PLANT SYSTEMS

TURBINE OVERSPEED

LIMITING CONDITION FOR OPERATION

3.7.1.7 At least one turbine overspeed protection system shall be OPERABLE.

APPLICABILITY: MODE 1, 2 and 3

ACTION:

With the above required turbine overspeed protection system inoperable, within 6 hours either restore the system to OPERABLE status or isolate the turbine from the steam supply.

SURVEILLANCE REQUIREMENTS

4.7.1.7.1 The provisions of Specification 4.0.4 are not applicable.

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

a. By cycling each of the following valves through at least one complete cycle from the running position and verifying movement of each of the valves through one complete cycle from the running position by direct observation:

1. Four Turbine Throttle valves at least once per 31 days,
2. Four Turbine Governor valves at least once per 31 days, *
3. Four Turbine Reheat Stop valves at least once per 18 months, and
4. Four Turbine Reheat Intercept valves at least once per 18 months.

b. At least once per 18 months, by performance of CHANNEL CALIBRATION on the turbine overspeed protection instruments.

c. At least once per 40 months **, by disassembly of 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. If unacceptable flaws or excessive corrosion are found, all other valves of that type shall be inspected unless the nature of the problem can be attributed to a service condition specific to that valve.

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* Testing of the turbine governor valves may be suspended during end-of-cycle power coastdown operation between 835 MWe and 386 MWe.

** For reheat stop and reheat intercept valves, the inspection cycle may be increased to a maximum of once per 60 months provided there is no indication of operational distress.

3/4.7.1.6 and 3/4.7.1.7 STEAM TURBINE and OVERSPEED PROTECTION

The turbine generator at the North Anna facility is arranged in a nonpeninsular orientation. Analysis has shown that this arrangement is such that if a turbine failure occurs as a result of destructive overspeed, potentially damaging missiles could impact the auxiliary building, containment, control room and other structures housing safety related equipment. The requirements of these two specifications provide additional assurance that the facility will not be operated with degraded valve performance and/or flawed turbine material which are the major contributors to turbine failures.

The turbine governor valves are required to be tested through one complete cycle from the running position. In normal operation, one or more governor valves may be less than fully open. Based upon the Westinghouse Technical Manual Operating Instructions, these valves are tested from the operating position to the full closed position and back to their pretest position. The deliberate opening of the last governor valve beyond its normal operating position would likely result in an unstable valve configuration. The purpose of the test is to verify that the governor valves will close from their normal operating position to the fully closed position.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values at 10°F and are sufficient to prevent brittle fracture.

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM – OPERATING

The component cooling water system normally operates continuously to remove heat from various plant components and to transfer the heat to the service water system. The system consists of four subsystems shared between units, with each subsystem containing one pump and one heat exchanger.

The current design basis for the component cooling water system is a fast cooldown of one unit while maintaining normal loads on the other unit. Three component cooling water subsystems need to be OPERABLE to accomplish this function. The fourth subsystem is a spare and may be out of service indefinitely. With only two component cooling water subsystems a slow cooldown on one unit while maintaining normal loads on the opposite unit can be accomplished.

The component cooling water system is designed to reduce the temperature of the reactor coolant system from 350°F to 140°F within 16 hours during plant cooldown, based on a service water temperature of 95°F and on having two component cooling water pumps and two heat exchangers in service for the unit being cooled down. Therefore, to ensure cooldown of one unit within 16 hours and maintain the other unit in normal full power operation three of the four subsystems must be OPERABLE.

Because subsystems are placed in standby by shutting down pumps and isolating heat exchangers and this system serves no accident mitigation functions, the subsystem is considered OPERABLE in the standby conditions since it can be easily placed in service quickly by manual operator actions.

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM – SHUTDOWN

The OPERABILITY of the component cooling water system when both units are in COLD SHUTDOWN or REFUELING ensures that an adequate heat sink is maintained for the residual heat removal system.

3/4.7.4.1 SERVICE WATER SYSTEM – OPERATING

The OPERABILITY of the service water system ensures that sufficient cooling capacity is available for safety related equipment during normal and accident conditions. The system is designed to meet the assumption of a single failure. During a design basis accident, both loops of service water cross-connect at the affected units recirculation spray heat exchangers to create a single large service water system. The affected units component cooling heat exchangers isolate so that sufficient flows are provided to both the non-affected and affected units components.

