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KEISER,H.W. Pennsylvania Power & Light Co. See Subj. files for ANP-88-168 & ANP-88-169
RECIP.NAME RECIPIENT AFFILIATION
BUTLER,W.R. Project Directorate I-2 and See Reports

SUBJECT: Forwards proposed Amend 119 to License NPF-14,supporting facility Cycle 5 reload.

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FEB 0 2 1989

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 AMENDMENT 119 TO LICENSE
NO. NPF-14: UNIT 1 CYCLE 5 RELOAD
PLA-3141 FILES R41-2/A17-2/A7-8C Docket No. 50-387

Dear Dr. Butler:

The purpose of this letter is to propose changes to the Susquehanna SES Unit 1 Technical Specifications in support of the ensuing Cycle 5 reload. Changes to the following Technical Specifications are requested:

Index

2.2.1	Reactor Protection System Instrumentation Setpoints
B 2.1	Safety Limits
3/4.2.1	Average Planar Linear Heat Generation Rate
3/4.2.2	APRM Setpoints
3/4.2.3	Minimum Critical Power Ratio
3/4.2.4	Linear Heat Generation Rate
3/4.3.6	Control Rod Block Instrumentation
3/4.4.1	Recirculation System
B 3/4.2.1	Average Planar Linear Heat Generation Rate
B 3/4.2.2	APRM Setpoints
B 3/4.2.3	Minimum Critical Power Ratio
B 3/4.4.1	Recirculation System

The following attachments to this letter are provided to illustrate and technically support each of the changes:

- Marked-up Technical Specification Changes
- No Significant Hazards Considerations
- PL-NF-89-001, "Susquehanna SES Unit 1 Cycle 5 Reload Summary Report," January 1989
- Susquehanna SES Unit 1 Cycle 5 Proposed Startup Physics Tests Summary Description, January 1989

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- o ANF-88-168, "Susquehanna Unit1 Cycle 5 Plant Transient Analysis," January 1989
- o ANF-88-169, "Susquehanna Unit 1 Cycle 5 Reload Analysis Design and Safety Analyses," January 1989

A proprietary ANF letter report, RAC:058:88, is being sent to you under separate cover in accordance with 10CFR2.790.

The marked-up proposed Technical Specification changes included do not contain revisions to the Recirculation System specifications regarding stability. PP&L currently plans to address any Technical Specification changes related to stability in a supplemental submittal. This submittal is discussed in greater detail in the Reload Summary Report, and is planned for submittal to the NRC by March 1, 1989.

Susquehanna SES Unit 1 is currently scheduled to be shutdown for refueling and inspection on April 1, 1989, and to restart as early as June 2, 1989. We request that your approval be conditioned to become effective upon startup after this outage, and we will keep you informed of any schedule changes.

Any questions with respect to this proposed amendment should be directed to Mr. R. Sgarro at (215) 770-7916.

Very truly yours,

H. W. Keiser

Attachments

cc: NRC Document Control Desk (original)
NRC Region I
Mr. M.C. Thadani, NRC Project Manager-Rockville
Mr. F.I. Young, NRC Sr. Resident Inspector-SSES
Mr. T.M. Gerusky, Pennsylvania DER

SUSQUEHANNA SES UNIT 1 CYCLE 5

PROPOSED STARTUP PHYSICS TESTS SUMMARY DESCRIPTION

January 1989

PENNSYLVANIA POWER & LIGHT COMPANY

PP&L

SUSQUEHANNA SES UNIT 1 CYCLE 5

PROPOSED STARTUP PHYSICS TESTS
SUMMARY DESCRIPTION

Susquehanna SES Unit 1 is planned to be shut down for its fourth refueling and inspection outage on April 1, 1989. During startup and initial cycle 5 operation, PP&L plans to perform a series of startup tests to assure that the reload core conforms to the design. A list of these proposed tests along with a brief description for each is provided below.

1) Core Loading Verification

Purpose: To assure the core is correctly loaded per design.

Description: The core will be visually checked to verify correct loading. An underwater video camera or suitable device will be used to record fuel assembly serial numbers, orientations, core locations, and proper core plate seating. A review of the videotape will be performed and will serve as an independent verification of the core loading. Any discrepancies discovered will be promptly corrected and the affected areas reverified prior to Unit 1 Cycle 5 startup.

2) POWERPLEX Input Deck Validation

Purpose: To ensure the POWERPLEX Core Monitoring System input deck is updated correctly before the start of every new fuel cycle.

Description: This validation will ensure that POWERPLEX, the ANF software system designed to perform in-core monitoring of BWR cores, is correctly updated for monitoring U1C5 operation. Core monitoring calculations within POWERPLEX are performed by XTGBWR, a three-dimensional reactor simulator code. The POWERPLEX input deck consists of all constants needed for the execution of this code and subsequent calculation of the margin to thermal limits. These constants must be updated to reflect the new core loading prior to the start of every new reload operating cycle in order to ensure satisfactory core monitoring. The deck is updated by ANF and verified jointly by members of the PP&L Reactor Engineering group located at Susquehanna SES and the Nuclear Fuels Engineering group located at the corporate headquarters.

3) Control Rod Functional (Insert and Withdrawal Checks)

Purpose: To assure proper control rod function.

