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SUBJECT: Application for proposed Amends 128 & 80 to Licenses NPF-14 NPF-22,respectively,extending allowable LCO for RHR.

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Director Of Nuclear Reactor Regulation
Attention: Dr. W.R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENTS 128 AND 80 TO
LICENSE NOS. NPF-14 AND NPF-22: CHANGES TO
THE SSES UNITS 1 & 2 TECHNICAL SPECIFICATIONS
TO TEMPORARILY EXTEND A THREE DAY LCO FOR
RHRSW/ESW MODIFICATIONS

Docket Nos. 50-387
and 50-388

PLA-3338 FILES A17-2, R41-2

Dear Dr. Butler:

The purpose of this letter is to transmit proposed changes to the Susquehanna SES Unit 1 and Unit 2 Technical Specifications that extend the allowable Limiting Condition for Operation (LCO) time frame for suppression pool spray and cooling modes of Residual Heat Removal (RHR), RHR Service Water (RHRSW) and Emergency Service Water (ESW) from 3 days to 7 days to allow for installation of an RHRSW/ESW modification. These are temporary Technical Specification changes effective only during installation of the RHRSW/ESW modifications.

BACKGROUND

We are requesting Specifications 3.6.2.2, Action a.; 3.6.2.3, Action a.; 3.7.1.1, Action a.1 and 3.7.1.2, Action a.3 - Unit 1 and Unit 2 - be temporarily modified to extend the allowable LCO timeframe from 3 days to 7 days. These changes allow for RHRSW and ESW modifications to take place without requiring a dual unit shutdown. These modifications, when completed, will result in increased decay heat removal availability, significant reduction of the likelihood of Station Blackout (SBO) because of the increased availability of Diesel Generator (DG) cooling, reduced time required to set up fire main water injection into the reactor vessel thereby reducing overall plant risk and restoration of the ESW system to its original design intent.

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DESCRIPTION OF CHANGE

PP&L is proposing that Specifications 3.6.2.2, Action a.; 3.6.2.3, Action a.; 3.7.1.1, Action a.1 and 3.7.1.2, Action a.3 - Unit 1 and Unit 2 - be temporarily modified to reflect the new LCO timeframes as indicated on the attached marked-up pages.

SAFETY ANALYSIS

PP&L has identified a problem at Susquehanna SES regarding the inspection and maintainability of the RHRSW/ESW systems. The following description details the scope and benefits of the modifications planned for RHRSW and ESW and explains system inter-relationships.

The RHRSW check valves on either side of the RHR Heat Exchanger (HX) allow it to be isolated. Presently these valves leak; therefore, the RHR HX cannot be isolated to allow HX inspection and maintenance. Because the check valves at the outlet of the RHR HX's in both SSES units leak, these valves are to be replaced by ball valves. Also, a butterfly valve is to be added at the inlet to the Unit #1 RHR Hx's. The Unit #2 RHR HX's are already supplied with two inlet valves and they perform satisfactorily. Besides the modifications mentioned above, drain lines are to be added to the RHRSW system and a 3" valve is to be installed at the outlet of each loop of the RHRSW system so that in the event of SBO the diesel driven fire pump injection to the Reactor Pressure Vessel (RPV) can be started within one hour rather than the three to four hours currently required. Also, the keepfill lines and their associated check valves are to be removed from the ESW piping. This last task is part of the ESW Upgrade project which requires changing position of the spray pond bypass valves from normally closed to normally open and adding new keepfill lines to the ESW system.

The proposed modifications have a number of long term benefits. First, the RHRSW HX can be isolated so that thorough HX inspection and cleaning can be completed. This capability will allow increased decay heat removal availability and significantly reduce the probability of common mode failure of the HX's as a result of material and/or chemistry problems. Second, the larger drain lines reduce drain times and therefore reduce the RHRSW outage duration. Third, the replacement of the fire main connection flange with a valve assembly reduces the time required to set up fire main water injection into the reactor vessel in the event of SBO, thereby reducing overall plant risk. Fourth, the ESW upgrade modification, to be completed during the RHRSW/ESW outage, restores the ESW system to its original design intent.

