

FGE



Portland General Electric Company
Trojan Nuclear Plant
71760 Columbia River Hwy
Rainier, Oregon 97048
(503) 556-3713

October 19, 1989
CPY-268-89

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington DC 20555

Gentlemen:

Licensee Event Report No. 89-22 is attached. This report discusses an event in which the reference temperature value used in the Rod Control System was higher than the value used in the safety analysis.

Sincerely,

C. P. Yundt
General Manager
Trojan Nuclear Plant

c: Mr. John B. Martin
Regional Administrator
US Nuclear Regulatory Commission

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

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

8910240186 891019
PDR ADCC 05000334
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11

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1): Trojan Nuclear Plant
DOCKET NUMBER (2): 0 5 0 0 0 3 4 4 1 OF 0 4

TITLE (4): 100 Percent Power Reference Temperature used in Rod Control System Program different than the value in the Safety Analysis

| EVENT DATE (5) | | | LER NUMBER (6) | | REPORT DATE (7) | | | OTHER FACILITIES INVOLVED (8) | | |
|----------------|-----|------|----------------|-------------------|-----------------|-------|-----|-------------------------------|---------------|-------------------|
| MONTH | DAY | YEAR | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | MONTH | DAY | YEAR | FACILITY NAME | DOCKET NUMBER (3) |
| 09 | 19 | 89 | 89 | 022 | 00 | 10 | 19 | 89 | n/a | 0 5 0 0 0 |

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 20.2017 (Check one or more of the following) (11)

| OPERATING MODE (9) | POWER LEVEL (10) | 20.2017(b) | 20.2017(c) | 20.2017(d) | 20.2017(e) | 20.2017(f) | 20.2017(g) | 20.2017(h) | 20.2017(i) | 20.2017(j) | 20.2017(k) | 20.2017(l) | 20.2017(m) | 20.2017(n) | 20.2017(o) | 20.2017(p) | 20.2017(q) | 20.2017(r) | 20.2017(s) | 20.2017(t) | 20.2017(u) | 20.2017(v) | 20.2017(w) | 20.2017(x) | 20.2017(y) | 20.2017(z) | OTHER (Specify in Abstract below and in Test, NRC Form 305A) |
|--------------------|------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|--|
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LICENSEE CONTACT FOR THIS LER (12):
NAME: John Guberski Compliance Engineer
TELEPHONE NUMBER: 5 0 3 5 5 6 1 - 5 5 2 3
AREA CODE: 5 0 3

