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SUBJECT: Provides addl info re review of submittal to delete plant TS 3/4.3.4 that concerns turbine overspeed protection requirements.

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June 29, 1995 AEP:NRC:1168B

Docket Nos.: 50-316

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Donald C. Cook Nuclear Plant Unit 2
TECHNICAL SPECIFICATIONS CHANGE REQUEST TO
DELETE TURBINE OVERSPEED PROTECTION REQUIREMENTS
ADDITIONAL INFORMATION

1. Donald C. Cook Nuclear Plant, Individual Plant Examination of External Events, submitted to the NRC in letter AEP:NRC:1082E, dated May 1, 1992.

2. "Review Insights on the Probabilities Risk Assessment for the Limerick Generating Station," NUREG-1068, 1984.

This letter is in response to the request for additional information as a result of the review of our submittal to delete Donald C. Cook Nuclear Plant unit 2 technical specification (T/S) 3/4.3.4, which concerns the turbine overspeed protection requirements. The additional information requested concerns the following specific issues: the turbine manufacturer's recommendation for maintenance and testing; the plant specific maintenance and test results for the associated valves; and the potential for missiles to affect safety-related equipment.

The Cook Nuclear Plant unit 2 turbine is equipped with several turbine valves, which control turbine speed and load during normal plant operations and protect it from overspeed during abnormal conditions. These valves are the high pressure turbine control valves and main stop valves, and the low pressure turbine reheat stop valves and reheat intercept valves. The turbine overspeed protection system consists of two independent mechanical sensing devices, which are capable of initiating fast closure of the

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turbine valves through two independent trip circuits. Each of these circuits are exercised weekly to verify their operability.

The proposed change to delete T/S 3/4.3.4 will not change the intention to test the turbine overspeed protection system at Cook Nuclear Plant. The surveillance for the turbine overspeed protection on unit 2 will be performed as a plant procedure as part of our Preventive Maintenance Program, outside of the T/Ss and in accord with operating experience at Cook Nuclear Plant, applicable industry experience, and consideration of the turbine manufacturer's recommendations. Changes to the plant procedure will receive a technical review in accord with T/S 6.5.3.1. This technical review will be conducted by an individual(s) qualified to ANSI N18.1-1971 and other than the individual(s) who prepared the procedure.

The turbine manufacturer's recommendation for maintenance and testing for the main stop valves and control valves has been followed.

Our maintenance and testing for the reheat stop and reheat intercept valves differs from the turbine manufacturer's recommendation. Our maintenance intervals are longer than the turbine manufacturer's recommendation. Our maintenance interval has been in accord with T/S 3/4.3.4.1.2 and as indicated below has proven sufficient to ensure the reliability of the turbine overspeed protection system.

Cook Nuclear Plant specific maintenance experience and test results of the main stop valves, control valves, reheat stop valves, and reheat intercept valves have been good. The unit 2 turbine is now operating in its tenth operating cycle with over 90,000 hours of operation. Turbine overspeed protection surveillance results have been satisfactory since unit startup in 1978. In 1983, a wear problem was found with the overspeed plungers. Replacement plungers were installed. Then in 1988 these plungers were replaced with parts having stellited (hardened) surfaces. There have been no subsequent problems.

As noted in our submittal 1168A, the Brown-Boveri low pressure turbine rotors are assembled from separate forgings that are welded together. They are not assembled using a shrunk-on disk design. The Brown-Boveri welded design is considered to be less susceptible to turbine burst. The UFSAR section 14.1.13 "Turbine-Generator Safety Analysis," deals with the safety analysis of the main turbine-generator and presents the results of our study of the consequences of a failure. This safety analysis has determined that the chance of a turbine overspeeding out of control to destruction is extremely small.

The requested change will not change the potential for turbine missiles to affect safety related equipment. The potential for turbine missiles is generally calculated as the product of three factors, the probability of missile generation, the probability of missile strike on a critical area, and the probability of penetration of the turbine missile through barriers into the critical area. The latter two factors are clearly not impacted by this change.

The probability of turbine missile generation is comprised of the probability of failure during normal operations and the probability of an overspeed failure. The Cook Nuclear Plant Individual Plant Examination of External Events (reference 1) examined the potential for turbine missile generation from normal operating conditions, and found the probability of turbine missile-induced core damage to be significantly less (better) than the individual plant safety objective of 10^{-7}/year (reference 2).

An analysis of the probability of failure of the turbine overspeed protection system has never been performed for the unit 2 Brown-Boveri turbine. As described above, the overspeed protection system is considered to be highly reliable. Removing the overspeed test from the T/Ss and performing the overspeed test with administrative controls will ensure that the potential for overspeed turbine missiles will not increase. Therefore, the requested change will not change the potential for turbine missiles to affect safety related equipment.

In summary, approval of the elimination of the T/S 3/4.3.4 is based upon:

1. turbine protection from excessive overspeed by two independent mechanical sensing devices, which are capable of initiating fast closure of the turbine valves through two independent trip circuits,

2. testing frequencies based on manufacturer's recommendations of every two weeks, at present,

3 maintenance inspection intervals for the main stop valves and the control valves in accordance with the OEM recommended intervals,

4. maintenance inspection intervals for the reheat stop and reheat intercept valves longer than the OEM recommendation but in accord with the successful maintenance intervals outlined in T/S 3/4.3.4,

5. the Brown-Boveri welded design is considered to be less susceptible to turbine burst, and

6. the potential for overspeed turbine missiles will not increase as a result of removing T/S 3/4.3.4.

In compliance with the requirements of 10 CFR 50.91(b)(1), copies of this letter and its attachments have been transmitted to the Michigan Public Service Commission and the Michigan Department of Public Health.

Sincerely,

EE Fitzpatrick

E. E. Fitzpatrick
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 29th DAY OF JUNE 1995

Notary Public

My Commission Expires: 3-9-96

plt

cc: A. A. Blind
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