With four normal service water pumps OPERABLE, the unthrottled flow resistance of the system is such that greater than design flows are achieved if a single pump or power supply failure occurs following an accident. When three normal service water pumps are OPERABLE, the flow resistance of the system is adjusted to ensure that design flows are achieved if a single pump or power supply failure occurs following an accident. The required resistance is determined during periodic flow balance testing and is obtained by throttling flow through the component cooling water heat exchangers. Rather than marking and specifying exact component cooling water heat exchanger outlet throttle valve positions, operating procedures have been established to set system resistance at or greater than the required resistance. When only two normal service water pumps or a single loop are OPERABLE, the design basis function can still be met provided that the flow resistance of the system is adjusted and no additional failures occur. The allowed outage time of 72 hours is consistent with other LCOs for loss of one train of ESF systems, and is based upon an industry accepted practice considering the low probability of an accident occuring.

If more than two normal service water pumps or both service water loops are inoperable, the units are not prepared to respond to the design basis events for which the service water system is required. Both units must be placed in HOT SHUTDOWN within twelve hours and actions initiated within one hour thereafter to place the units in COLD SHUTDOWN. Twelve hours is a reasonable time based on operating experience to place the units in HOT SHUTDOWN from full power without challenging safety systems or operators. The units may remain in HOT SHUTDOWN until a method to further cool the units becomes available, but actions to develop the method must be started within one hour after reaching HOT SHUTDOWN.

Auxiliary service water pumps are strictly a backup subsystem and are not taken credit for in a design basis accident. However, these pumps are taken credit for in the 10 CFR 50, Appendix R, analysis. Therefore, these pumps are maintained OPERABLE in MODES 1, 2, 3, and 4 to meet these requirements.

PLANT SYSTEMS

TURBINE OVERSPEED

LIMITING CONDITION FOR OPERATION

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APPLICABILITY: MODE 1, 2 and 3

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ATTACHMENT 3

SIGNIFICANT HAZARDS CONSIDERATION

VIRGINIA ELECTRIC AND POWER COMPANY

SIGNIFICANT HAZARDS CONSIDERATION

The Technical Specifications (TS) surveillance requirements currently require testing and inspection of the Turbine Overspeed Protection System control valves to ensure their ability to prevent overspeeding of the turbine. The proposed changes will clarify the Bases and Surveillance Requirement wording to reflect the Virginia Electric and Power Company's current valve testing and verification of valve movement methodology for cycling the valves through at least one complete cycle. The proposed changes provide clarification to the testing and inspection requirements that each of the turbine control valves be cycled and movement verified through at least one complete cycle from the running position.

Clarification of the wording will also reflect the same wording in NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors" and Technical Specifications used by other utilities to demonstrate operability of the Turbine Overspeed Protection System.

Virginia Electric and Power Company has reviewed the proposed Technical Specification changes against the requirements of 10 CFR 50.92 and has determined that the proposed changes would not pose a significant hazards consideration. Specifically, operation of the North Anna Power Station in accordance with the proposed Technical Specifications changes will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   No new or unique accident precursors are introduced by these changes in surveillance requirements. The clarification for the turbine control valve testing and inspections do not change the design, operation, or failure modes of the valves and other components in the turbine overspeed protection system.

   The verification of the operability of the turbine control valves will continue to provide adequate assurance that the turbine overspeed protection system will operate as designed, if needed. Therefore, these changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previous evaluated.

Since the implementation of the proposed change to the surveillance requirements is to clarify the wording only, operation of the facilities with these proposed Technical Specifications does not create the possibility for any new or different kind of accident which has not already been evaluated in the Updated Final Safety Analysis Report (UFSAR).

The proposed wording changes to the Technical Specifications will not result in any physical alteration to any plant system, nor would there be a change in the method by which any safety-related system performs its function. The design and operation of the turbine overspeed protection and turbine control systems are not being changed. The proposed change merely represents a clarification to more specifically state current test requirements and test practice.

These changes do not change the design, operation, or failure modes of the valves and other components of the turbine overspeed protection system. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Involve a significant reduction in a margin of safety.

The proposed changes would not reduce the margin of safety as defined in the basis for any Technical Specifications. The design and operation of the turbine overspeed protection and turbine control systems are not being changed and the operability of the turbine control valves are being demonstrated in the same manner. In addition, the results of the accident analyses which are documented in the UFSAR continue to bound operation under the proposed changes, so that there is no safety margin reduction. Therefore, the proposed change does not involve a reduction in a margin of safety.