



Portland General Electric Company

James E. Cross Vice President, Nuclear

November 8, 1990

Trojan Nuclear Plant
Docket 50-344
License NPF-1

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20505

Dear Sirs:

Update of Emergency Core Cooling
System (ECCS) Model and Application Changes

The reporting requirement of Title 10, Code of Federal Regulations, Part 50, Section 46 (10 CFR 50.46) (a)(3)(i) requires the holder of an operating license to "estimate the effect of any change to or error in an acceptable evaluation model or in the application of such a model to determine if the change or error is significant". The attached tables summarize the effects of model changes, errors, and Plant changes on the peak clad temperature (PCT) of the limiting large and small break Loss-of-Coolant Accidents (LOCAs). This letter is an update of a previous Portland General Electric Company (PGE) letter to the Nuclear Regulatory Commission (NRC) dated February 2, 1990.

The PCT limits are being updated because the magnitude of the large and small break LOCA changes total to more than 50°F above the previously reported PCT values; however, the overall PCT is still below the PCT limit of 2200°F. Thus, the large and small break LOCA changes are significant, but within acceptable limits.

For significant changes or errors, Item (a)(3)(ii) of 10 CFR 50.46 requires submittal of a proposed schedule (within 30 days) for providing reanalyses or taking other actions. This submittal also satisfies this requirement. Reanalysis is not required because the attached results demonstrate that

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Portland General Electric Company

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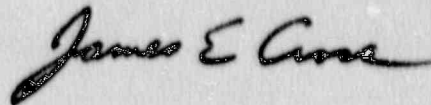
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the requirements of 10 CFR 50.46 are satisfied. The small break LOCA analysis is limiting at Trojan. As described in the Final Safety Analysis Report (FSAR), this event is an equivalent 3-inch cold-leg pipe break and is bounded by analyses of 2- and 4-inch breaks. Table 1 provides the small break LOCA PCT, and Table 2 provides the large break LOCA PCT.

To summarize, the small and large break LOCA results have changed significantly but remain within the acceptable limits of 10 CFR 50.46 acceptance criteria. This letter satisfies the reporting requirements of 10 CFR 50.46.

Sincerely,



Attachments

c: Mr. John B. Martin
Regional Administrator, Region V
U.S. Nuclear Regulatory Commission

Mr. David Stewart-Smith
State of Oregon
Department of Energy

Mr. R. C. Barr
NRC Resident Inspector
Trojan Nuclear Plant

UPDATED EMERGENCY CORE COOLING SYSTEM (ECCS)
MODEL AND APPLICATION CHANGES FOR A
SMALL BREAK LOSS-OF-COOLANT ACCIDENT (LOCA)

Final Safety Analysis Report (FSAR) Limiting
Peak Clad Temperature (PCT)

PCT = 1925°F

A. Permanent PCT Margin Allocations

- | | |
|---|-------------|
| 1. Modifications to Evaluation Model (1989) | <u>18°F</u> |
| 2. Reduced Residual Heat Removal (RHR)/
Safety Injection (SI) Flow Due to Increase
Miniflow | <u>0°F</u> |
| 3. Reduced Reactor Trip Setpoint Pressure | <u>4°F</u> |
| 4. T-hot Temperature Anomaly in One Reactor
Coolant System (RCS) Loop | <u>40°F</u> |
| 5. Auxiliary Feedwater Enthalpy Delay | <u>60°F</u> |
| 6. Charging/SI Flow Shortfall | <u>28°F</u> |

Subtotal PCT = 2075°F

B. Temporary PCT Margin Allocations

- | | |
|--|---------------|
| 7. Fuel Rod Model Inconsistency | <u>25°F</u> |
| 8. NOTRUMP Solution Convergence Reliability | <u>-104°F</u> |
| 9. Broken Loop Safety Injection Flow Assumption | <u>63°F</u> |
| 10. Small Break LOCA Rod Internal Pressure
Assumption | <u>40°F</u> |

C. Other PCT Margin Allocations

- | | |
|---|--------------|
| 11. Credit for Licensed Power Versus Analysis
Value | <u>-64°F</u> |
| 12. Reload Safety Analysis Checklist (RSAC)
Cycle 13 Pressure and Temperature Resolution | <u>35°F</u> |

D. PGE PCT Margin Allocations

- | | |
|--|-------------|
| 13. Portland General Electric (PGE) Assessment
of ECCS Flow Inconsistencies | <u>69°F</u> |
|--|-------------|

Total PCT = 2139°F

Explanations for above items:

A. Permanent PCT Margin Allocations

1. An 18°F PCT allocation due to a Westinghouse revision to the ECCS Evaluation Model in 1989. Previously reported to NRC in PGE letter dated February 2, 1990.
2. No change due to the effect of reduced RHR safety injection flow resulting from the loss of an RHR pump with a closed breaker, which results in opening the inoperable pump miniflow isolation valve. Previously reported to NRC in PGE letter dated February 2, 1990.
3. A 4°F PCT allocation for the effect of a reduction in the pressurizer low pressure reactor trip setpoint from 1855 psia to 1825 psia. Previously reported to NRC in PGE letter dated February 2, 1990.
4. A 40°F PCT allocation for the effect of one RCS loop operating at 4°F hotter than the others. Previously reported to NRC in PGE letter dated February 2, 1990.
5. A 60°F PCT allocation for the effect of a change in the Westinghouse methodology for calculating the Plant-specific auxiliary feedwater flow enthalpy delay time. Previously reported to NRC in PGE letter dated February 2, 1990 as 86°F. Reduced to 60°F due to reevaluation of AFW flow rates.
6. A 28°F PCT allocation for the effect of a shortfall in the charging safety injection flow rate.