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC |
|-------|--------|-----------|--------------|-------------------|-------|--------|-----------|--------------|-------------------|
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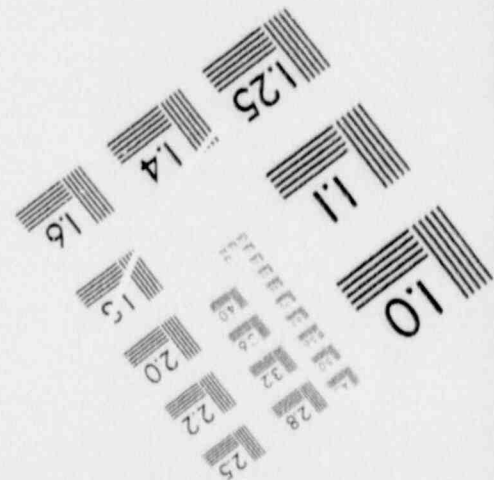
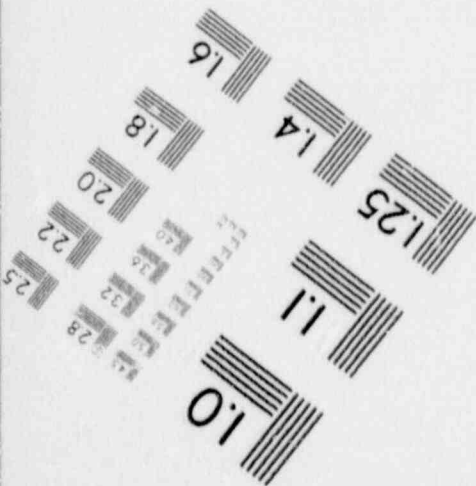
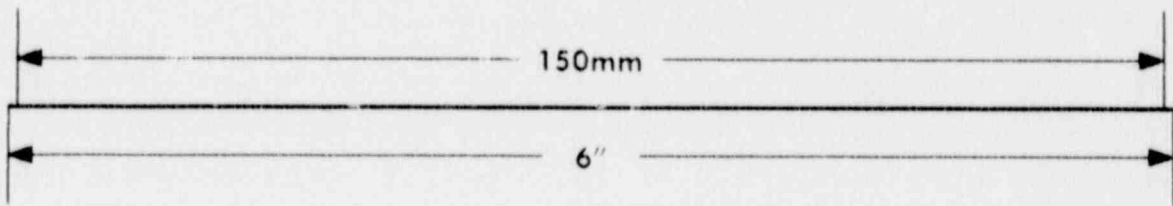
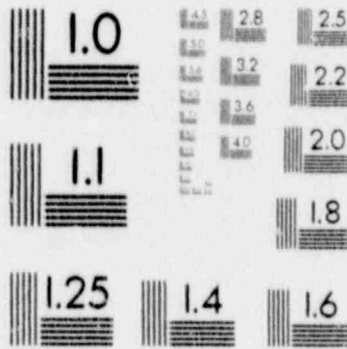
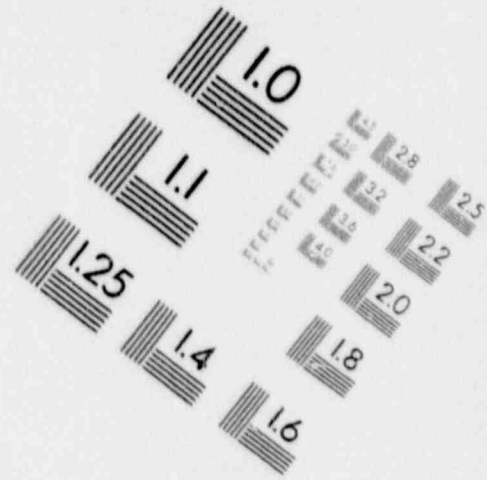
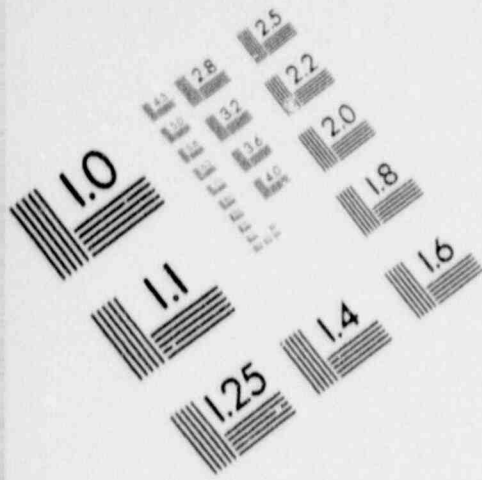
SUPPLEMENTAL REPORT EXPECTED (14):
YES (If yes, complete EXPECTED SUBMISSION DATE) NO
EXPECTED SUBMISSION DATE (15): MONTH DAY YEAR

ABSTRACT (Limit to 1000 words, i.e., approximately 8000 characters maximum) (16)

On September 19, 1989 an investigation was continuing into a Reactor Coolant System (RCS) loop average temperature imbalance as a contributing cause of spurious Overtemperature Delta Temperature alarms. During a discussion with the Nuclear Steam Supply System (NSSS) vendor it was determined that the current maximum setpoint temperature (T-ref) for the Rod Control System was non-conservative with respect to the T-ref used in the Trojan safety analyses. This non-conservatism was due to a miscommunication between Portland General Electric and the NSSS vendor in 1976. The temperature imbalance, discovered during initial startup testing, caused RCS bulk average temperature (T-avg) to be lower than the design value of 584.7 degrees F, which caused the secondary steam pressure to also be lower than design. To achieve design T-avg (for the bulk RCS) and secondary steam pressure, T-ref was raised 1.7 degrees F. The NSSS vendor, who was aware of the loop temperature imbalance, was informed by letter in September 1976 that T-avg was to be increased but specifics on how this was to be accomplished were not provided in the letter. No negative response was received from the NSSS vendor on this change, nor did they identify a need for a new analysis. Corrective actions include changing the 100 percent power T-ref to the value used in the safety analyses, performing a safety evaluation to determine if any safety analyses/setpoints for the current operating cycle were impacted, and evaluating the effects of operating with a T-ref higher than that used in the safety analyses. Based on these evaluations, this event did not cause a significant degradation of operational safety nor have any effect on public health and safety.