During these modifications only one loop of the RHRSW system and one loop of the ESW system will be inoperable at the same time. To perform these modifications one loop of the RHRSW and ESW system must be drained. Drainage of these systems takes about two days and it is expected to require another three to four days to perform the modifications; a total of seven days on each loop will be required to complete the modifications. These modifications are to be performed on each loop of the ESW and RHRSW systems, therefore two seven day LCO's are needed. However, modification on each loop is planned at different times. Modifications on Loop A of the ESW/RHRSW for both Units is presently scheduled for the Unit 1 5th refueling outage which is expected to start on September 8, 1990 and modifications on Loop B of the ESW/RHRSW is planned for the Unit 2 4th refueling outage which is expected to start on March 9, 1991.

It is important to consider how various systems will be affected by inoperability of one loop of the RHRSW and ESW system. The ESW system provides cooling to RHR pumps, RHR rooms, High Pressure Cooling Injection (HPCI) rooms, Reactor Core Isolation Cooling (RCIC) rooms, Core Spray (CS) rooms, Diesel Generators (DG's), Reactor Building Closed Cooling Water (RBCCW) system, Turbine Building Closed Cooling Water (TBCCW) system and the control structure chilled water system and Dx units which cool the emergency switchgear room unit coolers, in Unit 1 and 2, respectively.

The RHRSW system provides cooling to the RHR Heat Exchangers (HX's) which are used for removing heat in modes of Shutdown Cooling (SDC), Suppression Pool Cooling (SPC) and suppression pool spray. Also, in case of emergency, when makeup water has to be supplied from the spray pond, the RHRSW system is used to pump water to the vessel, or in case of Station Blackout (SBO), the diesel driven fire pump uses the RHRSW system path to inject to the vessel.

These modifications remove one common return line to the spray pond from service, hence, one loop of the ESW and one loop of the RHRSW system, will become inoperable.

Loss of one loop of ESW system prevents cooling of two RHR pumps, one division of room coolers for each of the two RHR rooms, one CS loop's room cooler, one channel of room unit cooler for HPCI and one channel of room unit cooler for RCIC. It also removes from operation one backup channel of the emergency switchgear room unit coolers and one backup channel of the TBCCW and RBCCW HX's coolers. And finally loss of one loop of ESW system affects DG cooling.

NO SIGNIFICANT HAZARDS CONSIDERATIONS

The proposed temporary changes do not:

(1) Involve an increase in the probability or consequences of an accident previously evaluated. The effect of increasing the Allowed Outage Time (AOT) from 3 days to 7 days on the plant response to a design basis event was considered. It was assumed that the planned 7 day outage of one ESW loop and one RHRSW loop fell within the AOT's for LCO's; therefore, no further single failures were required to be considered. It was also assumed that one unit is operating and the second unit is either in Condition 5 (refueling) or actually in the fuel movement process Condition *. Given that no further single failures need to be considered, the complement of equipment available for accident response was evaluated. For short term (less than 10 minutes) response to the postulated accident under the assumed conditions, the full complement of ECCS equipment is available because the ECCS pumps will operate for greater than ten minutes without motor or pump cooling, based on engineering studies. Therefore, the short term decay heat removal requirements are met for the accident unit. For long term (greater than 10 minutes) accident response, two RHR and all core spray pumps, are operable. The available RHRSW loop provides the required long term decay heat removal.

The accidents that were considered are the full range of loss of coolant accidents (LOCA's) with and without a concurrent Loss Of Offsite Power (LOOP). Since, the assumption of no further single failure was made, the LOOP and non-LOOP cases are equivalent because power to all eight ESS buses is assured in either case. In addition, the LOCA/false LOCA event did not need to be assessed for the RHRSW/ESW outage because the complicated series of failures required to produce a false LOCA signal was considered as a further single failure.

The requirements for long term accident response are: one ECCS pump (core spray or RHR) for level control and one decay heat removal loop, consisting of an RHR pump, an RHRSW pump and one RHR heat exchanger. Since one RHR pump in each of two loops, one decay heat removal loop and all core spray pumps are available for long term accident response, the long term decay heat removal requirements are also met for the accident unit.

