UPDATE REPORT - PREVIOUS REPORT DATE 04/22/82



# LICENSEE EVENT REPORT

CONTROL BLOCK: | | | | | | | (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

| | |
|---|---|
| 01 | LICENSEE CODE: WILBR1 (2) LICENSE NUMBER: 00-00000-00 (3) LICENSE TYPE: 41111 (4) CAT (5) |
| CON'T 01 | REPORT SOURCE: L (6) DOCKET NUMBER: 050-0409 (7) EVENT DATE: 122481 (8) REPORT DATE: 080682 (9) |

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

02 FOLLOWING A REACTOR SCRAM, THE TEMPERATURE OF THE 1B FORCED CIRCULATION
03 LOOP PIPING DECREASED TO A MINIMUM OF 86°F. TS 4.2.2.4.E REQUIRES TEMPE
04 RATURE BE >/= 130°F WHEN PRESSURE IS >/= 280 PSIG. PRESSURE VARIED BETW
05 EEN 680 and 1145 PSIG WHEN TEMPERATURE <130°F. THE TEMPERATURE OF THE L
06 OOP WAS ABOVE NDT AT ALL TIMES. NO CONSEQUENCES.
07
08

| 09 | SYSTEM CODE | CAUSE CODE | CAUSE SUBCODE | COMPONENT CODE | COMP. SUBCODE | VALVE SUBCODE |
|---|---|---|---|---|---|---|
| | CB (11) | X (12) | Z (13) | PIPEXX (14) | E (15) | Z (16) |

| (17) LER/RO REPORT NUMBER | EVENT YEAR | | SEQUENTIAL REPORT NO. | | OCCURRENCE CODE | REPORT TYPE | | REVISION NO. |
|---|---|---|---|---|---|---|---|---|
| | 81 | — | 015 | / | 01 | X | — | 2 |

| ACTION TAKEN | FUTURE ACTION | EFFECT ON PLANT | SHUTDOWN METHOD | HOURS (22) | ATTACHMENT SUBMITTED | NPRD-4 FORM SUB. | PRIME COMP. SUPPLIER | COMPONENT MANUFACTURER |
|---|---|---|---|---|---|---|---|---|
| H (18) | G (19) | C (20) | Z (21) | 0000 | Y (23) | N (24) | N (25) | X999 (26) |

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

10 INOPERATION OF FORCED CIRCULATION PUMP 1B DUE TO SEAL PROBLEMS FOLLOWING
11 SCRAM AND COMBINATION OF SEAL INJECTION AND PURIFICATION SYSTEMS MANAGE
12 MENT AND LACK OF TEMPERATURE MONITORING. OPERATORS HAVE RECEIVED ADDITI
13 ONAL TRAINING AND PROCEDURES HAVE BEEN MODIFIED. LOG SHEETS NOW SPECIFY
14 WHEN SPECIFIC READINGS NEED TO BE TAKEN.

| 15 | FACILITY STATUS | % POWER | OTHER STATUS (30) | METHOD OF DISCOVERY | DISCOVERY DESCRIPTION (32) |
|---|---|---|---|---|---|
| | X (28) | 000 (29) | SCRAM RECOVERY | A (31) | SUPERVISOR OBSERVATION |

| 16 | ACTIVITY RELEASED | CONTENT OF RELEASE | AMOUNT OF ACTIVITY (35) | LOCATION OF RELEASE (36) |
|---|---|---|---|---|
| | Z (33) | Z (34) | NA | NA |

PERSONNEL EXPOSURES

| 17 | NUMBER | TYPE | DESCRIPTION (39) |
|---|---|---|---|
| | 000 (37) | Z (38) | NA |

PERSONNEL INJURIES

| 18 | NUMBER | DESCRIPTION (41) |
|---|---|---|
| | 000 (40) | NA |

LOSS OF OR DAMAGE TO FACILITY (43)