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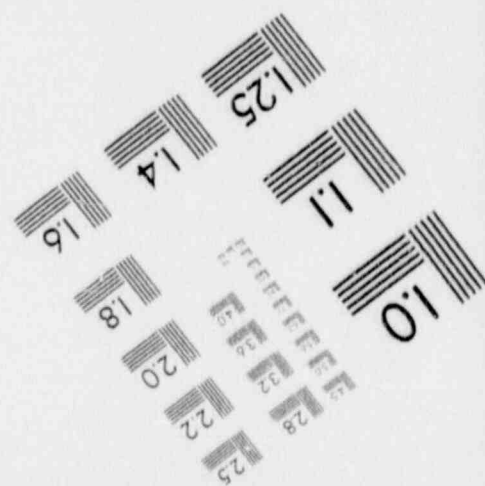
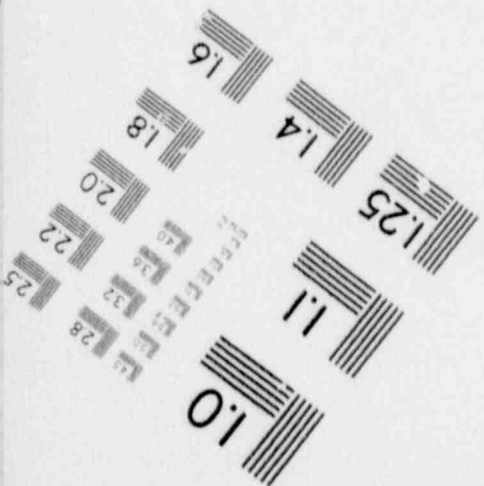
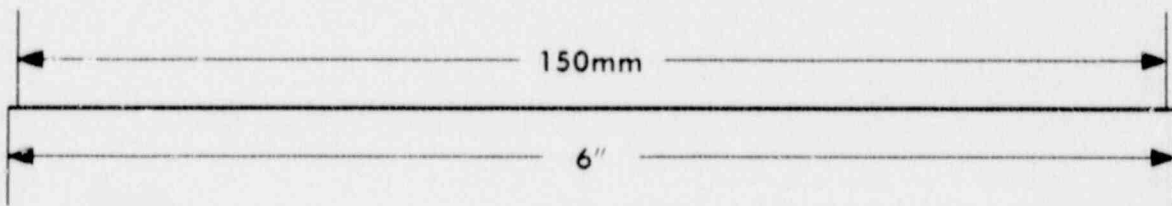
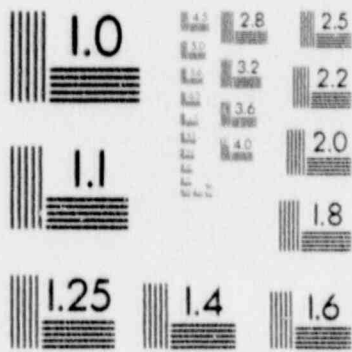
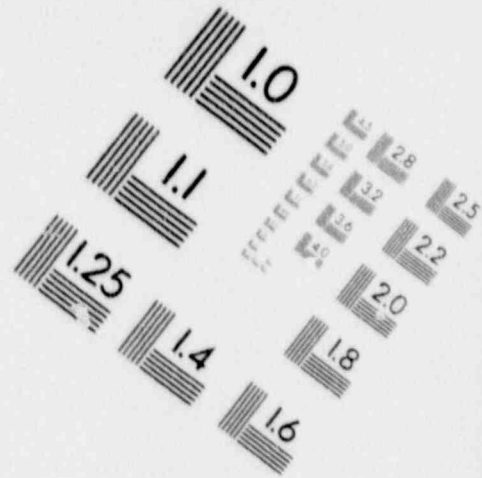
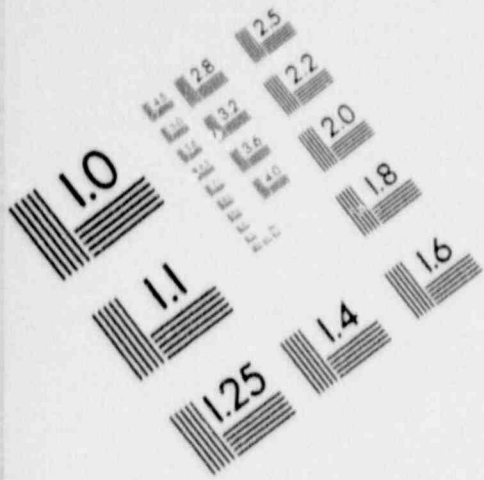
IMAGE EVALUATION TEST TARGET (MT-3)



