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June 24, 1988

Director of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Attn: Document Control Desk
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PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Additional Information Related to
License Amendment Request Dated September 28, 1987
Turbine Valve Test Frequency Reduction

The purpose of this letter is to provide additional information requested during a telephone conference between NRC staff members John Craig, Charles Nichols, Richard Emsht, and Dominic DiIanni and Ron Meyer of NSP. This information supplements Prairie Island license amendment request dated September 28, 1987, "Turbine Valve Test Frequency Reduction".

Turbine Valve Testing Experience

The turbine valves installed at Prairie Island plant are tested for proper operation (close on demand) on a monthly basis. In the life of the plant the turbine valves have undergone surveillance testing 112 times on Unit 1 and 104 times on Unit 2. In addition to valve testing during monthly surveillances, the valves have been cycled with subsequent verification of operation, 36 and 32 times respectively during unit cooldowns and 41 and 42 times respectively on unit trips. This gives a combined total of 367 turbine valve operations during 28 years of combined operation.

During this time, there have been two incidences of turbine valve failures.

- a) During a turbine valve surveillance test on Unit 1, a turbine stop valve bypass valve (SVBV) was found in the open position. The SVBV failed to reclose during the previous surveillance due to mechanical binding. This failure did not represent a threat to a

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turbine overspeed incident since the redundant control valve closed as designed during the subsequent test.

- b) During a turbine valve surveillance test on Unit 2, a reheat interceptor valve failed to close. Investigation found that the operating lever was found on the actuator. This failure did not represent a threat to a turbine overspeed incident since the redundant reheat stop valve closed as designed.

Performance of Turbine Overspeed Protection Systems

During the life of the Prairie Island units, there have been no incidents of unplanned turbine overspeed and no single turbine valve failures that could have led to a turbine overspeed condition.

Additional Discussion of Safety Impacts of Reduced Frequency Testing

A test of the turbine valves at the Prairie Island plant requires that unit power be dropped to 50 to 60%. This monthly reduction in power causes a number of reactor power distribution perturbations and system challenges which are undesirable:

- a. Reducing reactor power is typically accomplished by the addition of boron to the Reactor Coolant System (RCS) with the control rods being used primarily for Delta I control. Upon return to power, the added boron must be removed from the RCS. This results in large amounts of water which must be processed by plant systems and the generation of radioactive waste.
- b. The Prairie Island units were designed primarily for base load operation. Load following and load reductions increase the possibility of equipment malfunctions which may lead to reactor trips. Load reductions also result in additional wear and stress on components.
- c. Following a load reduction, it may take several days for the reactor power distribution to stabilize. During this period, actual total reactor power can remain constant, while the indicated reactor power, as measured by the Nuclear Instrumentation System (NIS), may be changing. This is the result of xenon changes associated with the power reduction.
- d. Recent fuel and reload designs have resulted in cores that are more sensitive to Delta I (power in the top of the core minus power in the bottom of the core) control. These cores can develop divergent xenon (Delta I) oscillations during the middle of core life. Although procedures exist to control and dampen these oscillations, they could result in reactor power reductions to remain within Technical Specification limits. Near the end of life these problems are magnified by the larger isothermal temperature

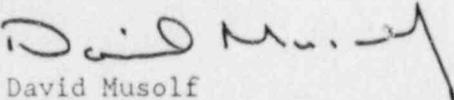
coefficient, lower boron concentration, and larger differential xenon transients.

Role of WCAP-11525 in the Licensing Process

WCAP-11525, "Probabilistic Evaluation of Reduction in Turbine Valve Test Frequency", serves as the manufacturers recommendation for turbine valve testing for the plants represented in the Westinghouse Owners Group - Turbine Valve Testing Frequency Subgroup. This analysis recommends a test interval of up to, but not exceeding one year for both Prairie Island units. Recommended testing intervals are to be re-evaluated following any turbine rotor modifications which are implemented the Prairie Island units.

Based on the above additional information and the analysis and recommendations presented in WCAP-11525, we feel that reduced turbine valve testing frequencies would enhance the safety and reliability of the Prairie Island units. Reducing the frequency of power reductions for testing would place less wear and stress on critical plant systems, reduce the quantities of contaminated reactor coolant and radioactive waste which must be processed and enhance operational safety.

Please contact us if you have any questions related to the information we have provided.


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