B. Temporary PCT Margin Allocations - These are temporary PCT assessments for potential issues currently under evaluation at Westinghouse.

7. A 25°F PCT allocation due to the effect of fuel rod model inconsistencies between the ECCS Evaluation Model computer codes and the fuel rod design codes.
8. A 104°F PCT reduction due to the effect of the enhanced solution convergence time step selection criteria in the NOTRUMP code.
9. A 63°F PCT allocation for the effect of not accounting for the safety injection flow that would be injected into the broken loop for breaks smaller than the diameter of the safety injection line.
10. A 40°F PCT allocation for the effect of rod swelling when the RCS pressure is greater than fuel rod internal pressure.

C. Other PCT Margin Allocations - Specific to Cycle 13

11. A 64°F PCT reduction for the effect of reducing the assumed core power from 3558 Mwt to the licensed operating condition of 3411 Mwt.
12. A 35°F PCT allocation due to the effect of temperature and pressure violations for the Cycle 13 RSAC.

D. PGE PCT Margin Allocations

13. A 69°F PCT allocation for issues identified in Westinghouse Letter POR-89-642 related to flow balancing, degraded pump flow, and injection flow splits under degraded conditions.

UPDATED EMERGENCY CORE COOLING SYSTEM (ECCS) MODEL
AND APPLICATION CHANGES FOR A
LARGE BREAK LOSS-OF-COOLANT ACCIDENT (LOCA)

Final Safety Analysis Report (FSAR) Limiting Peak
Clad Temperature (PCT)

PCT = 1983°F

A. Permanent PCT Margin Allocations

1. Modifications to Evaluation Model (1989) 10°F
2. Reduced Residual Heat Removal (RHR)/
Safety Injection (SI) Flow Due to Increase
Miniflow 18°F
3. Reduced Reactor Trip Setpoint Pressure 0°F
4. T-hot Temperature Anomaly in One Reactor
Coolant System (RCS) Loop 0°F
5. Auxiliary Feedwater Enthalpy Delay 0°F
6. Charging/SI Flow Shortfall 0°F

Subtotal PCT = 2011°F

B. Temporary PCT Margin Allocations

7. Fuel Rod Initial Condition Inconsistency 25°F
8. Large Break LOCA Power Distribution Assumption 0°F
9. Steam Generator Tube Seismic/LOCA Assumption 60°F

C. Other PCT Margin Allocations

10. Reload Safety Analysis Checklist (RSAC)
Cycle 13 Pressure and Temperature Assumption 35°F

Total PCT = 2131°F

Explanations for above items:

A. Permanent PCT Margin Allocations

1. A 10°F PCT allocation due to a Westinghouse revision to the ECCS Evaluation Model in 1989. Previously reported to NRC in PGE letter dated February 2, 1990.
2. An 18°F PCT allocation due to the effect of reduced RHR safety injection flow resulting from the loss of an RHR pump with a closed breaker, which results in opening the inoperable pump miniflow isolation valve. Previously reported to NRC in PGE letter dated February 2, 1990.
3. No change for the effect of a reduction in the pressurizer low pressure reactor trip setpoint from 1855 psia to 1825 psia. Previously reported to NRC in PGE letter dated February 2, 1990.
4. No change for the effect of one RCS loop operating at 4°C higher than the others. Previously reported to NRC in PGE letter dated February 2, 1990.
5. No change for the effect of a change in the Westinghouse methodology for calculating the Plant-specific auxiliary feedwater flow enthalpy delay time.
6. No change for the effect of a shortfall in the charging safety injection flow rate.

B. Temporary PCT Margin Allocations - These are temporary PCT assessments for potential issues currently under evaluation at Westinghouse.

7. A 25°F allocation due to the effect of fuel rod model inconsistencies between the ECCS Evaluation Model computer codes and the fuel rod design codes.
8. No change for the effect of the power distribution shape assumption. An uncertainty factor is being applied during normal flux map surveillance to demonstrate that potentially limiting power distributions skewed to the top of the core are not present.
9. A 60°F PCT allocation for the effect of steam generator flow reduction due to tube collapse under LOCA and safe shutdown earthquake loads.

C. Other PCT Margin Allocations - Specific to Cycle 13

10. A 35°F PCT allocation for the effect of fuel rod temperature and pressure violations for the Cycle 13 RSAC.