performance Analysis). For each case, two calculations were performed by the licensee using the CONTEMPT computer code; i.e., the selected initial drywell temperatures were 135°F and 150°F. The CONTEMPT code models the primary containment as two separate nodes, drywell and torus, with an average bulk temperature and pressure. The results of the LOCA and MSLB analyses illustrate that the differences in the peak pressures and peak temperatures due to variations in the initial drywell temperature are insignificant, i.e., within a few degrees or one psi. In the third case, loss of drywell cooling, the drywell temperature profiles differ by approximately 15°F throughout the transient, with the 150°F initial drywell temperature case having the higher temperature profile. However, both temperature profiles are much lower than the drywell temperature design value.

Based on our review of these containment analyses, we find the licensee's proposal to base the EOP entry condition on a bulk drywell temperature of 150°F (instead of 135°F) is technically justifiable and, therefore, acceptable.

### 3.0 CONCLUSION

Based on the above, the staff concludes that a maximum drywell bulk temperature of 150°F for Oyster Creek is acceptable.

The Appendix A Technical Specifications (TS) for Oyster Creek do not have limiting conditions for operation or surveillance requirements on the maximum drywell temperature. Such TS on this temperature are in the General Electric Boiling Water Reactor Standard Technical Specifications (BWR-STs) NUREG-0123 Revision 4 and should be in the Oyster Creek TS because it is an important part of the design basis of the station and is subject to the manner in which the plant is operated. Such TS would provide assurance that the drywell temperature does not exceed the safety analysis. You are requested to propose appropriate limiting conditions for operation and surveillance requirements for the maximum allowable drywell bulk temperature for Oyster Creek or a justification for not needing these TS before the restart from the Cycle 11 refueling (Cycle 11R) outage scheduled now to begin in April 1986 because the plant will not be operating in the hot summer months during which the drywell has the highest temperatures until after the restart from the Cycle 11R outage. We request that you also provide the algorithm for determining the drywell bulk temperature and a justification for the algorithm or propose a TS for the drywell peak temperature.

You stated that an evaluation was being made on the aging effect of the 150°F drywell temperature on environmentally qualified equipment inside the drywell. Please provide the date when this will be submitted to the staff.

IV. ACKNOWLEDGEMENT

This evaluation was prepared by A. Notafrancesco.

Dated: November 22, 1985