| 19 | TYPE | DESCRIPTION |
|---|---|---|
| | Z (42) | NA |

8208200223 820806
PDR ADOCK 05000409
S PDR

PUBLICITY

| 20 | ISSUED | DESCRIPTION (45) | NRC USE ONLY |
|---|---|---|---|
| | N (44) | NA | |

NAME OF PREPARER: L. S. GOODMAN PHONE: 608-689-2331

## 1B FORCED CIRCULATION LOOP TEMPERATURE

| TIME | *TEMPERATURE (°F) | PRESSURE (PSIG) | RATE OF TEMPERATURE CHANGE BY HOUR AFTER SCRAM |
|---|---|---|---|
| 2115 | 551 | 1240 | |
| 2215 | 384 | 1215 | -167°/HR |
| 2315 | 234 | 1140 | -150°/HR |
| 0015 | 138 | 1080 | - 96°/HR |
| 0017 | 132 | | |
| 0115 | 101 | 1065 | - 37°/HR |
| 0215 | 91 | 1145 (Max. Press. below 130°F) | - 2°/HR |
| 0223 | 90 | 1100 | |
| 0315 | 88 | 940 | - 3°/HR |
| 0341 | 86 | 720 | |
| ↓ | 87 | | |
| 0345 | 86 | 0346 680 | (-4°/HR 0315-0345) |
| ↓ | 87 | | |
| 0354 | 86 | 735 | |
| 0356 | 87 | | |
| 0415 | 90 | 820 | + 2°/HR |
| 0427 | 93 | | |
| 0430 | 109 | 820 | |
| 0433 | 182 | 820 | |
| 0435 | 212 | | |
| 0444 | 284 | 815 | |
| 0515 | 263 | 780 | +173°/HR |

*2°F was added to chart reading up until 0403 when chart paper returned to track. The chart was off up to 4°F.

## EVENTS FOLLOWING SCRAM OF DECEMBER 23, 1981

### 1A FCP

An attempt was made to start 1A FCP to restore circulation in that loop at 2300 and again at 0205. Each time the motor was started ,it operated satisfactorily. When the speed control switch was released from pullout, however, the pump speed did not increase and the motor current increased to approximately 40 amp, which is 10 to 15 amp higher than normal and the motor was immediately shutdown.

It is believed that since the seal inject leak-off temperature reached approximately 200°F when the loss of power occurred, that reactor water heated the pump shaft while there was no seal inject flow, causing the shaft to expand. Since the lower seals (See Attached Figure) have very little clearance, while the upper seal is very loose on 1A FCP, resulting in excessive leak-off flow, the expansion of the shaft effectively closed the gap between it and the lower seal rings.

A considerable time was necessary for the pump shaft to cooldown, temperatures to equalize, and for the shaft to contract to its normal size. The seal injection heaters were turned on at approximately 0240, which helped reduce the effect of shrinkage of the lower seal rings and equalize temperature.

Another attempt to start 1A FCP was made at 0410 and the pump operated satisfactorily.

1B FCP

After the loss of power and scram, it was noted that 1B FCP seal leak-off temperature was 175°F; also, there was a low leak-off flow alarm on 1B FCP. Seal inject flow was varied up and down in an attempt to lower the leakoff temperature and to clear the low leakoff alarm. The leak-off was checked and found to be .1 gpm. At a reactor pressure of near 1100 psig, attempts were made to shift the seal inject point selector valve (52-25-006) from lower to upper position to reduce flow into the loop and to obtain more leak-off to clear the low leak-off interlock which would allow the pump to be started. The valve would not shift from lower to upper inject point. Efforts were also made to shift the valve while attempting to manually aid valve stem movement with no success. An air leak was noted at an air fitting to the valve operator. The valve eventually operated satisfactorily at the same time that the low leak-off alarm cleared. It is believed that the reason that the inject point could not be switched from upper to lower injection points was due to a hydraulic lock between the upper inject point at the pump seal and the corresponding port of the valve, along with reduced operating air capacity due to the broken air line. When the leak-off alarm cleared due to the increase in leakoff flow, the hydraulic lock was also gone and the valve operated normally.

The seal injection heaters were placed in service to reduce cooling of the loop when it was noted that the 1B loop suction temperature was below 130°F.

