



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 57 TO FACILITY OPERATING LICENSE NO. DPR-42
AND AMENDMENT NO. 51 TO FACILITY OPERATING LICENSE NO. DPR-60
NORTHERN STATES POWER COMPANY
PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT NOS. 1 AND 2
DOCKET NOS. 50-282 AND 50-306

Introduction

By letter dated August 6, 1982, Northern States Power Company (the licensee) requested a change to the Technical Specifications (TS) for the Prairie Island Nuclear Generating Plant, Unit Nos. 1 and 2. This change would extend the current monthly surveillance period for the turbine governor and steam stop valves (Table T.S.4.1-2A Item 11) up to 60 days at end of cycle by waiving the closure tests when boron concentration is less than 150 ppm.

Discussion

Operability of the turbine governor and stop valves is tested monthly to assure the capability to control turbine speed in case of an unexpected loss of load. Failure of these valves could result in a failure of the turbine rotor and damage due to resultant missiles.

For end of cycle operations, performance of the closure tests leads to operational problems. Power must be reduced to 50%, which makes it difficult to maintain the axial flux difference within TS limits. The low boron concentration also requires processing of large amounts of reactor coolant to overcome xenon peaking and flux tilts become difficult to control. The licensee has requested a waiver of the test for end of cycle operations only.

Evaluation

Steam admission to the turbine is controlled by two valves in series; (1) the governor valve and (2) the turbine stop valve. Turbine overspeed is controlled by three independent speed sensors. The primary overspeed control is provided by an electro-hydraulic system set to close the main steam governor and reheat steam intercept valves at 103% of rated turbine shaft speed. Backup speed control is furnished by a mechanical overspeed mechanism set to close main steam stop valve at 111% of rated turbine shaft speed. In addition, electro-hydraulic

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Christina J. Koran

control system furnishes a third backup which closes all steam valves when the turbine exceeds 111% of rated speed by 10 R.P.M. This redundancy in both valves and controls provides reasonable assurance that turbine speed control will be maintained thus preventing turbine over-speed that could result in a turbine missile accident.

The testing history of these valves shows that over 100 monthly tests since plant startup (i.e., Unit 1, 1973 and Unit 2, 1974) reveal that not a single instance occurred where the valve failed to operate properly. In addition, the turbine stop and governor valves operated properly in all instances when the trip signal to close the valve was initiated due to reactor scrams. The operating history shows that more than 210 valve actuations occurred (i.e., includes testing, reactor scrams startups and shutdowns) since the units became operational without a single valve or control system malfunction. Such trouble-free operation of these valves are attributed to the AVT secondary water chemistry control which reduces the possibility of valve sticking when required to operate. This history of trouble-free performance provides added assurance of the dependability of these valves and the control systems. The proposed TS change will allow the closure tests to be waived only at end-of-cycle when boron concentration is less than 150 ppm. Based on expected boron letdown rates of at least 80 ppm/month, this allows no more than a two month extension. This change is similar to a TS change granted by Amendment No. 30 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant on May 7, 1979. The Prairie Island units have the same turbine valves and controls as those existing at the Kewaunee Nuclear Power Plant.

Based on the above, we consider the waiver of the governor and turbine stop valve closure tests at end-of-cycle when the boron concentration is less than 150 ppm to be acceptable.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of an accident previously evaluated, do not create the possibility of an accident of a type different from any evaluated previously, and do not involve a significant reduction in a margin of safety, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: September 8, 1982

Principal Contributor:

D. C. DiIanni