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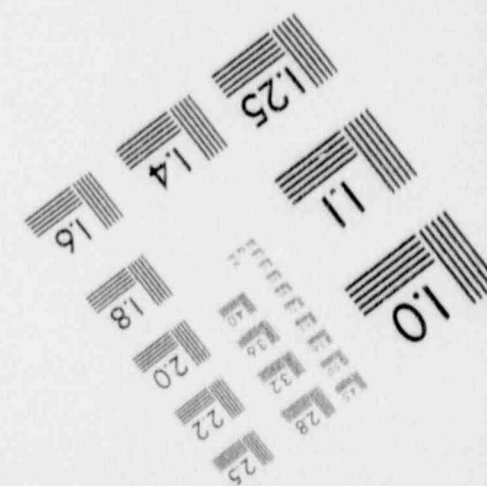
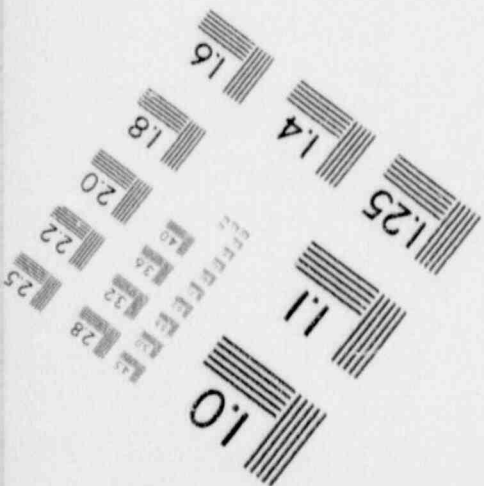
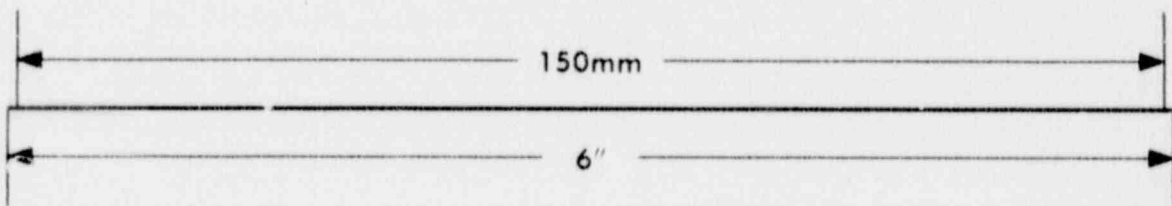
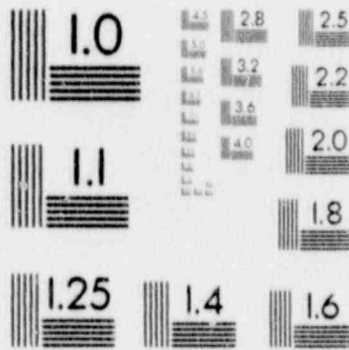
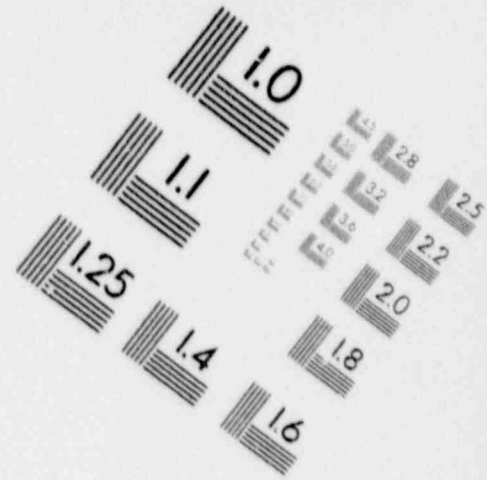
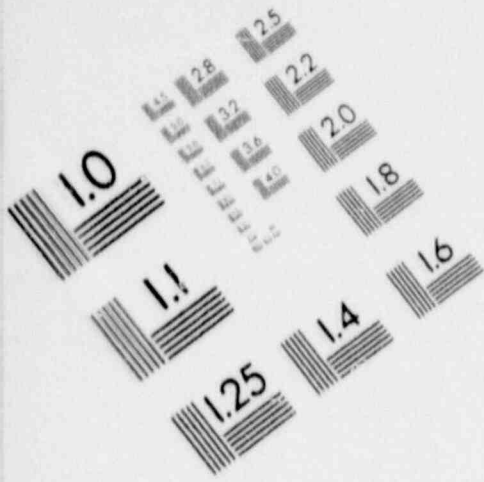
IMAGE EVALUATION TEST TARGET (MT-3)