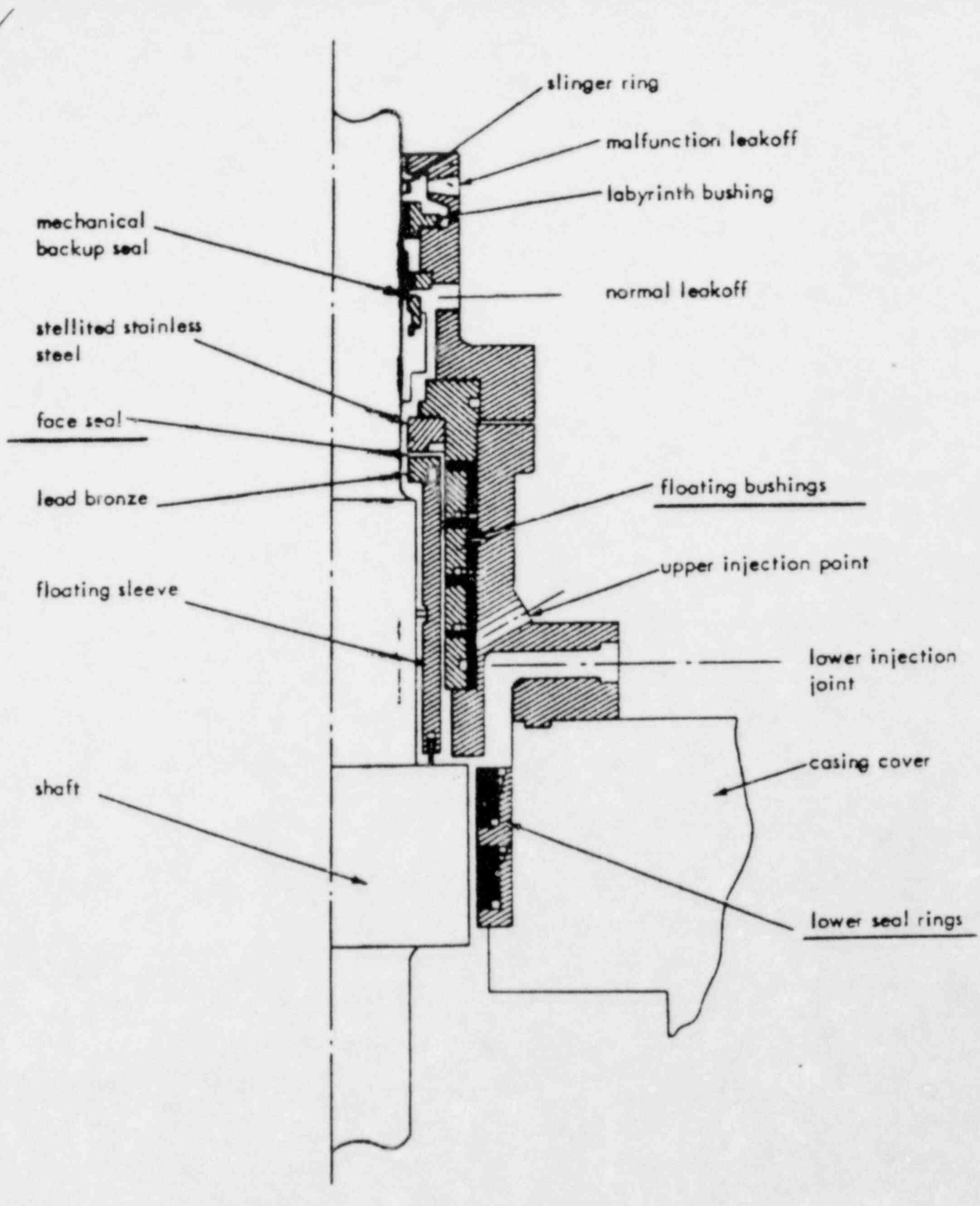
It is believed that the high temperatures caused swelling of the pump shaft and since the face seal and floating bushings on 1B FCP are tighter than those on 1A FCP. This closed off the seal, resulting in the seal inject water flowing into the FC loop rather than up through the seals.

The FCP's will not start if the leak-off flow is less than .2 gpm, therefore a considerable soak time was required for the pump shaft to cooldown and contract to its normal size. The turning on of the seal inject heaters may have also have helped to clear the low leak-off alarm by equalizing temperatures, and reducing the contraction of the floating bushings against the pump shaft and aided in opening the clearances.

