PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 880011
VIRGIL C. SUMMER NUCLEAR STATION

LIST OF AFFECTED PAGES

Page

3/4 7-4

PLANT SYSTEMS

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator emergency feedwater pumps and flow paths shall be OPERABLE with:

a. Two motor-driven emergency feedwater pumps, each capable of being powered from separate emergency busses, and

b. One steam turbine driven emergency feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two emergency feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three emergency feedwater pumps inoperable, immediately initiate corrective action to restore at least one emergency feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each emergency feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying that each motor driven pump develops a discharge pressure of greater than or equal to ~~1350~~ 1600 psig at greater than or equal to 90 gpm flow.

2. Verifying that the steam turbine driven pump develops a discharge pressure of greater than or equal to 1330 psig at a flow of greater than or equal to 97 gpm when the secondary steam supply pressure is greater than 900 psig. The provisions of Specification 4.0.4 are not applicable.

3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

EMERGENCY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator emergency feedwater pumps and flow paths shall be OPERABLE with:

a. Two motor-driven emergency feedwater pumps, each capable of being powered from separate emergency busses, and

b. One steam turbine driven emergency feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one emergency feedwater pump inoperable, restore the required emergency feedwater pumps to OPERABLE status within 72 hours or be in at le t HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With two emergency feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With three emergency feedwater pumps inoperable, immediately initiate corrective action to restore at least one emergency feedwater pump to OPERABLE status as soon as possible.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each emergency feedwater pump shall be demonstrated OPERABLE:

a. At least once per 31 days by:

1. Verifying that each motor driven pump develops a discharge pressure greater than or equal to 1600 psig at greater than or equal to 90 gpm flow.

2. Verifying that the steam turbine driven pump develops a discharge pressure greater than or equal to 1330 p.ig at a flow greater than or equal to 97 gpm when the secondary steam supply pressure is greater than 900 psig. The provisions of Specification 4.0.4 are not applicable.

3. Verifying that each non-automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 880011
VIRGIL C. SUMMER NUCLEAR STATION

DESCRIPTION AND SAFETY EVALUATION

DESCRIPTION OF AMENDMENT REQUEST

SCE&G proposes to modify the VCSNS TS to revise TS 4.7.1.2, Surveillance Requirements for the Motor Driven Emergency Feedwater pumps. This change increases the minimum discharge pressure acceptance limit from 1350 psig to 1600 psig at a minimum flow ≥90 gpm. This change is supported by an EFW flow analysis, as well as analyses performed to account for EDG tolerances.

SAFETY EVALUATION

The design basis for the EFW system identifies three safety related functions. These functions may be affected by allowable EDG output voltage and frequency degradation. These functions are: providing EFW flow to two intact steam generators for cooling down the Reactor Coolant System (RCS), limiting the maximum EFW flow to a faulted steam generator (SG) to 1000 gpm for a time period not to exceed 30 minutes, and initiating EFW flow to two steam gererators within 60 seconds of a design basis event or a loss of main feedwater.

EFW FLOW TO INTACT STEAM GENERATORS

The design basis for the EFW system requires, as a minimum, that one motor driven EFW pump--considering a single failure of the redundant pump--be capable of providing a total flow of 380 GPM to two intact SGs at a SG pressure of 1211 psig.

Review of test data and calculations indicates that there is approximately a 6.8% head margin available at the minimum flow test pressure, relative to the certified pump performance curve, and no degradation of pump performance has occurred since initial operation of the pumps.

Allowable EDG voltage and frequency fluctuations could result in a flow change of ± 1.5% and a head change of ± 3.0%. Since the actual testing of the motor driven EFW pumps indicates a 6.8% margin available, this margin will bound the EDG operation at reduced frequency and voltage. Therefore, the motor driven EFW minimum surveillance design pressure must be increased in proportion to the changes in voltage and frequency.

