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LRN-03-0333



United States Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

**SALEM LOSS OF COOLANT ACCIDENT
PEAK CLAD TEMPERATURE ANNUAL REPORT
SALEM GENERATING STATION, UNIT NOS. 1 AND 2
FACILITY OPERATING LICENSE DPR-70 AND DPR-75
DOCKET NOS. 50-272 AND 50-311**

In accordance with the requirements of 10 CFR 50.46, PSEG Nuclear LLC (PSEG) hereby submits its annual report to the NRC identifying the status of the peak clad temperatures (PCTs) predicted by the Large Break (LB) and Small Break (SB) Loss of Coolant Accident (LOCA) evaluation models for Salem Generating Station. The most recent PCT report filed with the NRC for Salem is dated August 27, 2002 (Reference LRN-02-0304), and it reported the following values.

S1 LB LOCA-PCT _{last report}	= 2076°F
S1 SB LOCA-PCT _{last report}	= 1689°F
S2 LB LOCA-PCT _{last report}	= 2076°F
S2 SB LOCA-PCT _{last report}	= 1689°F

Two additional penalties have been identified, and a partial reanalysis has been performed since our last report, as described below.

- **BASH-EM Transient Termination Issue and Partial Reanalysis**

A partial reanalysis was performed for the LB LOCA transient using the latest BASH-EM code versions in order to ensure adequate termination of the fuel rod cladding temperature and oxidation transients predicted by LOCBART. The latest BASH-EM code versions have incorporated the "LOCBART transient extension method" which extends the transient beyond the point at which downcomer boiling is predicted to occur in BASH by correlating the boiling-induced reduction in downcomer driving head to a corresponding reduction in the core inlet flooding rate. The "LOCBART transient extension method" is currently under review by the NRC. Per discussions with Westinghouse, the peak clad temperature for both Salem Units

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occurs prior to the onset of downcomer boiling and continues trending downward after downcomer boiling occurs. As such, there is no impact on the PCT resulting from the "LOCBART transient extension method."

An assessment of 20°F for "Accumulator Water Temperature Increase" was allocated previously that addressed the effects of downcomer boiling. This was an evaluation rather than a plant-specific analysis and was previously reported. Use of the new LOCBART code version provides a plant-specific analytical estimation of all prior PCT assessments rather than the prior generic evaluation assessments. Thus, the new transient extension method is not a new error being addressed. Rather, it is a new explicit method used to address a previously evaluated "error" in the Analysis of Record (AOR) calculations.

A Salem-specific partial reanalysis was performed which produced a LB LOCA-PCT of 2018°F. This is an increase of +40°F from the AOR of 1978°F.

With respect to the effect on the overall PCT, the total prior assessments having a net of 48°F are replaced with a new AOR adjustment from a plant-specific reanalysis resulting in a net of 40°F. Therefore, there are no new errors being addressed here. Rather, the old errors are being reassessed on a plant-specific basis. This results in a change to the overall PCT, but it does not introduce any new reportable changes to the model or methodology.

The following previously reported items were removed due to incorporation in the partial reanalysis.

- Accumulator Line/Pressurizer Surge Line Data, LOCBART Spacer Grid Single Phase Heat Transfer Error, LOCBART Zirc-Water Oxidation Error, and Reanalysis of Limiting AOR Case (-12°F)
- LOCBART Vapor Film Flow Regime Heat Transfer Error (+9°F)
- LOCBART Cladding Emissivity Error (+6°F)
- RFA Fuel Features (+25°F)
- Accumulator Water Temperature (+20°F)

The Transition Core Penalty assessment of +50°F, previously reported, remains applicable.

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- **LOCBART ZIRLO Cladding Specific Heat Model**

The ZIRLO cladding specific heat model in LOCBART has been revised to reflect data collected at the Thermophysical Properties Research Laboratory. This change was made to resolve differences between the model and data that could produce an increase in peak cladding temperature for some transients. Westinghouse has assessed this penalty to be +15°F for the Salem Units.

The new LB LOCA-PCT rack-up is as follows.

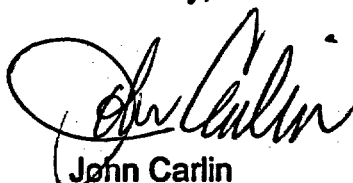
Analysis of Record (AOR)	= 1978°F	(unchanged)
Transition Core Penalty	= +50°F	(previously reported)
Rebaseline of AOR	= +40°F	(plant-specific reanalysis)
LOCBART ZIRLO Cladding Specific Heat Model	= +15°F	(not yet reported to NRC)

Thus, the current PCT for Salem Units 1 and 2 is summarized below. The Salem LOCA analyses remain within the criteria set forth in 10 CFR 50.46, and no additional analysis is necessary.

S1 LB LOCA-PCT _{current}	= 2083°F	(1978°F + 50°F + 40°F + 15°F)
S1 SB LOCA-PCT _{current}	= 1689°F	(no change)
S2 LB LOCA-PCT _{current}	= 2083°F	(1978°F + 50°F + 40°F + 15°F)
S2 SB LOCA-PCT _{current}	= 1689°F	(no change)

Should you have any questions regarding this response, please contact Michael Mosier at (856) 339-5434.

Sincerely,



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