The leak-off alarm cleared at 0332 and the injection point valve worked as described above.

At 0349 1B FCP was started and operated satisfactorily.

The control airline leading to the valve operator for the seal injection point selector valve has been repaired.




FORCED CIRCULATION PUMP SEAL FIG. 10.1

RECD JAN 21 1982

NES
NUCLEAR ENERGY SERVICES, INC.

January 15, 1982
Reference No.: 5101-780

Mr. John Parkyn
Dairyland Power Cooperative
LaCrosse Boiling Water Reactor
P. O. Box 135
Genoa, WI 54632

Subject: Evaluation of Thermal Stresses Resulting of Heat-up of Re-circ. Loop 1B Following Pump Restart

Dear Mr. Parkyn:

We have evaluated the potential for adverse conditions of thermal stress on the Recirculation Loop pipe wall for the heatup conditions described by you over the phone on Friday, January 15. The following assumptions and data were used:

- Pipe wall thickness = 1.281" (corresponds to 20" sch. 100).
- The fluid is subject to a constant heatup rate of 800°F per hour for 15 minutes.
- The Biot Number applicable to transfer of heat from pipe to coolant is taken to be 10 = $h\delta/k$ . This assumption is made for convenience in determining the temperature distribution through the pipe wall vs. time. This assumption is conservative since the actual Biot Number based on a flowrate of 130 gpm is less than 1.0. (Higher Biot Numbers are indicative of more efficient convective heat transfer to the fluid relative to the conductive heat transfer in the pipe wall. The higher Biot Number chosen here therefore maximizes $\Delta T$ through the wall, ensuring a conservative (higher) estimate of thermal stress).

Based upon the above, the maximum $\Delta T$ across the loop piping wall at any time during the heatup at 800°F/hr. is 13°F. This results in an equivalent linear thermal gradient stress in the pipe wall of 2.2 ksi ( 2,200 psi). This is less than 10 percent of the specified minimum yield stress of 30,000 psi for the chrome-moly piping (A 335).

Sincerely,

NUCLEAR ENERGY SERVICES, INC.
NES Division

Craig Finnan

/al

Craig Finnan,
Project Engineer

DAIRYLAND POWER COOPERATIVE • P O BOX 817 • 2615 EAST AV SOUTH • LA CROSSE WISCONSIN 54601
(608) 788-4000

January 7, 1982

In reply, please
refer to LAC-8010

DOCKET NO. 50-409

Director of Nuclear Reactor Regulation
ATTN: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Operating Reactors
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
PROVISIONAL OPERATING LICENSE NO. DPR-45
RECIRCULATION LOOP PIPING NIL-DUCTILITY
TRANSITION TEMPERATURE EVALUATION

Reference: (1) DPC Letter, LAC-8007, Linder to Keppler, dated January 6, 1982, Reportable Occurrence No. 81-15.

Gentlemen:

Attached is the independent analysis of the referenced incident which involved an occurrence on December 24, 1981, in which the temperature of the 1B Forced Circulation Loop decreased below 130° F., while primary pressure was greater than 280 psig. Reference 1 stated that a report covering an independent analysis by Nuclear Energy Services (NES) would be submitted. Contained, herein, is the NES evaluation of the conditions the 1B loop experienced.

The information being submitted with this letter has been reviewed by LACBWR committees as prescribed in Technical Specifications.

A prompt review of this submittal would be very much appreciated.

Very truly yours,

DAIRYLAND POWER COOPERATIVE

for Frank Linder, General Manager

FL:LSG:af
Attachment

cc: J. G. Keppler, Reg. Dir., NRC-DRO III
NRC Resident Inspector

Goodman

RECD JAN 11 1982

NES
NUCLEAR
ENERGY
SERVICES, INC.

