ATTACHMENT 2

To

Letter from C.R. Steinhardt (WPSC)

to

Document Control Desk (NRC)

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Proposed Amendment 120

Affected TS Pages

TS Section 3.4 and Basis

3.4 STEAM AND POWER CONVERSION SYSTEM

APPLICABILITY

Applies to the OPERATING status of the Steam and Power Conversion System.

OBJECTIVE

To assure minimum conditions of steam-relieving capacity and auxiliary feedwater supply necessary to assure the capability of removing decay heat from the reactor, and to limit the concentrations of water activity that might be released by steam relief to the atmosphere.

SPECIFICATION

a. Main Steam Safety Valves (MSSVs)

1. The Reactor Coolant System shall not be heated > 350°F unless a minimum of two MSSVs per steam generator are OPERABLE.

2. The reactor shall not be made critical unless five MSSVs per steam generator are OPERABLE.

3. If the conditions of TS 3.4.a.1 or TS 3.4.a.2 cannot be met within 48 hours, then within 1 hour initiate action to:

   - Achieve HOT STANDBY within 6 hours
   - Achieve HOT SHUTDOWN within the following 6 hours
   - Achieve and maintain the Reactor Coolant System temperature < 350°F within an additional 12 hours.

b. Auxiliary Feedwater System

1. The Reactor Coolant System shall not be heated > 350°F unless the conditions of TS 3.4.b.1.A and TS 3.4.b.1.B are met.

   A. Auxiliary feedwater train "A" and auxiliary feedwater train "B" are OPERABLE and capable of taking suction from the Service Water System and delivering flow to the associated steam generator.

   B. The turbine-driven auxiliary feedwater train is OPERABLE and capable of taking suction from the Service Water System and delivering flow to both steam generators, OR

      The turbine-driven auxiliary feedwater train is declared inoperable.

2. When the Reactor Coolant System temperature is > 350°F, any of the following conditions of inoperability may exist during the time interval specified:

   A. One auxiliary feedwater train may be inoperable for 72 hours.

   B. Two auxiliary feedwater trains may be inoperable for 4 hours.

   C. One steam supply to the turbine-driven auxiliary feedwater pump may be inoperable for 7 days.

3. If three auxiliary feedwater trains are discovered to be inoperable, initiate immediate action to restore one auxiliary feedwater train to OPERABLE status and suspend all LIMITING CONDITIONS FOR OPERATION requiring MODE changes until one auxiliary feedwater train is restored to OPERABLE status.

4. If the OPERABILITY requirements of TS 3.4.b.2 above are not met within the times specified, then within 1 hour action shall be initiated to:

   - Achieve HOT STANDBY within 6 hours
   - Achieve HOT SHUTDOWN within the following 6 hours
   - Achieve and maintain the Reactor Coolant System temperature < 350°F within an additional 12 hours.

5. When reactor power is < 15% of RATED POWER, the auxiliary feedwater pump control switches located in the control room may be placed in the "pull out" position and valves AFW-2A and AFW-2B may be in a throttled position without declaring the corresponding auxiliary feedwater train inoperable.

c. Condensate Storage Tank

1. The Reactor Coolant System shall not be heated > 350°F unless a minimum of 39,000 gallons of water is available in the condensate storage tanks.

2. If the Reactor Coolant System temperature is > 350°F and a minimum of 39,000 gallons of water is not available in the condensate storage tanks, reactor operation may continue for up to 48 hours.

3. If the time limit of TS 3.4.c.2 above cannot be met, within 1 hour initiate action to:

   - Achieve HOT STANDBY within 6 hours
   - Achieve HOT SHUTDOWN within the following 6 hours
   - Achieve and maintain the Reactor Coolant System temperature < 350°F within an additional 12 hours.

d. Secondary Activity Limits

1. The Reactor Coolant System shall not be heated > 350°F unless the Iodine-131 activity on the secondary side of the steam generators is ≤ 1.0 μCi/cc.

2. When the Reactor Coolant System temperature is > 350°F, the Iodine-131 activity on the secondary side of the steam generators may exceed 1.0 μCi/cc for up to 48 hours.

3. If the activity requirement of TS 3.4.d.2 cannot be met, then within 1 hour action shall be initiated to:

   - Achieve HOT STANDBY within 6 hours
   - Achieve HOT SHUTDOWN within the following 6 hours
   - Achieve and maintain the Reactor Coolant System temperature < 350°F within an additional 12 hours.

e. Turbine Overspeed Protection System

1. Reactor power shall not exceed 50% of RATED POWER unless two of the three turbine overspeed protection systems are OPERABLE, except as provided by TS 3.4.e.2.

2. If two or more of the turbine overspeed protection systems are inoperable, then maintain power < 50% of RATED POWER. When only two systems are OPERABLE, an individual system may be blocked for no longer than 4 hours to allow for testing.