For the unit in Condition 5 or *, long term decay heat removal is the only requirement. This requirement is easily accomplished using fuel pool cooling, provided that the water level requirements are met.

The ESW system does have other functions which apply to ECCS and post accident response systems such as cooling emergency switchgear rooms. One loop of ESW is sufficient to provide enough room cooling for the HPCI and RCIC rooms, by design. Therefore, cooling of these rooms is not of concern.

As a result of the above discussion, it is concluded that since the proposed RHRSW/ESW outage of 7 days is within the revised AOT for those systems, the plant design basis will not be compromised or violated and therefore, there is no increase in the probability or consequence of an accident previously evaluated.

(2) Create the possibility of a new or different kind of accident from any previously evaluated. As stated in Part (1), the accidents that were considered are the full range of LOCA's with and without a concurrent LOOP. A full complement of ECCS equipment was assumed available for the short term response and one loop of decay heat removal for long term response. Any postulated accident occurring during this modification is bounded by previous analysis.

(3) Involve a reduction in the margin of safety. The main concern with the RHRSW/ESW modification from a safety margin viewpoint is its affect on RHR capability for both injection to the vessel and decay heat removal. Also, loss of one loop of the ESW system affects the DG Cooling and SBO. We have completed an extensive study comparing the present and modification unavailabilities of RHR (SPC and decay heat removal modes) DG Cooling and present and modification risks of SBO to determine the affect of the proposed temporary 7 day LCO extension on the margin of safety. In our analysis, we have taken the following compensatory measures to offset RHRSW/ESW subsystem unavailability: the ESW spray pond bypass valve will be open, the ESW transfer valves at the DG's will be open, we plan no system unavailability due to planned maintenance or test, we will verify proper valve positions to diminish the possibility of valve misalignments, we take credit for the non-operating unit RHRSW pump and finally we take credit for RWCU as an alternate means of heat removal. It should be mentioned that as a conservative measure we take no credit in our analysis for use of the main condenser as a heat sink or RHRSW/ESW system recovery during the 7 day LCO.

Our study shows that the modification unavailability of the heat removal function of the SPC/SPS mode of the RHR system and RHRSW system increases. This increase in unavailability is due to the fact that during the modification, only one RHR pump and one RHR HX will be available for SPC. The Technical Specification, 3.6.2 states that with one loop of the RHR unavailable for SPC the AOT for the RHR system can be three days. However, since procedures are available for using the RWCU for decay heat removal from the vessel, we take credit for it to increase the AOT of the RHR system for SPC. Using the RWCU as an alternative for SPC, along with the precautionary measures outlined above, reduces the modification unavailability by 75.4%.

In addition to our analysis of the unavailability of the SPC mode of the RHR system, we considered the effect of ESW unavailability. The unavailability of DG cooling decreases during the modification by 71.9%. This is mainly due to the fact that the spray pond bypass valve will be opened with the ESW system in operation before the modification starts. Technical Specification 3/4.7.1.2 states that with one loop of the ESW system unavailable the ESW system can have a 3 day AOT. Verification of proper positioning of the valves in the ESW system and DG's contribute to this unavailability reduction, too.

In summary, our results indicate that during the modification the unavailability of any system that is affected by the RHRSW/ESW modification will decrease with all precautionary measures taken. During the modification, because of the fact that the spray pond bypass valves would be opened, because of verifying the desired position of certain valves as precautionary measures, and finally because of the availability of the RWCU system for decay heat removal, there is no reduction in the margin of safety. After installation of the RHRSW/ESW modifications the margin of safety will be improved.

We request these temporary amendments be approved by August 15, 1990.

If you have any questions regarding the above proposal, please direct them to Mr. J.B. Wesner at (215) 770-7911.

Very truly yours,

H Keiser

H. W. Keiser

Attachments

cc: NRC Document Control Desk (original)
NRC Region I
Mr. G. Scott Barber, NRC Sr. Resident Inspector
Mr. M. C. Thadani, NRC Project Manager