January 7, 1982
Reference No.: 5101-777

Mr. Richard E. Shimshak
Dairyland Power Cooperative
LaCrosse Boiling Water Reactor
P. O. Box 135
Genoa, WI 54632

Subject: Recirculation Loop Piping Nil-Ductility Transition Temperature Evaluation

Reference: Telecopy of Reactor Coolant Loop 1B Temperature and Pressure Data, L. Goodman to C. Finnan, December 31, 1981

Dear Mr. Shimshak:

Per your request, we have analyzed the operating data for the several hours following the scram of December 23, 1981 during which Loop 1B temperatures were below Technical Specification limits. The purpose of our evaluation was to determine whether Code prescribed limits on approach to NDT had in fact been violated or if any potential hazard existed with regard to brittle fracture.

The results of our analyses indicate that at no time following scram were ASME B & PV Code Appendix G requirements regarding margin above $RT_{NDT}$ violated. For the worst coincident pressure temperature conditions (1145 psig - 91°F at 0215 hours per Reference) the minimum loop temperature allowed per Section III Appendix G is 79°F. Thus, there was a margin of 12°F above the minimum allowable temperature.

The calculation of the thermal stress intensification factor, $K_{It}$, was based upon an assumed constant cooldown rate of 300°F per hour. Since the maximum observed rate of cooldown was -167°F in one hour (and decreased thereafter), our results are conservative. Copies of the pertinent calculations are enclosed.

Copies
Towsley

If you have any questions or if we can be of further help, please call.

Very truly yours,

NUCLEAR ENERGY SERVICES, INC.
NES Division

Craig Finnan

Craig Finnan,
Project Engineer

/al
enclosures
cc: J. Taylor
L. Goodman
H. Towsley
W. Manion

ATTACHMENTS

- SUMMARY OF RESULTS
- CALCULATION, MAXIMUM PIPE WALL $\Delta T$
- CALCULATION, CONFORMANCE WITH NDT REQUIREMENTS OF ASME SECTION III, APPENDIX G

SUMMARY OF RESULTS

LOOP 1B

| TIME | PRESSURE (PSIG) | TEMPERATURE ($^{o}F$) | MIN. ALLOWABLE TEMPERATURE PER ASME CODE ($^{o}F$) | MARGIN ($^{o}F$) |
|---|---|---|---|---|
| 0115 | 1065 | 101 | 64 | +37 |
| 0215 | 1145 | 91 | 79 | +12 |
| 0223 | 1100 | 90 | 71 | +19 |
| 0315 | 940 | 88 | 31 | +57 |

| | REF. |
|---|---|
| MAXIMUM ΔT ACROSS RE-CIRCULATION LOOP PIPE WALL | |

## Statement of Problem

Cold water was introduced into the 1B recirculating line at the La Crosse Boiling Water Reactor. The temperature element at the bottom of the suction loop was observed to drop from 550°F to 86°F at a maximum rate of 167°F in one hour. For conservatism in the analysis a constant cooldown rate of 300°F/hr was assumed. The maximum ΔT between the inner and outer pipe wall surfaces over the entire cooldown period is to be found.

## Applicable Criteria and Assumptions

1. The pipe wall was modeled as a flat plate with an insulated back face. (chap 6, p8, ref 1)
2. Because one side of the pipe is insulated, there is no heat flow thru the outside surface of the pipe.
3. The fluid temperature varies linearly with time.
4. The pipe material is $1\frac{1}{4}$ Cr and $\frac{1}{2}$ Mo (see reference 3) 3
5. The pipe wall thickness is 1.031" (schedule 80, A335, Gr. P11) 3
6. The Biot number, $\bar{h}\delta/k$, where $\bar{h} \approx 10$ BTU/hr ft² °F (assumed), $k = 22$ BTU/hr ft °F, $\delta = (1.031/12)$ ft 2

   is $< 0.1$.

Maximum $\Delta T$ Across Re-Circulation Loop Pipe Wall | REF.

## References

1. Design Guide for LMFBR Sodium Piping, Vol II, Procedures USAEC, 22 August 1969, chapter 6, p. 12, Figure 6.5.
2. ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components Division 1, Appendices, The American Society of Mechanical Engineers, New York, 1980 Edition, p 83, Table I-4.0 Mat'l Group B (under TD).
3. LACBWR Piping Spec, Group V, A, Class 900-HT-A.