LIMIT OF EFW FLOW

The main steam line break (MSLB) inside containment analysis assumes that the EFW control valve fails to isolate the flow to the faulted SG loop, resulting in a 1000 GPM flow rate to that SG. This flow rate, used as an assumption in the containment pressure/temperature response analysis, is of concern when assuming the EDGs are operating on the high side of their allowable tolerances, causing the EFW motor driven pump to deliver an increased flow rate.

The MSLB is assumed to occur at 102% power. The containment design pressure is 57 psig, the leak rate test pressure is 47.1 psig, and the maximum calculated pressure is 45.96 psig. The maximum calculated pressure is reached within the first 10 minutes of the MSLB accident as the faulted SG depressurizes, and the EFW is pumped into the faulted loop. Following the initial depressurization and resulting pressure peak, EFW is the main source of steam release into the containment. The containment pressure response due to the EFW flow is slightly lower than the initial pressure peak.

Application of the EDG positive tolerance to the maximum calculated EFW flow to the faulted steam generator increases this flow slightly. The positive tolerance of the EDG also increases the Containment Spray (CS) flow. The additional CS flow is capable of removing the additional energy from the increase in EFW flow. Therefore, the increase in CS flow will cool the additional EFW flow increase, keeping the containment response within the bounds of the existing analysis.

INITIATION OF EFW FLOW WITHIN SIXTY SECONDS

The required minimum EFW flow to the unaffected SGs must be delivered within 60 seconds. The as designed time limit for an undervoltage condition for the motor driven EFW pump is the longest time: 45.1 seconds. This time includes: undervoltage time delay, 3 seconds; EDG start, 10 seconds; engineered safety feature loading sequencer, 20.1 seconds; and pump at full speed, 12 seconds. The actual measured time is 30.4 seconds. The as designed time limit for an undervoltage condition for the turbine driven EFW pump is the longest time: 38 seconds. This time includes: undervoltage time delay, 3 seconds and stroke time for steam supply valve and pump at full speed, 35 seconds. The actual measured time is 15.25 seconds. Therefore, existing margins are adequate to cope with the negative EDG tolerances.

PROPOSED TECHNICAL SPECIFICATION CHANGE - TSP 880011
VIRGIL C. SUMMER NUCLEAR STATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DESCRIPTION OF AMENDMENT REQUEST

SCE&G proposes to modify the VCSNS TS to revise TS 4.7.1.2, Surveillance Requirements for the Motor Driven Emergency Feedwater pumps. This change increases the minimum discharge pressure acceptance limit from 1350 psig to 1600 psig at a minimum flow ≥90 gpm. This change is supported by an EFW flow analysis, as well as analyses performed to account for EDG tolerances.

BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION

SCE&G has evaluated the proposed TS change and has determined that it represents a no significant hazards consideration based on the criteria established in 10CFR50.92(c). Operation of VCSNS in accordance with the proposed action will not:

(1) Involve a significant increase in the probability or consequences of any accident previously evaluated. The proposed change increases the motor driven EFW pump minimum surveillance discharge pressure to ensure that the pumps are capable of delivering their design basis flow to two steam generators, accounting for recirculation flow and the effect of EDG tolerances on the pumps' performance. The proposed change will not cause the EFW system to operate outside its design or testing limits since the increased surveillance discharge pressure is lower than the head produced by the pumps in the as-built condition. No physical change to the plant is involved, and there is no decrease in the ability of any system or component to prevent or mitigate the consequences of any accident previously evaluated.

(2) Create the possibility of a new or different kind of accident from any previously evaluated. The proposed TS change increases the motor driven EFW pumps' minimum surveillance discharge pressure and does not involve any modification to the pumps, motor drivers, or the system. Therefore, there is no possibility of introducing a new accident initiator, a new type of failure, or a malfunction.

(3) Involve a significant reduction in a margin of safety. There is no reduction of any margin of safety associated with the proposed change. There is an increase in margin associated with the increase of the surveillance discharge pressure. The higher value of the surveillance discharge pressure reduces the potential degradation in pump performance that is permitted to occur without reaching the TS limit and provides assurance that degradation of pump performance, at or below the minimum recirculation flow, will be readily detected.