BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

Docket No. 50-387

PENNSYLVANIA POWER & :
LIGHT COMPANY

REVISED PROPOSED AMENDMENT No. 200
FACILITY OPERATING LICENSE NO. NPF-14
SUSQUEHANNA STEAM ELECTRIC STATION
UNIT NO. 1

Licensee, Pennsylvania Power & Light Company, hereby files proposed Amendment No. 200 to its Facility Operating License No. NPF-14 dated July 17, 1982.

This amendment contains a revision to the Susquehanna SES Unit 1 Technical Specifications.

PENNSYLVANIA POWER & LIGHT COMPANY
BY:

R. G. Byram
Sr. Vice President - Nuclear

Sworn to and subscribed before me
this 10th day of June, 1996.

Martha C. Sedora
Notary Public

Notarial Seal
Martha C. Sedora, Notary Public
Allentown, Lehigh County
My Commission Expires Jan. 15, 1998
Member, Pennsylvania Association of Notaries

BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

Docket No. 50-388

PENNSYLVANIA POWER & :
LIGHT COMPANY

REVISED PROPOSED AMENDMENT No. 158
FACILITY OPERATING LICENSE NO. NPF-22
SUSQUEHANNA STEAM ELECTRIC STATION
UNIT NO. 2

Licensee, Pennsylvania Power & Light Company, hereby files proposed Amendment No. 158 to its Facility Operating License No. NPF-22 dated March 23, 1984.

This amendment contains a revision to the Susquehanna SES Unit 2 Technical Specifications.

PENNSYLVANIA POWER & LIGHT COMPANY
BY:

R. G. Byram
Sr. Vice President - Nuclear

Sworn to and subscribed before me
this 10th day of June, 1996.

Martha C. Sedora
Notary Public

Notarial Seal
Martha C. Sedora, Notary Public
Allentown, Lehigh County
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SAFETY ASSESSMENT

RWCU PENETRATION ROOM STEAM LEAK DETECTION FUNCTION DIFFERENTIAL TEMPERATURE ALLOWABLE VALUES AND TRIP SETPOINTS

BACKGROUND

The purpose of this proposed change to the Susquehanna SES Technical Specifications is to change differential temperature Technical Specification Allowable Values and Trip Setpoints for the RWCU penetration room steam leak detection function.

A design basis analysis and setpoint review for steam leak detection systems were initiated as corrective actions in response to violations 387/88-15-01 and 388/88-18-01. In order to evaluate the existing setpoints for the RWCU Equipment Area temperature detectors, a calculation was prepared. The calculation used PP&L's COTTAP (Compartment Transient Temperature Analysis Program) computer code to predict the RWCU room temperature rise versus time caused by a 25 gpm leak for winter and summer conditions and RWCU process piping temperatures of 545 F and 440 F. This code has been previously used for Technical Specification changes regarding the steam leak detection system. The COTTAP calculation models the rooms as three areas. The RWCU penetration room is modeled as one area, the RWCU pump room as another area, and the RWCU heat exchanger room as the third area. All of the RWCU rooms have supply ducts, but the only exhaust duct is located in the RWCU penetration room. Therefore, transfer air from the RWCU pump and heat exchanger rooms is introduced into the RWCU penetration room, where it enters the exhaust vent.

The calculation assumes that the room air is completely mixed and produces a uniform temperature within the room (no thermal stratification). The calculation also assumes a large portion of the water which leaks does not flash to steam and flows to the floor and eventually to the drains. The original analysis (Amendment No. 123 to License NPF-14 and Amendment No. 90 to License NPF-22) neglected the energy addition to the room due to this liquid, thereby underpredicting the temperature response.

Spurious isolations associated with the RWCU penetration room differential temperature steam leak detection system, due to large day to night temperature changes which affected the supply air temperature have been documented. Work performed to support resolution of this concern included a revision to the analysis which calculates the RWCU penetration room temperature upon a 25 gpm coolant leak. In addition to this, RWCU room temperatures have been collected to ensure that the new calculated differential temperature setpoints will avoid spurious isolations.