## Method of Approach

The graphs from reference 1 represent solutions to the transient heat condition equation for various geometries and boundary conditions. The graph that was used shows the temperature response as a function of fluid temperature change, $\Delta T_f$; Biot number, $h\delta/k$; and Fourier number, $\alpha\tau/\delta^2$.

$$\Delta T = f(\Delta T_f, \frac{h\delta}{k}, \frac{\alpha\tau}{\delta^2}) = \Delta T_f / C_1\tau$$

The fluid temperature change, $\Delta T_f$, is the total fluid temperature change up to the time of interest. The Biot number is a ratio of the heat transfer in the fluid, represented by the heat transfer coefficient $h$, to the heat transfer in the pipe wall represented by $k/\delta$, where $k$ is the thermal conductivity of the pipe material, and $\delta$ is the wall thickness. The Fourier number is the ratio of heat transfer to heat capacity in the pipe. $\Delta T_s$ or $\Delta T$ the change in surface temperature and $C_1\tau$ or $C\theta$ is the total change in fluid temperature. The lowest value for the Biot number, $h\delta/k = 10$, for the inner surface was used. This was conservative since $10 >> 0.1$. 1

**NUCLEAR ENERGY SERVICES**

BY: CTD DATE: 12/31/81 PROJ.: 5101 TASK: 099

CHKD.: CFF DATE: 1/5/82 PAGE: 3 OF: 5

## Maximum ΔT Across Re-Circulation Loop Pipe Wall

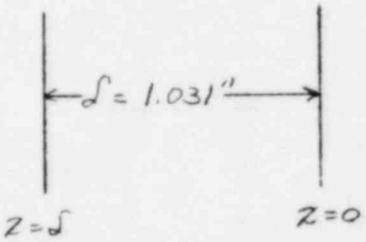
REF.

$C = -300\,°F/hr$ 1

$T = \Theta = \frac{t_o - t}{300}\ hr \qquad t_o = 550°F$ ✓ 1

$\alpha = 0.37\ ft^2/hr \qquad$ (ref 2)

$\delta = \frac{1.031}{12}\ ft \qquad$ (ref 1)




$T = \frac{(t - t_o)}{C\Theta} \qquad F_o = \frac{\alpha\Theta}{\delta^2}$ ✓ 1

$t_s = 86°F$ ✓

$\Theta_s = \frac{550-86}{300} = 1.54666\ hr$ ✓

$F_o = \frac{0.37\ ft^2/hr \cdot 1.54666}{\left(\frac{1.031}{12}\right)^2 ft^2} = \underline{\underline{77.53}}$ —

$T = 1.0 = \frac{t - 550}{-300 \times 1.54666} \Rightarrow t = \underline{\underline{86°F}}$ ✓ 1

$T = 0.99 = \frac{t - 550}{-300 \times 1.54666} \Rightarrow t = 90.6°F \approx \underline{91°F}$ —

$\underline{\underline{\Delta T = 5°F}}$ —

# Maximum ΔT Across Re-Circulation Loop Pipe Wall

REF.

When $F_o = 1$ $\theta = 0.02 hr$ 1

$T = 0.91 = \frac{t - 550}{-300 \times 0.02} \Rightarrow t = 544.5°F \approx 545°F$

