BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

Docket No. 50-387

PENNSYLVANIA POWER & :
LIGHT COMPANY

PROPOSED AMENDMENT NO. 207
FACILITY OPERATING LICENSE NO. NPF-14
SUSQUEHANNA STEAM ELECTRIC STATION
UNIT NO. 1

Licensee, Pennsylvania Power & Light Company, hereby files proposed Amendment No. 207 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 27 of November 1996.

Notary Public

NOTARIAL SEAL
DIANE M. KOCH, Notary Public
Allentown, Lehigh County, PA
My Commission Expires July 12, 1999

BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

Docket No. 50-388

PENNSYLVANIA POWER & :
LIGHT COMPANY

PROPOSED AMENDMENT NO. 165
FACILITY OPERATING LICENSE NO. NPF-22
SUSQUEHANNA STEAM ELECTRIC STATION
UNIT NO. 2

Licensee, Pennsylvania Power & Light Company, hereby files proposed Amendment No. 165 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.

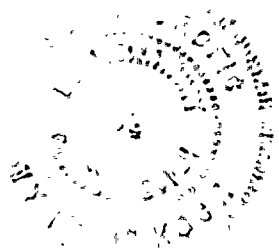
PENNSYLVANIA POWER & LIGHT COMPANY
BY:

R. G. Byram
Sr. Vice President - Nuclear

Sworn to and subscribed before me
this 27 of November 1996.

Diane M. Koch
Notary Public

NOTARIAL SEAL
DIANE M. KOCH, Notary Public
Allentown, Lehigh County, PA
My Commission Expires July 12, 1999



SAFETY ASSESSMENT

CHANGES TO ROD BLOCK MONITOR (RBM) SETPOINTS, CHANNEL CALIBRATION FREQUENCY, AND ALLOWED OUT-OF-SERVICE TIMES (AOT)

BACKGROUND

The RBM was originally designed to prevent fuel damage during a Rod Withdrawal Error (RWE) event while operating in the power range in a normal mode of operation. The RWE analyses originally assumed that the RBM automatically actuated to stop control rod motion. This automatic stop of control rod motion is the sole design basis of the RBM. The RBM is not considered to be a protection system and is not within the scope of IEEE 279-1971; the RBM does not initiate emergency core cooling, provide for emergency shutdown of the reactor, or prevent or mitigate offsite doses in excess of the guidelines of 10CFR100.

As a result of rod drift events at SSES, the RWE is currently analyzed without taking credit for the RBM to stop control rod motion. The results of these analyses are operating limits that prevent fuel damage from an RWE in which withdrawal of the highest worth rod to the full out position is not stopped by the RBM.

Additionally, PP&L proposed (PLA-4426, dated 2/29/96) to remove the RBM from Technical Specifications as a result of this plant specific analysis which established that the RBM no longer meets the Screening Criteria of 10CFR50.36(c)(2)(ii). That request was reviewed unfavorably, and resulted in this proposal to raise the RBM setpoints to reduce its operational impact being identified as a feasible alternative.

DESCRIPTION OF THE PROPOSED CHANGE

As stated, the RBM is no longer taken credit for in the current reload analyses resulting in this proposed request to change the High (Upscale) Rod Block setpoints. The new values for the RBM system setpoints have been calculated to support a 24 month operating cycle, resulting in the calibration frequency requirements as specified in Technical Specification Table 4.3.6-1 also proposed to be changed to "R" Refueling.

In addition, the results of the reload analyses indicate that the RBM function is not necessary to prevent fuel damage during an RWE and forms the basis for increasing the Allowed Out-of-Service Time (AOT) for the RBM to be consistent with its safety significance.

Thus, Tables 3.3.6-2 and 4.3.6-1 of Section 3/4.3.3, Sections 3/4.3.1.4.3 and 3/4.3.4.1.1.2, and Bases Section 3/4.1.4 of Unit 1 & Unit 2 Technical Specification Section are proposed to be changed (see attached marked-ups).

SAFETY ASSESSMENT

The proposed amendment changes the RBM high (upscale) setpoint for both two loop and single loop operation.