The new analysis assumes that all the transfer air from the RWCU pump and RWCU heat exchanger rooms completely mixes in the RWCU penetration room. The exhaust duct is relatively high in the room, and will be removing the warmer air in the room. The cooler transfer air from the RWCU pump and heat exchanger rooms will remain low in the room and rise as it is heated, allowing it to come into equilibrium with the room. Therefore, the transfer air mixture assumption is justified.

In addition to this, the energy addition of the liquid portion of the leak to the RWCU penetration room is also modeled in the new analysis, which was not done in the original analysis (the RWCU pump and RWCU heat exchanger room temperature analysis does not model this energy). The liquid cooldown was previously ignored to limit the complexity of the COTTAP analysis. The additional energy increases the RWCU penetration room temperature response, and will provide a more accurate, yet conservative, calculation of actual room conditions.

As previously stated, the proposed change revises the differential temperature (TDSH-G33-1/2N602E/F) Technical Specification Allowable Values and Trip Setpoints for the RWCU penetration room steam leak detection function, to reflect the effect of the new analysis. The revised values will avoid spurious isolations created by supply air temperature variations. No changes to the ambient temperature detector setpoints will be made as a result of the new analysis.

The new Technical Specification values are based on the results of calculations which use the results of the COTTAP analysis.

SAFETY FUNCTIONS OF AFFECTED COMPONENTS

Differential temperature monitoring is one of the methods of detecting leaks in the RWCU system, along with low reactor water level, ambient room temperature, high suction flow, and high differential flow. Two high differential temperature switches are installed for each room. The leak detection system initiates isolation of the RWCU isolation valves on sensing high differential temperature between the HVAC room supply air (cold leg) and room air (hot leg). For the RWCU penetration room, the hot leg is the common room HVAC exhaust air.

The following are design basis requirements for the room and ventilation temperature detection portion of the Leak Detection System:

a. Leak detection temperature trip setpoints shall be selected to detect and isolate a leak that is normally less than 25 gpm and below the flow rate corresponding to the critical crack size for the system piping.

b. Leak detection isolation temperature trip setpoints shall be set high enough to avoid inadvertent isolation caused by normal temperature transients or abnormal transients caused by non-leak conditions (such as loss of ventilation).

c. Leak detection isolation temperature trip setpoints shall be set using worst-case conditions.

d. Leak detection isolation temperature trip setpoints shall be set to include allowance for instrument tolerance and instrument drift.

e. Leak detection isolation temperature trip setpoints shall be established such that the leak will be detected and isolated within a reasonable time (<24 hrs).

In addition to the above, the Technical Specifications lists the basis for the setpoints as:

"Leak detection temperature setpoints are selected to prevent a high energy line break by detecting and isolating leakage below the flow rate corresponding to critical crack size for the respective system piping. The setpoints are also set below fire suppression setpoints (HPCI and RCIC) and high enough to avoid inadvertent isolation caused by normal temperature transients or abnormal transients caused by non-leak conditions (such as loss of ventilation)".

POTENTIAL EFFECTS ON SAFETY

This proposal changes the Technical Specification high differential temperature Allowable Values and Trip Setpoints for the RWCU penetration room steam leak detection system to reflect the use of a more accurate, yet conservative, model in the RWCU penetration room temperature analysis. This action allows a change in the existing process setpoints within the Technical Specification limits, if needed, but the system design basis (25 gpm leak) will remain unchanged. No new release pathways are created and no cross-contamination potential is created. Therefore, the proposed change does not introduce any potential effects on safety functions.

NO SIGNIFICANT HAZARDS CONSIDERATIONS

RWCU PENETRATION ROOM STEAM LEAK DETECTION FUNCTION DIFFERENTIAL TEMPERATURE ALLOWABLE VALUES AND TRIP SETPOINTS

Pennsylvania Power & Light Company has evaluated the proposed Technical Specification change in accordance with the criteria specified by 10 CFR 50.92 and has determined that the proposed change does not involve a significant hazards consideration. The criteria and conclusions of our evaluation are presented below.

1. **The proposed change does not involve an increase in the probability of occurrence or the consequences of an accident or malfunction of equipment important to safety, as previously evaluated.**

   FSAR section 5.2.5.1.3 addresses the ambient and differential room ventilation temperature leakage detection. This section states:

   "...switch setpoints are based on the temperature rise resulting from a leak at system conditions corresponding to full reactor power. "

   NRC Safety Evaluation on the RWCU system steam leak detection system (related to Amendment Number 123 to License NPF-14 and Amendment Number 90 to License NPF-22) reviewed and found acceptable the PP&L criteria for calculating the leak detection setpoints for the RWCU system, which include:

   1. Setpoints are selected to detect and isolate a leak that is normally less than 25 gpm and below the flow rate corresponding for the critical crack size for the system piping.