Description: A control rod functional test, which includes mobility and overtravel checks, will be performed on each control cell loaded in its final configuration. Core subcriticality will be demonstrated and documented as each control rod is functionally tested.

4) Subcritical Shutdown Margin Demonstration

Purpose: To assure that at least the minimum required Shutdown Margin exists with the analytically determined strongest worth control rod fully withdrawn.

Description: This test will verify that at least the required amount of Shutdown Margin is maintained without determining the actual amount of SDM in the core. The analytically determined strongest worth control rod (or its symmetric counterpart) is fully withdrawn. Diagonally adjacent control rods are then slowly notched out (one at a time) and sub-criticality verified at each step, until the analytically determined reactivity worth of the diagonally adjacent control rods at their respective notch position just equals or slightly exceeds the required amount of Shutdown Margin. Verification at this step that the core is still subcritical demonstrates that at least the required amount of Shutdown Margin exists.

5) In-Sequence Critical and Shutdown Margin Determination

Purpose: a) To determine the actual amount of Shutdown Margin.

b) To compare predicted versus actual critical control rod positions.

Description: This test will be performed as part of the normal startup. Control rods are pulled in group order in their normal sequence until criticality is achieved. Taking into account the period and moderator temperature coefficient corrections, the Shutdown Margin is determined by calculation. In addition, to assure that there is no reactivity anomaly, the actual critical control rod position is verified to be within 1% $\Delta k/k$ of the predicted critical control rod position.

6) Control Rod Scram Time Testing

Purpose: To demonstrate the maximum scram insertion times of all rods following core alternations.

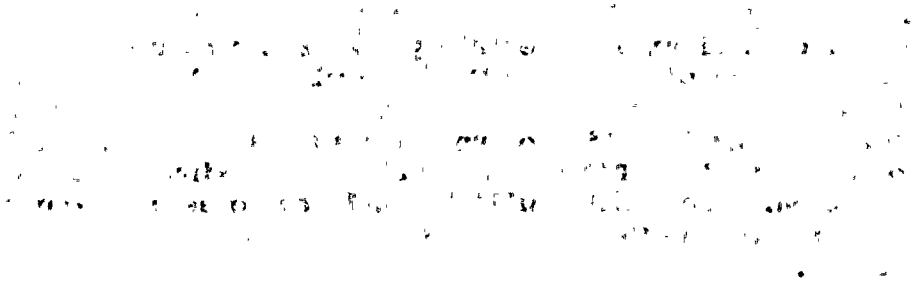
Description: This test satisfies Susquehanna Technical Specification 4.1.3.2 which states in part that scram insertion times of all control rods shall be demonstrated through measurement with reactor coolant pressure greater than 950 psig prior to exceeding 40% thermal power after core alterations.

7) TIP Asymmetry

Purpose: a) To assure proper operation of the TIP system.

b) To check core symmetry.

Description: A gross asymmetry check will be performed as well as a detailed statistical uncertainty evaluation of the TIP system. A complete set of TIP data will be obtained at a steady-state power level greater than 75% of rated power. A total average deviation or uncertainty will be determined for all symmetric TIP pairs as well as a maximum absolute deviation. The results will be analyzed to assure proper operation of the TIP system and symmetry of the core loading.



SUSQUEHANNA SES UNIT 1 CYCLE 5

PROPOSED ADDITIONAL STARTUP ACTIVITIES
SUMMARY DESCRIPTION

The following is a short summary of additional activities performed during the Startup Testing Program.

Thermal Limits Monitoring

Margins to fuel thermal limits are checked throughout the startup period through review of the POWERPLEX core monitoring system output.

TIP System - OD-1 Performance

A full set of TIPS will be run at low power level to update the core power distribution before the first core performance calculation is initiated. Subsequent TIP sets will be performed in conjunction with LPRM calibrations. The LPRM currents will be updated and the LPRM GAFS verified to be within the acceptable range.

Power Distribution Comparison with Offline Monitoring

Actual core power distribution data from the POWERPLEX Core Monitoring System will be compared to SIMULATE-E core simulation code calculations. The SIMULATE-E code, approved by the NRC (PL-NF-87-001-A) for use in Susquehanna SES core design and licensing, is used by Nuclear Fuels Engineering personnel for operations support applications throughout the cycle.

Core Flow Calibration

A core flow calibration will be performed at ∿100% core flow. Jet pump and recirculation loop flow instrumentation are adjusted if necessary to ensure correct core flow indication and correct calculation of the flow biased Rod Block and APRM Scram and Rod Block setpoints.

Recirculation Loop Baseline Data Acquisition

Recirculation loop data is collected throughout the startup program to provide baseline information for plant performance monitoring in two loop and single loop operation. This data is used throughout the cycle during the performance of the technical section Jet Pump Operability Surveillance.

PP&L Analytical Methods Benchmarking

Core physics data obtained from startup testing is used for the continued benchmarking of PP&L's CPM-2/SIMULATE-E core analysis methodology, as recommended by the NRC in its safety evaluation on PP&L's Topical Report PL-NF-87-001-A ("Qualification of Steady State Core Physics Methods for BWR Design and Analysis")

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