Proposed Values:

The current Nominal Trip Setpoints (NTSP) and Allowable Values (AV) for the RBM High (Upscale) rod block (RB) function as given in Table 3.3.6-2 [for two loop (2LO) operation] and section 3/4.3.4.1.1.2 [for single loop (SLO) operation] are:

Rod Block/Function	Current NTSP		Current AV	
	2LO	SLO	2LO	SLO
High (Upscale) RB	0.63W + 41 %	0.63W + 35 %	0.63W + 43 %	0.63W + 37 %

The proposed Nominal Trip Setpoints (NTSP) and Allowable Values (AV) for the RBM High (Upscale) rod block (RB) function are:

Rod Block/Function	Proposed NTSP		Proposed AV	
	2LO	SLO	2LO	SLO
High (Upscale) RB	0.58W + 52 %	0.58W + 47 %	0.58W + 55 %	0.58W + 50 %

As stated above, the new RBM system setpoints are calculated / evaluated to support a 24 month operating cycle, while providing the basis for changing the calibration frequency requirements (currently Quarterly for Unit 1 and Semi-Annually for Unit 2) as given in Technical Specification Table 4.3.6-1 to "R" Refueling.

For further reference, the NTSPs for the APRM rod block and scram are provided:

APRM Function	NTSP	
	2LO	SLO
Rod Block	0.58W + 49 %	0.58W + 44 %
Scram	0.58W + 58 %	0.58W + 53 %

Analysis

The RBM was originally designed to prevent fuel damage during a Rod Withdrawal Error (RWE) event while operating in the power range in a normal mode of operation. FSAR section 15.4.2 (Rod Withdrawal Error - At Power) originally took credit for the RBM automatically actuating to stop control rod motion and preventing fuel damage during an RWE event at power. However, current reload analyses do not take credit for the RBM system.

Reference 4 section 15.4.2 (Uncontrolled Control Rod Assembly Withdrawal at Power) states that General Design Criteria (GDC) 10, 20, and 25 apply to an RWE event. Reference 3 section 15.4.2 (Rod Withdrawal Error at Power) states that "the staff concludes that the requirements of General Design Criteria 10, 20, and 25 have been met" " without taking credit for the RBM function. These two documents indicate that the acceptance criteria for the RWE analyses is compliance with the GDCs.

To ensure that the proposed change does not impact continued compliance to GDCs 10, 20, and 25, an evaluation was performed using the results from References 1 and 2.

GDC 10 requires that the specified acceptable fuel design limits (SAFDLs) are not exceeded for the anticipated transient, in this case the RWE. Reference 4 section 15.4.2 states that the applicable SAFDLs for the RWE are:

a) The MCPR Safety Limit as specified in Section 4.4 of that same reference is not violated

b) Uniform cladding strain as specified in Section 4.2 of that same reference does not exceed 1%

The RWE analyses are performed on a unit / cycle specific basis using NRC approved methods (Reference 5). The results of the Unit 1 and 2 analyses (as given in References 1 and 2), without taking credit for the RBM, determine a MCPR Operating Limit such that the reduction of MCPR margin due to an RWE does not violate the MCPR Safety Limit. The results also validate that maximum uniform cladding strain is less than 1%. Therefore, the applicable SAFDLs for the RWE are satisfied, and GDC 10 requirements are met when no credit is taken for the RBM.

GDC 20 requires that the protection system is automatically actuated to prevent exceeding the SAFDLs. The RWE analyses, without taking credit for the RBM, conservatively determine a MCPR Operating Limit and validate that maximum uniform cladding strain is less than 1%. Therefore, actuation of the RBM is not necessary to prevent exceeding the applicable SAFDLs for the RWE, and the GDC 20 requirement is met when no credit is taken for the RBM.

The results presented for GDC 10 and 20 are for analyses in which no credit is taken for the RBM. In essence, the assumption is that the RBM system does not perform its design function. The proposed increase of the RBM setpoints is conservative with respect to the analyses presented, since the RBM function continues to be available. Therefore, the proposed change is justified based on the RWE analyses.

