



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 142 TO FACILITY OPERATING LICENSE NO. NPF-21  
WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
NUCLEAR PROJECT NO. 2  
DOCKET NO. 50-397

1.0 INTRODUCTION

By letter dated December 6, 1993, the Washington Public Power Supply System (WPPSS or the licensee) requested changes to the Technical Specifications (Appendix A to Facility Operating License No. NPF-21) for the WPPSS Nuclear Project No. 2. The letter superseded a request made by letter dated March 18, 1992. The proposed changes would revise the Surveillance Requirement 4.6.6.1.b.3 to provide more appropriate acceptance criteria for demonstrating operability of the primary containment hydrogen recombiner systems.

2.0 EVALUATION

The surveillance requirement in TS 4.6.6.1.b.3 pertains to the operability of the catalyst beds in the primary containment hydrogen recombiner systems in the containment atmosphere control (CAC) system. The changes to the TS are being made to provide more appropriate acceptance criteria for demonstrating operability of the catalyst beds, since the licensee determined that the present temperature rise acceptance criteria is not, by itself, an accurate reflection of catalyst operability. Specifically, it was determined that the acceptance criteria is very dependent on the analytical methods of calculating the input parameters and measurement of performance indicators (i.e., hydrogen concentration, process flows and temperatures). Depending on the methods of calculating the input parameters, it was determined that the required temperature rise can vary significantly. In addition to the analytical methods used to determine the input parameters, other factors such as heat removed by the gas flow; heat capacity of the catalyst bed and the vessel; heat losses through vessel insulation, supports and piping; time lag; and heat loss caused by temperature sensors and uncertainties in flow determination during testing, all led to the conclusion that the present criteria was not, by itself, an accurate reflection of catalyst operability.

As a result, the licensee proposed a change to TS 4.6.6.1.b.3 which includes two methods to monitor the effectiveness of the catalyst beds; one test will examine the temperature profile through the bed, which will indicate the relative location of the catalytic reaction, while the other will determine the operability of the catalyst by comparing the hydrogen content in the influent and effluent process streams. Successful tests will show that the recombination process is occurring near the top of the bed (i.e., at least 75 percent of the maximum temperature rise occurs before the fourth temperature

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device), with an adequate level of recombination (i.e., with the introduction of at least 1 percent by volume hydrogen into the catalyst bed, the effluent stream has a hydrogen concentration of less than 25 ppm by volume).

If the catalyst activity is degraded for any reason, the reaction will take place further into the bed and the location of the peak temperature will move accordingly. Therefore, taking temperature readings of the catalyst bed during the surveillance to determine the location of the maximum temperature increase and verification that at least 75 percent of the temperature increase occurred in the area of the first three in-bed detectors will provide the data that supports the analysis of the catalyst's capability. In addition, if the maximum temperature rise occurs near the bottom of the bed (i.e., on the last RTD), verification that at least 75 percent of the increase was achieved above that RTD indicates that the lower portion of the bed is still capable of providing the necessary catalytic function.

Degradation of the catalyst bed will also be indicated by a decreased ability to recombine hydrogen and oxygen. Therefore, it was concluded that sampling of the influent and effluent gases would be a direct indication of catalyst efficiency. An appropriate acceptance criterion is the sampling of the effluent gas stream for hydrogen concentration for a defined input volume percent of hydrogen. A sample retaining less than 25 ppm by volume after passing through the catalyst bed indicates acceptable recombiner operation for a feed of at least 1 percent hydrogen by volume. In addition, the catalyst bed should maintain a relatively constant capacity for recombination. If the comparison of the influent and effluent hydrogen concentrations begins to indicate a degradation of the catalyst bed, replacement of the bed will be evaluated.

Based on the above, the proposed changes to Surveillance Requirement 4.6.6.1.b.3 provide more appropriate acceptance criteria for demonstrating operability of the primary containment hydrogen recombiner systems, and are therefore acceptable.

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Washington State official was notified of the proposed issuance of the amendment. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes 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 surveillance requirements. The NRC 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 exposure. 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 (59 FR 34670). Accordingly, the amendment meets 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 the amendment.

#### 5.0 CONCLUSION

The Commission 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, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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