# ATTACHMENT 1

Technical Specification 3/4.3.8
Turbine Overspeed Protection System
Mark-up for Susquehanna Units 1 & 2

9411160283 941111
PDR ADOCK 05000387
P PDR

INSTRUMENTATION

3/4.3.8 TURBINE OVERSPEED PROTECTION SYSTEM

LIMITING CONDITION FOR OPERATION

3.3.8 One turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: OPERATIONAL CONDITIONS 1 and 2.

ACTION:

With the above required turbine overspeed protection system inoperable, within 6 hours isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.3.8.1 The provisions of Specification 4.0.4 are not applicable.

4.3.8.2 The above required turbine overspeed protection system shall be demonstrated OPERABLE:

a. At least once per ~~7~~ 92 days by:

1. Cycling each of the following valves from the running position and observing valve closure:

a) Four high pressure turbine control valves,

b) Six low pressure turbine combined intermediate valves, and

c) Four high pressure turbine stop valves.

b. At least once per 18 months by performance of a CHANNEL CALIBRATION of the turbine overspeed protection instrumentation.

c. At least once per 40 months by disassembling at least one of each of the above valves and performing a visual and surface inspection of all valve seats, disks and stems and verifying no unacceptable flaws or corrosion.

INSTRUMENTATION

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3/4.3.8 TURBINE OVERSPEED PROTECTION SYSTEM

This specification is provided to ensure that the turbine overspeed protection system instrumentation and the turbine speed control valves are OPERABLE and will protect the turbine from excessive overspeed. Protection from turbine excessive overspeed is required since excessive overspeed of the turbine could generate potentially damaging missiles which could impact and damage safety related components, equipment or structures.

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3/4.3.9 FEEDWATER/MAIN TURBINE TRIP SYSTEM ACTUATION INSTRUMENTATION

The feedwater/main turbine trip system actuation instrumentation is provided to initiate action of the feedwater system/main turbine trip system in the event of failure of feedwater controller under maximum demand.

< UNIT 1 INSERT>

Technical Specification Amendment [#TBD, Date of Approval] extended the requirement for weekly steam valve surveillance testing to an interval not to exceed 92 days. The surveillance test involves the cycling of each of the Main Turbine Stop, Control, and Combined Intermediate Valves (Main Turbine Valves) from the running position and observing valve closure. General Electric recommended the extended surveillance test interval for Main Turbine Valves in TIL 969 Revision 1 (12/27/93). This test interval limits the probability of excessive overspeed, due to a Main Turbine Valve fail-to-close event, to the level accepted for missile generation and is within the predictive capabilities of the overspeed analysis.

The safety significance associated with the valve surveillance testing comes from the function of the Main Turbine Valves to close based on Electro-Hydraulic Control response to prevent an overspeed condition of the turbine. Turbine overspeed is a concern because of the potential that the overspeed condition may lead to turbine failure. Turbine failure may in turn lead to the generation of turbine missiles, with the potential to strike-and-damage safety-related structures, systems, and components.

Susquehanna replaced its original keyway turbine rotors with monoblock turbine rotors in 1986 (U1) and 1988 (U2) due to concerns over keyway cracking identified by the turbine vendor. The monoblock rotors installed at Susquehanna SES have an acceptably low probability of turbine missile damage to safety-related structures, systems, and components. The monoblock design eliminates the keyway crack initiation site, which is the area between the rotor and the turbine wheel that can fail and lead to turbine missiles. The change to the Main Turbine Valve surveillance frequency was based in part on the design integrity of the monoblock rotors installed at Susquehanna. Susquehanna maintains spare keyway designed rotors for potential use in either the Unit 1 or Unit 2 Low Pressure Turbine. The keyway designed rotors have been found to be susceptible to Stress Corrosion Cracking which can lead to turbine failure. Therefore, if any of the spare keyway design rotors are reinstalled into the Low Pressure Turbine, the turbine valve surveillance interval for Main Turbine Stop, Control, and Combined Intermediate Valves must be re-evaluated or revised to comply with the recommendations of TIL 969 Revision 0. This re-evaluation will be accomplished via the design change process associated with installing the spare rotors.

3/4.3.8 TURBINE OVERSPEED PROTECTION SYSTEM

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<INSERT> →

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The feedwater/main turbine trip system actuation instrumentation is provided to initiate action of the feedwater system/main turbine trip system in the event of failure of feedwater controller under maximum demand.

< UNIT 2 INSERT>

Technical Specification Amendment [#TBD, Date of Approval] extended the requirement for weekly steam valve surveillance testing to an interval not to exceed 92 days. The surveillance test involves the cycling of each of the Main Turbine Stop, Control, and Combined Intermediate Valves (Main Turbine Valves) from the running position and observing valve closure. General Electric recommended the extended surveillance test interval for Main Turbine Valves in TIL 969 Revision 1 (12/27/93). This test interval limits the probability of excessive overspeed, due to a Main Turbine Valve fail-to-close event, to the level accepted for missile generation and is within the predictive capabilities of the overspeed analysis.

The safety significance associated with the valve surveillance testing comes from the function of the Main Turbine Valves to close based on Electro-Hydraulic Control response to prevent an overspeed condition of the turbine. Turbine overspeed is a concern because of the potential that the overspeed condition may lead to turbine failure. Turbine failure may in turn lead to the generation of turbine missiles, with the potential to strike-and-damage safety-related structures, systems, and components.

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**ATTACHMENT 2**

General Electric
Technical Basis for Extending GE Turbine Valve Surveillance Intervals
NEDO-32155, GE Letter dated 9/30/94