GDC 25 requires that the reactor protection system is designed such that single malfunctions in the reactivity control system will not cause SAFDLs to be exceeded. The RWE analyses assume drift of the highest worth rod to the full out position without taking credit for the RBM. The results of these analyses determine a MCPR Operating Limit such that the reduction of MCPR margin due to an RWE does not violate the MCPR Safety Limit, and validate that maximum uniform cladding strain is less than 1%. Therefore, credit for the RBM need not be taken to meet the requirements of GDC 25.

The assumption in the RWE analyses of a control rod drift event and no actuation of the RBM is more conservative than the single failure assumptions in Reference 3. The proposed increase of the RBM setpoints is conservative with respect to the analyses presented, since the RBM function continues to be available. In addition to this, the APRM scram setpoint is not being affected by the change and will continue its current protection level by providing a scram signal to the RPS.

Based on the above discussions, continued compliance to GDCs 10, 20, and 25 is maintained for the increase in RBM setpoints, since this action is conservative with respect to the assumptions in the reload analyses.

The proposed change also provides several operational benefits by increasing the available core "flow window". The increased flow window allows for an increased use of flow to compensate for reactivity changes leading to fewer control rod pattern adjustments, and a reduction of nuisance alarms. In addition to this, the proposed change would reduce operator interaction with the system (reducing possible man to machine interface problems) with no change to the restricted or operating regions in the power-flow map.

The new RBM setpoints have been chosen with sufficient margin to account for instrument accuracy, calibration accuracy, and drift. This will ensure that the new RBM values do not exceed the APRM scram setpoint. In addition to this, the RBM permissive setpoints will continue to provide their alarm function, alerting operators to the approach to the APRM rod block and scram setpoint values.

The RBM channel calibration frequency, as given in Technical Specification Table 4.3.6-1, is being changed from Quarterly for Unit 1 and Semi-Annually for Unit 2 to Refueling for both Units. This is justified since the new setpoints have been determined using a calculated

30 month drift (24 months plus 25% grace). This ensures the new setpoints account for any additional drift which occurs as a result of the calibration frequency change.

Technical Specifications section 3/4.3.1.4.3.a states that the AOT for restoring an inoperable RBM channel is 24 hours. Section 3/4.3.1.4.3.b further states that with two RBM channels inoperative, one channel is to be placed in the tripped condition within one hour. Since the reload analyses no longer take credit for the RBM and their results clearly show that the RBM is not required to prevent fuel damage. Then, the AOT given in sections 3/4.3.1.4.3 a and b are considered overly restrictive based on the RBM system's lack of safety impact. To provide plant personnel additional time to adequately address any problems with the RBM system, the AOTs are changed from 24 hours to 7 days and from one hour to 48 hours.

The slope of the new RBM setpoint lines is being changed to be equal to that of the APRM setpoint lines (0.58). The new slope will provide a consistent delta between lines (RBM and APRM) at all flows.

Conclusion

The proposed change does not change any of the hardware or function of the RBM. The new RBM setpoints have been chosen with sufficient margin to account for instrument accuracy, calibration accuracy, and drift. This will ensure that the new RBM values do not exceed the APRM scram setpoint .

The APRM rod block lines, stability regions, and rated core thermal power, which define the operating region in the power-flow map, remain at their current values. Therefore, the stability and operating regions in the power-flow map will remain unaffected. In addition to this, the RBM permissive setpoints will continue to provide their alarm function, alerting operators of the approach to the APRM rod block and scram setpoint values.

REFERENCES

1. PL-NF-96-005, Rev. 0, "Susquehanna SES Unit 1 Cycle 10 Reload Summary Report", August 1996

2. PL-NF-95-007, Rev. 2, "Susquehanna SES Unit 2 Cycle 8 Reload Summary Report", August 1996

3. NUREG-0776, "Safety Evaluation Report Related to the Operation of Susquehanna Steam Electric Station, Units 1 and 2 Docket Nos. 50-387 and 50-388", April 1981

4. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants", June 1987

5. PL-NF-90-001-A, "Application of Reactor Analysis Methods for BWR Design and Analysis" and Supplements 1-A and 2-A.

6. EC-078-0509, "Unit 1 RBM A and B Flow Biased Setpoint Change", rev. 2

7. EC-078-0503, "Unit 2 RBM A and B Flow Biased Setpoint Change", rev. 2

NO SIGNIFICANT HAZARDS CONSIDERATIONS

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 a significant increase in the probability or consequences of an accident as previously evaluated.**

   The RBM was originally designed to prevent fuel damage during a Rod Withdrawal Error (RWE) event while operating in the power range in a normal mode of operation. FSAR section 15.4.2 (Rod Withdrawal Error - At Power) originally took credit for the RBM automatically actuating to stop control rod motion and preventing fuel damage during an RWE event at power. However, current reload analyses do not take credit for the RBM system.

   Standard Review Plan (NUREG-0800) section 15.4.2 (Uncontrolled Control Rod Assembly Withdrawal at Power) states that General Design Criteria (GDC) 10, 20, and 25 apply to an RWE event. Susquehanna SES Safety Evaluation (NUREG-0776) section 15.4.2 (Rod Withdrawal Error at Power) states that "the staff concludes that the requirements of General Design Criteria 10, 20, and 25 have been met". These two documents indicate that the acceptance criteria for the RWE analyses is compliance with the GDCs.

   A review of the GDC and the reload analyses results was performed, which concluded that continued compliance to GDCs 10, 20, and 25 is maintained for the increase in RBM setpoints. The proposed change also provides several operational benefits by increasing the available core "flow window". The increased flow window allows for an increased use of flow to compensate for reactivity changes leading to fewer control rod pattern adjustments, and a reduction of nuisance alarms. In addition to this, the proposed change would reduce operator interaction with the system (reducing possible man to machine interface problems) with no change to the restricted or operating regions in the power-flow map.

   The reload analyses no longer take credit for the RBM and their results clearly show that the RBM is not required to prevent fuel damage. Therefore, the Allowed Out-of Service Times (AOTs) given in sections 3/4.3.1.4.3 a and b are considered overly restrictive based on the RBM system's lack of safety impact. To provide plant personnel additional time to adequately address any problems with the RBM system, the AOTs are changed from 24 hours to 7 days and from one hour to 48 hours.

The slope of the new RBM setpoint lines is being changed to be equal to that of the APRM setpoint lines (0.58). The new slope will provide a consistent delta between lines (RBM and APRM) at all flows.

Technical Specifications Bases section 3/4.3.4.1 states that the High (Upscale) Rod Block setpoint for single loop operation is to be "adjusted by an 8.5% decrease in recirculation drive flow to account for the active loop drive flow that bypasses the core and goes up through the inactive loop jet pumps". The proposed High (Upscale) Rod Block single loop operation setpoint has a 5% margin [(8.5%)(0.58)] from the two loop setpoint, which accounts for the flow decrease as stated in the Technical Specification Bases.

Based on the above discussion, the proposed action does not involve a significant increase in the probability or consequences of an accident as previously evaluated.

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

Chapters 7 and 15 of the FSAR were reviewed to determine if the proposed action has the potential of creating a postulated initiating event which is different than the analyzed anticipated operational transients or postulated design basis accidents addressed does not create the possibility of a new or different kind of accident previously evaluated.

The RWE analyses assumptions which have been approved by the NRC are documented in PP&L's approved methodology (PL-NF-90-001-A, Supplements 1-A and 2-A), and a conservative RBM response is assumed for the RWE analyses. The current RWE analyses assume that the RBM does not actuate to provide a control rod block. The proposed change in the RBM setpoints is conservative with respect to this assumption. Therefore, the proposed RBM setpoints do not change the assumptions used in the RWE analyses.

The new RBM setpoints have been chosen with sufficient margin to account for instrument accuracy, calibration accuracy, and drift. This will ensure that the new RBM values do not exceed the APRM scram setpoint . In addition to this, the RBM permissive setpoints will continue to provide their alarm function, alerting operators to the approach to the APRM rod block and scram setpoint values.