BASIS

Main Steam Safety Valves (MSSVs)(TS 3.4.a)

The ten main steam safety valves (five per steam generator) have a total combined rated capability of 7,660,380 lbs./hr. at 118I lbs./in.^{2} pressure. The maximum full-power steam flow at 1721 MWt is 7,449,000 lbs./hr.; therefore, the main steam safety valves will be able to relieve the total maximum steam flow if necessary.

While the plant is in the HOT SHUTDOWN condition, at least two main steam safety valves per steam generator are required to be available to provide sufficient relief capacity to protect the system.

The OPERABILITY of the MSSVs is determined by periodic surveillance testing in accordance with the Inservice Testing Plan.

Auxiliary Feedwater System (AFW)(TS 3.4.b)

The Auxiliary Feedwater (AFW) System is designed to remove decay heat during plant startups, plant shutdowns, and under accident conditions. During plant startups and shutdowns the system is used in the transition between Residual Heat Removal (RHR) System decay heat removal and Main Feedwater System operation.

The AFW System is considered OPERABLE when the components and flow paths required to provide redundant AFW flow from the AFW pumps to the steam generators are OPERABLE. This requires that the two motor-driven AFW pumps be OPERABLE, each capable of taking suction from the Service Water System and supplying AFW to separate steam generators. The turbine-driven AFW pump is required to be OPERABLE with redundant steam supplies from each of two main steam lines upstream of the main steam isolation valves and shall be capable of taking suction from the Service Water System and supplying AFW to both of the steam generators. With no AFW trains OPERABLE, immediate action shall be taken to restore a train.

Auxiliary feedwater trains are defined as follows:

"A" train -	"A" motor-driven auxiliary feedwater pump and associated AFW valves and piping to "A" steam generator, not including AFW-10A or AFW-10B
"B" train -	"B" motor-driven auxiliary feedwater pump and associated AFW valves and piping to "B" steam generator, not including AFW-10A or AFW-10B
Turbine-driven train -	Turbine-driven AFW pump and associated AFW valves and piping to both "A" steam generator and "B" steam generator, including AFW-10A and AFW-10B

In the unlikely event of a loss of off-site electrical power to the plant, continued capability of decay heat removal would be assured by the availability of either the steam-driven AFW pump or one of the two motor-driven AFW pumps, and by steam discharge to the atmosphere through the main steam safety valves. Each motor-driven pump and turbine-driven AFW pump is normally aligned to both steam generators; valves AFW-10A and AFW-10B are normally open. However, as discussed in the following paragraphs, the position of valves AFW-10A and AFW-10B does not affect the OPERABILITY of the turbine-driven AFW pump or train. Any single AFW pump can supply sufficient feedwater for removal of decay heat from the reactor.

As the plant is cooled down, heated up, or operated in a low power condition, AFW flow will have to be adjusted to maintain an adequate water inventory in the steam generators. This can be accomplished by:

1. Throttling the discharge valves on the motor-driven AFW pumps, or

2. Closing one or both of the cross-connect flow valves, or

3. Stopping the pumps.

If the main feedwater pumps are not in operation at the time, valves AFW-2A and AFW-2B must be throttled or the control switches for the AFW pumps located in the control room will have to be placed in the "pull out" position to prevent their continued operation and overfill of the steam generators. Manual action to re-initiate flow after it has been isolated is considered acceptable based on analyses performed by WPSC and the Westinghouse Electric Corporation. These analyses conservatively assumed the plant was at 100% initial power and demonstrated that operators have at least 10 minutes to manually initiate AFW during any design basis accident with no steam generator dryout or core damage. The placing of the AFW control switches in the "pull out" position and the throttling of valves AFW-2A and AFW-2B are limited to situations when reactor power is < 15% of RATED POWER to provide further margin in the analysis.

During accident conditions, the AFW System provides three functions:

1. Prevents thermal cycling of the steam generator tubesheet upon loss of the main feedwater pump;

2. Removes residual heat from the Reactor Coolant System until the temperature drops below 300-350°F and the RHR System is capable of providing the necessary heat sink;

3. Maintains a head of water in the steam generator following a loss-of-coolant accident.

The feedwater flow rate required to prevent thermal cycling of the tubesheet, and for removing residual heat is the same, about 160 gpm for the reactor (or 80 gpm per steam generator). A 200-gpm flow to the steam generators is therefore sufficient to fulfill the above functions. Since the AFW System is a safety features system, an additional 200 gpm from the backup pump is provided. This redundant motor-driven capability is also supplemented by the turbine-driven pump capacity of 200 gpm.