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IMAGE EVALUATION TEST TARGET (MT-3)



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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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|-------------------|-------------------|-------------------|-------------------|-----------------|----------|-----|--------|
| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (5) | | | PAGE (3) | | |
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TEXT IF MORE SPACE IS REQUIRED, USE ADDITIONAL NRC Form 2004 (1/77)

DESCRIPTION OF OCCURRENCE

Trojan's Reactor Coolant System (RCS) loops have historically operated with a loop average temperature imbalance of approximately 2 to 4 degrees F. This imbalance has existed since the initial Trojan startup in 1976, based on review of the startup test results. This imbalance was higher than expected but was within acceptable values. It was concluded in 1976 that the small reactor coolant loop temperature imbalance was real (there was no indication of a core power or temperature asymmetry that was not within limits) and agreed with a secondary side power imbalance but neither imbalance presented a nuclear safety concern.

This temperature imbalance (Loop D generally having the highest indicated average temperature) was raised as an additional contributing cause for the spurious actuation of the Loop D Overtemperature Delta Temperature bistables, as well as other events involving Over Temperature Delta Temperature which occurred in mid- to late August 1989. Plant internal Event Reports 89-131, 135, 144, 169, 181, 187 were generated to evaluate these events, and a task group was assigned to investigate the problem. During a discussion with the NSSS vendor about this imbalance on September 19, 1989, it was determined that operating the reactor's Rod Control System with a setpoint temperature (T-ref) value of 586.4 degrees F for 100 percent power was non-conservative with respect to the T-ref value used in the safety analysis for the Trojan Nuclear Plant. Note that the Rod Control System selects the highest loop average temperature to use in the comparison with T-ref.

The T-ref used in the NSSS vendor's Setpoint Document was 584.7 degrees F. T-ref was changed in 1976, by Portland General Electric Company, to compensate for the RCS bulk average temperature (T-avg) being 583.5 rather than 584.7 degrees F. The T-ref value was increased from 584.7 to 586.4 degrees F to allow T-avg to reach 584.7 degrees F. This change of plus 1.7 degrees F in T-ref compensated for the rod control system controlling on the highest loop T-avg, thus allowing the plant to achieve design RCS T-avg and secondary steam pressure. The NSSS vendor was informed, by letter in September 1976, that T-avg was to be increased but specifics on how this was to be accomplished were not provided in the letter. No negative response was received from the NSSS vendor on this change, nor did they identify a need for a new analysis. The letter did indicate that this change would be done with the concurrence of the NSSS vendor but no documentation of this concurrence can be located in the files by either company. The loop average temperature imbalance was again identified to the NSSS vendor for the cycle 9 reload in the safety evaluation checklist. The NSSS vendor did not identify any problem with the loop temperature imbalance in the reload safety evaluation.