The RBM channel calibration frequency, as given in Technical Specification Table 4.3.6-1, is being changed from Quarterly for Unit 1 and Semi-Annually for Unit 2 to Refueling for both Units. This is justified since the new setpoints have been determined using a calculated 30 month drift (24 months plus 25% grace). This ensures the new setpoints account for any additional drift which occurs as a result of the calibration frequency change and that the Allowable Values for the affected functions will not be exceeded. Therefore, extending its calibration frequency to Refueling is acceptable.

Finally, the proposed change will not affect the operating region of the power-flow map (Unit 1 or Unit 2), since this region is defined by the APRM rod block line, stability regions, and not exceeding rated thermal power. The proposed change will not affect or change the APRM rod block and scram lines.

Based on the above discussion, changing the RBM setpoints and channel calibration frequency as proposed does not create a possibility of a new or different kind of accident from any accident previously evaluated.

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

The RWE analyses, without taking credit for the RBM, determine fuel operating limits which prevent the fuel from exceeding the applicable specified acceptable fuel design limits (SAFDLs), which are (for an RWE):

a) The MCPR Safety Limit as specified in Technical Specification 3.2.3 is not violated

b) Uniform cladding strain, as specified by the Linear Heat Generation Rate in Technical Specification 3.2.2, does not exceed 1%

Increasing the RBM setpoints provides several operational benefits by increasing the available core "flow window". The increased flow window allows for an increased use of flow to compensate for reactivity changes leading to fewer control rod pattern adjustments, and a reduction in nuisance alarms. In addition to this, the proposed change would reduce operator interaction with the system, reducing possible man to machine interface problems.

The proposed change does not change any of the hardware or function of the RBM. The new RBM setpoints have been chosen with sufficient margin to account for instrument accuracy, calibration accuracy, and drift. This will ensure that the new RBM values do not exceed the APRM scram setpoint .

The APRM rod block lines, stability regions, and rated core thermal power, which define the operating region in the power-flow map, remain at their current values. Therefore, the stability and operating regions in the power-flow map will remain unaffected.

In addition to this, the RBM permissive setpoints will continue to provide their alarm function, alerting operators of the approach to the APRM rod block and scram setpoint values. Therefore, increasing the RBM setpoints does not decrease the margin of safety as defined in the Technical Specifications.

The slope of the new RBM setpoint lines is being changed to be equal to that of the APRM setpoint lines (0.58). The new slope will provide a consistent delta between lines (RBM and APRM) at all flows.

Extension of the calibration frequency given in Technical Specification Table 4.3.6-1 (Quarterly for Unit 1 and Semi-Annually for Unit 2) to Refueling for both Units has no adverse effect on the current margin of safety. The new setpoints have been determined using a calculated 30 month drift (24 months plus 25% grace) which accounts for any additional instrument drift resulting from the calibration interval extension. This provides assurance that the Allowable Values for the affected functions will not be exceeded. Therefore, extending its calibration frequency to Refueling is acceptable.

Extending the AOTs in sections 3/4.3.1.4.3 a and b does not impact the safety margin. The reload analyses no longer take credit for the RBM and their results clearly show that the RBM is not required to prevent fuel damage. Therefore, the current AOTs are overly restrictive based on the RBM system's lack of safety impact and it is acceptable to increase them to the proposed values.

Technical Specifications Bases section 3/4.3.4.1 states that the High (Upscale) Rod Block setpoint for single loop operation is to be "adjusted by an 8.5% decrease in recirculation drive flow to account for the active loop drive flow that bypasses the core and goes up through the inactive loop jet pumps". The proposed High (Upscale) Rod Block single loop operation setpoint has a 5% margin [(8.5%)(0.58)] from the two loop setpoint, which accounts for the flow decrease as stated in the Technical Specification Bases.

Technical Specifications Bases section 3/4.1.4 (Control Rod Program Controls) discusses the RBM and its design function of preventing fuel damage. This section is proposed to be changed to reflect that, based on the RWE analyses, the RBM function is not necessary to prevent fuel damage. However, as previously discussed, the change will not reduce the margin of safety as defined in this Bases section.

Based on the above discussion, changing the RBM setpoints, channel calibration frequency, and AOTs as proposed does not involve a significant reduction in a margin of safety.

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.