   2. Setpoints are set high enough to avoid inadvertent isolation caused by normal temperature transients or abnormal transients caused by non-leak conditions (such as loss of ventilation).

   This NRC SER also stated that a leak rate of 25 gpm is less than those leak rates associated with the onset of unstable pipe ruptures. This fact is also shown in FSAR figure 5.2-10. This value of 25 gpm constitutes the design basis for the steam leak detection system.

   The mixing and liquid energy addition assumption changes in the analysis do not affect this design basis. The analysis calculates the resulting room temperature increase from a 25 gpm leak. In fact, the new assumptions provide a more accurate yet conservative prediction of room temperature increases. Therefore, operation of the system is improved.

The proposed change leads to higher calculated room temperatures to be used in the differential temperature setpoint calculations. The engineering study was reviewed to determine if the higher calculated temperatures would have a negative impact on the High Energy Line Break and Leak Analysis environmental study which provides the basis for equipment qualification.

In determining the room temperatures, the engineering study considers ambient temperature setpoints at which the leaks will be isolated. The proposed action will not change the ambient temperature setpoints, and actuation of these instruments will ensure that the results of the engineering study will not be adversely affected. Therefore, no impact on equipment qualification is being introduced by this change.

FSAR chapter 15 was reviewed for potential impacts on the accident analyses. The 25 gpm leak outside containment is not specifically analyzed in FSAR chapter 15. However, other conditions which result in coolant leakage outside containment are analyzed in section 15.6.2 (Instrument Line Break) and 15.6.4 (Steam System Piping Break Outside Containment). As stated in the NRC SER, the 25 gpm RWCU leak rate is bounded by the analysis in FSAR section 15.6.4. FSAR section 15.6.2 also states that leak detection actuations will initiate operator actions, a fact that is not affected by the proposed change. Therefore, based on a review of FSAR chapter 15 it was concluded that no impact on the analyzed accident scenarios is created by the proposed change.

Based on the above discussions, it is demonstrated that the proposed change will not adversely impact system function or equipment. System performance will actually be improved since the new setpoints eliminate spurious isolations resulting from a less accurate model. Therefore, the setpoint change has no impact on any equipment important to safety or any accidents previously analyzed in the FSAR.

2. **The Proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.**

   The proposed action does not create the possibility for an accident or malfunction of a different type than any evaluated previously in the FSAR. Neither the system design basis nor the system function will be adversely affected. System performance will be enhanced since spurious differential temperature actuations will be reduced as a result of using the more accurate, yet conservative, COTTAP model. In addition to this, redundant temperature isolation function will continue to be provided by the existing high ambient temperature detectors.

3. **The proposed change does not involve a significant reduction in a margin of safety.**

   The proposed action does not reduce the margin of safety as defined in the basis for any Technical Specification. The Technical Specification basis for the setpoints is to detect a leak below the flow rate corresponding to critical crack size for the system piping. As stated previously, the 25 gpm flow rate is an acceptable flow rate and is used to calculate the new temperatures.

Although the newly calculated RWCU penetration room temperatures will be higher (due to the improved model), the isolation actuation will be initiated by the high ambient temperature detectors before the penetration room temperatures reach the newly calculated values, as would happen under the old model. Therefore, system response is not adversely affected.

The current temperature values lead to differential temperature setpoints which are too low, causing spurious isolations. The use of the new temperature values will reduce the number of spurious isolations, reducing unnecessary challenges to safety systems during normal plant operations.

ENVIRONMENTAL CONSEQUENCES

An environmental assessment is not required for the proposed change because the requested change conforms to the criteria for actions eligible for categorical exclusion as specified in 10 CFR 51.22(c)(9). The requested change will have no impact on the environment. The proposed change does not involve a significant hazards consideration as discussed above. The proposed change does not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed change does not involve a significant increase in the individual or cumulative occupational radiation exposure.