After evaluating this condition, discussing the results with the Nuclear Regulatory Commission, and completing a review of the Reactor Protection System permissive setpoints for any dependence on a T-ref value, the plant's T-ref was lowered to the design value of 584.7 degrees.

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| FACILITY NAME (1) | DOCKET NUMBER (2) | LER NUMBER (5) | | | PAGE (3) | |
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| Trojan Nuclear Plant | 050000344 | 89 | 022 | 00 | 03 OF 04 | |

TEXT IF more space is required, use additional NRC Form 200A's (17)

CAUSE OF OCCURRENCE

Failure by personnel involved in changing T-ref to realize (in 1976) that changing T-ref from 584.7 to 586.4 degrees F could affect the safety analysis. The NSSS vendor was aware of the loop average temperature imbalance from test data sent to them and was informed of the change in T-avg but a specific request for a reanalysis at the new T-avg (or the new T-ref) was not submitted. No negative response was received from the NSSS vendor on this change, nor did they reference a need for a new analysis. A contributing cause was only discussing raising full power T-avg from 583.5 to 584.7 degrees F in correspondence and relying on inference that this would be accomplished by raising the T-ref value.

CORRECTIVE ACTIONS

Corrective action was to lower the T-ref value to that used in the safety analysis.

A safety evaluation was completed for operating the plant with the existing RCS loop temperature imbalance and the impact of the imbalance on the Loss of Coolant Accident (LOCA), non-LOCA, and Steam Generator Tube Rupture safety analyses. This evaluation used a T-ref of 584.7 degrees F. A review by the NSSS vendor of the physical effects on RCS components of past operation with a T-ref of 586.4 degrees F was also performed. The safety significance of a T-ref of 586.4 degrees F on the LOCA, non-LOCA, and Steam Generator Tube Rupture safety analyses for past operation will be evaluated. This change in T-ref is not expected to significantly affect these analyses.(CTL #31225)

SIGNIFICANCE OF OCCURRENCE

The NSSS vendor evaluated the effects of the loop temperature imbalance on the present safety analysis and concluded that the imbalance does not produce an unreviewed safety question with respect to the LOCA, non-LOCA, and steam Generator Tube Rupture safety analyses with a T-ref of 584.7 degrees F. The issue of the T-ref being at a value different from that assumed in the NSSS vendor's Setpoint Study was not assessed relative to the safety analysis since the Departure from Nucleate Boiling (DNB) Ratio safety analysis values embodied in all the relevant technical specifications assure that a reactor trip will occur irrespective of a small non-conservatism in the initial condition of any one parameter. Also, the NSSS vendor did not identify any problem with the loop temperature imbalance in the cycle 9 reload safety evaluation.

In the NSSS vendor's judgement, the physical effect on RCS components of past plant operation with T-ref of 586.4 degrees F versus the plant design value of 584.7 degrees F does not represent a significant safety question. This

LICENSEE EVENT REPORT (LER) TEXT CONTINUATION

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| FACILITY NAME (1): Trojan Nuclear Plant | DOCKET NUMBER (2): 0 5 0 0 0 3 4 4 8 9 | LER NUMBER (5): | | | PAGE (3): | |
| | | YEAR | SEQUENTIAL NUMBER | REVISION NUMBER | | |
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TEXT (if more space is required, use additional NRC Form 200A 1/117)

engineering judgement is based upon the knowledge that, in general, the NSSS vendor's component designs contain sufficient conservatism and design margins so as not to be adversely affected by events such as this.

Based on the these evaluations, and the conclusion that an increase of 1.7 degrees F in T-ref is not expected to significantly affect the safety analyses, this event did not cause a significant degradation of operational safety nor have any effect on public health and safety.