The pumps are capable of automatic starting and can deliver full AFW flow within one minute after the signal for pump actuation. However, analyses from full power demonstrate that initiation of flow can be delayed for at least 10 minutes with no steam generator dryout or core damage. The head generated by the AFW pumps is sufficient to ensure that feedwater can be pumped into the steam generators when the safety valves are discharging and the supply source is at its lowest head.

Analyses by WPSC and the Westinghouse Electric Corporation show that AFW-2A and AFW-2B may be in the throttled position, or the AFW pump control switches located in the control room may be in the "pull out" position without a compromise to safety. This does not constitute a condition of inoperability as listed in TS 3.4.b.1, TS 3.4.b.2, or TS 3.4.b.3. The analysis shows that diverse automatic reactor trips insure a plant trip before any core damage or system overpressure occurs and that at least 10 minutes are available for the operators to manually initiate feedwater flow (start AFW pumps or fully open AFW-2A and AFW-2B) for any credible accident from an initial power of 100%. Furthermore, as described below, the OPERABILITY of the turbine-driven auxiliary feedwater train is independent of the position of valves AFW-10A and AFW-10B. However, the OPERABILITY of this train is dependent on the ability of these valves to reposition.

The OPERABILITY of the AFW System following a main steam line break (MSLB) was reviewed in our response to IE Bulletin 80-04. As a result of this review, requirements for the turbine-driven AFW pump were added to the Technical Specifications.

For all other design basis accidents, the two motor-driven AFW pumps supply sufficient redundancy to meet single failure criteria. In a main steam line break or main feed line break, it is assumed that the pump discharging to the intact steam generator fails and that the flow from the redundant motor-driven AFW pump is discharging out the break. Therefore, to meet single failure criteria the turbine-driven AFW pump was added to Technical Specifications.

The cross-connect valves (AFW-10A and AFW-10B) are normally maintained in the open position. This provides an added degree of redundancy above what is required for all accidents except for a MSLB. During a MSLB, one of the cross-connect valves will have to be repositioned regardless if the valves are normally opened or closed. Therefore, the position of the cross-connect valves does not affect the OPERABILITY of the turbine-driven AFW train. However, OPERABILITY of the train is dependent on the ability of the valves to reposition.

An AFW train is defined as the AFW system piping, valves and pumps directly associated with providing AFW from the AFW pumps to the steam generators. The action with three trains inoperable is to maintain the plant in an operating condition in which the AFW System is not needed for heat removal. When one train is restored, then the LIMITING CONDITIONS FOR OPERATION specified in TS 3.4.b.2 are applied. Should the plant shutdown be initiated with no AFW trains available, there would be no feedwater to the steam generators to cool the plant to 350°F when the RHR System could be placed into operation.

It is acceptable to exceed 350°F with an inoperable turbine-driven AFW train. However, OPERABILITY of the train must be demonstrated within 72 hours after exceeding 350°F or a plant shutdown must be initiated.

Condensate Storage Tank (CST)(TS 3.4.c)

The specified minimum water supply in the condensate storage tanks (CST) is sufficient for 4 hours of decay heat removal. The 4 hours are based on the Kewaunee site specific station blackout (loss of all AC power) coping duration requirement.

The shutdown sequence of TS 3.4.c.3 allows for a safe and orderly shutdown of the reactor plant if the specified limits cannot be met.

Secondary Activity Limits (TS 3.4.d)

The secondary coolant activity is based on a postulated release of the contents of one steam generator to the atmosphere. This could happen, for example, as a result of a steam break accident combined with the failure of a steam line isolation valve. The limiting dose for this case results from iodine-131 because of its low MPC, and because its long half-life relative to the other iodine isotopes results in its greater concentration in the liquid. The accident is assumed to occur at zero load when the steam generators contain maximum water. With allowance for plate-out retention in water droplets, one-tenth of the contained iodine is assumed released from the plant. The maximum inhalation dose at the site boundary is then as follows:

$$Dose\ (rem) = C \bullet V/10 \bullet B(t) \bullet X/Q \bullet DCF$$

where:

C = secondary coolant activity, 1.0 μCi/cc

V = water volume in one steam generator, 3,510 ft^3 = 99 m^3

$B(t)$ = breathing rate, 3.47 x 10^{-4} m^3/sec

$\frac{X}{Q}$ = 2.9 x 10^{-4} sec/m^3

DCF = 1.48 x 10^6 rem/Ci iodine-131 inhaled

The resultant dose is < 1.5 rem.

Turbine Overspeed Protection System (TS 3.4.e)

Turbine overspeed protection is provided to limit the possibility of turbine missiles. Overspeed protection is provided by three independent systems based on diverse operation principles. The three systems are the electro-hydraulic (E-H) system, the mechanical trip system, and the redundant overspeed trip system (ROST). The E-H and mechanical systems are single channel and operate on a one-out-of one trip logic; the ROST system is a three channel system, requiring two-out-of-three channels to trip.