SAFETY EVALUATION
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEM SAFETY AND ANALYSIS
PLANT SYSTEMS BRANCH
REVISED TORNADO DESIGN CRITERIA
WASHINGTON PUBLIC POWER SUPPLY SYSTEM NUCLEAR POWER PROJECT NO. 2
DOCKET NO. 50-397

1.0 INTRODUCTION

By letter dated October 10, 1995 Washington Public Power Supply System (WPPSS or the licensee) requested the staff's approval to revise the tornado design criteria for the Nuclear Power Project Unit 2 plant, (WNP-2). The WNP-2 current licensing basis tornado design criteria are for wind speeds of 300 miles per hour (mph) rotational and 60 mph translational. The proposed change, as requested in the October 10, 1995 submittal would revise the criteria to establish the total design basis tornado wind speed at 200 mph (160 mph rotational and 40 mph translational). The request is based on the design basis tornado characteristics (for the tornado intensity region in which WNP-2 is located) accepted by the staff in the Final Safety Evaluation Report Related to the Certification of the Advanced Boiling Water Reactor Design, NUREG-1503, July 1994.

2.0 EVALUATION

The current licensing basis tornado design criteria for WNP-2 are based on a Region I plant site as defined in Regulatory Guide (RG) 1.76 "Design Basis Tornado for Nuclear Power Plants." These are excessive criteria for WNP-2 because it is located in Region III as defined in RG 1.76. The licensee's proposed tornado wind speed is also less than the wind speed identified in RG 1.76 for a design basis Region III tornado. This further reduction in tornado design criteria is consistent with the design basis characteristics accepted by the staff in NUREG-1503. Table 2-1 of NUREG-1503 establishes revised design-basis tornado characteristics that are acceptable to the staff. The licensee's proposed revision is consistent with that table.

In NUREG-1503, the staff refers to SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs," dated April 2, 1993, as a basis for revised tornado wind speeds. As described in SECY-93-087, the staff reevaluated the regulatory positions in RG 1.76 using the considerable quantity of tornado data which has become available since RG 1.76 was developed. This reevaluation is discussed in NUREG/CR-4661, "Tornado Climatology of the Contiguous United States," dated May 1986. Based on the updated tornado data and the analysis provided in NUREG/CR-4661, the staff concluded (SECY-93-087) that it is acceptable to reduce the tornado design basis wind speeds to 322 kilometers per hour (km/hr) [200 mph] for states west of the Rocky Mountains, and 482 km/hr (300 mph) for states east of the Rocky Mountains. The staff, therefore, concludes that the licensee's proposed reduction in design basis tornado wind speed to 200 mph is acceptable for WNP-2 which is located west of the Rocky Mountains. The licensee's proposed pressure drop and rate of pressure drop associated with

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the 200 mph tornado are also acceptable because they are consistent with the design-basis tornado characteristics found acceptable to the staff in Table 2-1 of NUREG-1503.

The licensee has also proposed a new (new to WNP-2) tornado missile spectrum associated with the revised design basis tornado and has calculated the impact velocities based on the reduced wind speed of 200 mph. The licensee has used Missile Spectrum II identified in Section 3.5.1.4 of the Standard Review Plan (SRP). Based on the missile spectrum being consistent with Section 3.5.1.4 of the SRP, the staff concludes that it is acceptable.

It should also be recognized that the tornado design basis requirements have been used in establishing structural requirements (minimum concrete wall thicknesses) for the protection of safety related structures, systems, and components against effects not covered explicitly in review guidance such as RGs or the Standard Review Plan. Specifically, some aviation (general aviation light aircraft) crashes, nearby explosions, and explosion debris or missiles have been reviewed and evaluated routinely by the staff by taking into account the existence of the tornado protection requirements. Therefore, for any new structures that are built using the revised tornado design criteria, the licensee should perform an analysis under 10 CFR Part 50.59, to verify that the structures are adequate (minimum wall thickness) to protect against other postulated site-specific hazards or loads that may have been previously subsumed within the tornado design basis.

3.0 CONCLUSION

Based on the above evaluation, the staff concludes that the licensee's proposed revised criteria for the deign basis tornado are in accordance with the guidelines of RG 1.76 regarding the missile spectrum and with the staff's revised design-basis tornado characteristics set forth in NUREG-1503. The staff, therefore, concludes that the proposed changes are acceptable.