



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 46 TO FACILITY OPERATING LICENSE NO. DPR-80
AND AMENDMENT NO. 45 TO FACILITY OPERATING LICENSE NO. DPR-82
PACIFIC GAS AND ELECTRIC COMPANY
DIABLO CANYON NUCLEAR POWER PLANT, UNIT NOS. 1 AND 2
DOCKET NO. 50-275 AND 50-323

1.0 INTRODUCTION

By letter dated August 15, 1989 (Reference LAR 89-09), Pacific Gas and Electric Company (PG&E or the licensee) requested amendments to the combined Technical Specifications (TS) appended to Facility Operating License Nos. DPR-80 and DPR-82 for the Diablo Canyon Power Plant (DCPP), Unit Nos. 1 and 2, respectively. The amendments change the TS to (1) allow the use of a temporary source range detector during refueling if one of the two permanently installed excore source range detectors fails, (2) clarify that certain activities, which do not significantly affect core reactivity, are not considered core alterations, (3) require containment closure during movement of the reactor vessel upper internals and head, and (4) allow latching the control rod mechanism shaft to the rod cluster control assemblies (RCCAs or control rods) and friction testing of individual control rods with one operable source range detector.

The amended TS will apply to two situations that may occur if one of the two permanent source range detectors fails during refueling. The two situations are: (1) The amended TS will permit core reconstitution to be conducted with an inoperable permanent detector if a temporary detector is made operable. In this event, the temporary detector (three fission chambers connected in parallel) will be lowered into the core region of the vessel to act as the second source range detector. (2) The amended TS will permit latching and friction testing of the RCCAs with only one operable source range detector. In this event, the temporary detector can not be used because the upper reactor vessel internals will prevent the temporary detector from being lowered into the core region.

The staff evaluation of these changes is given below.

2.0 EVALUATION

The NRC staff has evaluated the proposed changes and finds them acceptable, based on the analyses and evaluations given by the licensee. A discussion of each of the specific technical specification changes made by these amendments, in the order of TS number, is presented below.

- (1) TS 1.10, "Core Alterations" (Definition), is revised to restrict the definition of core alterations to cover only activities which may significantly affect core reactivity.

Specifically, the definition of "core alterations" has been revised to include only the movement or manipulation of fuel, fuel sources, and reactivity control components within the reactor vessel. The previous TS defined "core alterations" as the movement or manipulation of any component within the reactor vessel. The revised TS will permit a temporary source range detector or other small components, such as cameras, tools, etc., to be moved or manipulated within the reactor vessel without this activity being considered a "core alteration." In addition, the revised TS will permit the reactor vessel head and the upper vessel internals to be moved over the fuel without constituting a "core alteration."

In support of this change, the licensee states that insertion of small components into the reactor vessel will have no effect on reactivity since these items displace a small volume of borated water, and sufficient borated water will surround the components and provide the necessary neutron absorption to neutronically isolate them from the reactor. The licensee specifically evaluated the effect on reactivity of lowering the temporary source range detector into the vessel, and concluded that it will increase source strength slightly, but will not affect reactivity. Also, the licensee showed that the consequences of dropping one of these small components into the vessel are bounded by the fuel handling accident discussed in Section 15.4.5.1.3 of the FSAR, in which a fuel assembly is assumed to be dropped onto the core.

The licensee stated that movement (removal and/or installation) of the upper reactor vessel internals is the only activity allowed by the modified TS that will displace a large enough volume of borated water to potentially affect reactivity. However, the upper plenum and the associated structures physically separate the the upper internals from the core by a distance of at least 11 inches. In this regard, the licensee states that its contractor, Holtec International, has performed a safety evaluation to determine whether or not movement of the upper internals will have any effect on reactivity. The analysis showed that a 9-inch separation is sufficient to neutronically decouple the upper internals from the core, thereby demonstrating that movement of the upper internals will not affect reactivity.

The licensee further stated that movement of the reactor vessel head over the fuel does not displace borated water near the reactor core, and therefore does not affect reactivity.

The NRC staff has reviewed the licensee's evaluations described above and find them acceptable, based on the analysis and evaluation given by the licensee.

- (2) TS 3.9.2, "Instrumentation", is revised to allow latching the control rod drive shaft mechanisms to the associated rod cluster control assemblies and friction testing of individual control rods with only one operable source range detector.

RCCA latching and friction testing is conducted with the reactor vessel upper internals in place, thereby preventing the lowering of a temporary source range detector into the region of the core. This TS change will permit the control rods to be moved one at a time with only one operable source range detector. Friction testing, which involves fully withdrawing and reinserting each rod in turn, could change core reactivity by as much as one percent for the most reactive rod. The corresponding count rate change on a source range detector is calculated to be about one to two counts per second. Because the core is geometrically coupled, one source range detector will detect significant reactivity changes associated with control rod movements.

The licensee will continue to meet the five percent shutdown margin requirements of TS 3/4.9.1 including a one percent delta-k/k allowance for uncertainties. The requirement to meet this TS is independent of the number of operable detectors. The required uncertainty allowance alone is greater than the worth of the most reactive withdrawn rod. The licensee has stated that the rods are friction tested using a load cell to lift each rod. The rods can not be latched in the fully out position, thereby precluding more than one rod being withdrawn at a time. Therefore, the use of one source range detector during latching and friction testing of control rods is adequate for reactivity monitoring and does not compromise the core shutdown margin.

Based on the above, the licensee concludes that no adverse safety consequences result from the use of one source range detector while latching control rods and performing control rod friction testing.

The NRC staff has reviewed the licensee's evaluation and finds that it provides an acceptable basis for allowing the control rod cluster assemblies to be latched and friction tested with one source range monitor.

- (3) TS 3/4.9.4, "Containment Penetrations", is revised to require containment integrity during movement of the reactor head and upper internals over fuel.

This TS change is necessary to provide assurance that containment integrity is maintained during movement of the reactor vessel head and the reactor vessel upper internals over the fuel. Under the old TS, movement of the upper internals was defined as a "core alteration." Since the revised definition of "core alteration" (TS 1.10) no longer covers movement of this component, a change in TS 3/4.9.4 is necessary to maintain the same degree of protection against an offsite release of radioactivity due to dropping the upper internals onto the core. Inclusion of the reactor vessel head in TS 3/4.9.4 is an additional restriction proposed by the licensee.

The NRC staff has reviewed the licensee's evaluation of this TS change and finds it acceptable, since it maintains and, in the case of the reactor vessel head, improves the protection against an accidental release.

- (4) The bases for TS 3/4.9.2, "Instrumentation," are revised to state that a temporary source range detector may be used if the temporary detector is functionally equivalent to the permanently installed source range detectors.

This section is modified to describe the circumstances under which the temporary source range detector will be used. The staff has reviewed these changes and finds them acceptable because they appropriately describe the use of the temporary source range detector.

In summary, the NRC staff has reviewed the request by the Pacific Gas and Electric Company to modify the combined Technical Specifications for Diablo Canyon Units 1 and 2 to allow the use of a temporary source range detector, and finds it acceptable, as discussed above.

3.0 ENVIRONMENTAL CONSIDERATION

These amendments involve changes in the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and a change in surveillance requirements. At Diablo Canyon, the restricted area coincides with the site boundary. We have determined that the amendments involve 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 exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration and there has been no

public comment on such finding. Accordingly, these amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 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 these amendments.

4.0 CONCLUSION

We have 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 (3) the issuance of these amendments will not be inimical to the common defense and security or the health and safety of the public.

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Dated: October 30, 1989