$\Delta T = 2°F$

$T = 0.54 = \frac{t - 550}{-6} \Rightarrow t = 547°F$

When $F_o = 10$ $\theta = 0.2 hr$

$T = 0.99 = \frac{t - 550}{-300 \times 0.2} \Rightarrow t = 490°F$

$\Delta T = 4°F$

$T = 0.93 = \frac{t - 550}{-60} \Rightarrow t = 494°F$

When $F_o = 40$ $\theta = 0.8 hr$

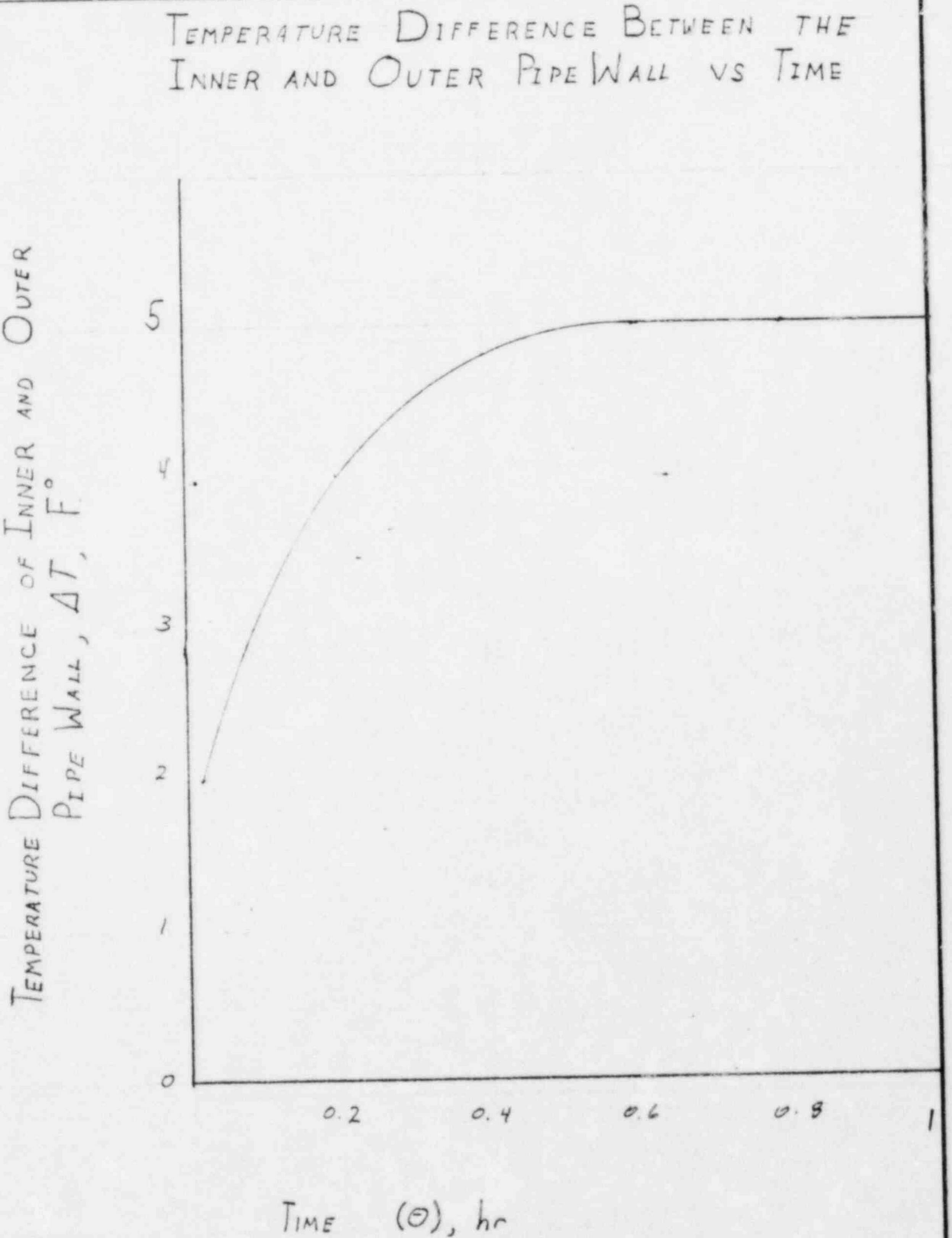
$T = 1.0 = \frac{t - 550}{-300 \times 0.8} \Rightarrow t = 310°F$

$\Delta T = 5°F$

$T = 0.98 = \frac{t - 550}{-240} \Rightarrow t = 315°F$

Maximum ΔT Across Re-Circulation Loop Pipe Wall

REF.



CONFORMANCE WITH NDT REQ. OF ASME SECT. III | REF.

STATEMENT OF THE PROBLEM:

TO EVALUATE CONFORMANCE TO ASME SECT. III APPENDIX G REQUIREMENTS FOR NDT FOLLOWING THE SCRAM OF DEC. 24, 1981. FOLLOWING THIS SCRAM, LOOP 1-B TEMP. WERE BELOW THE TECHNICAL SPECIFICATION LIMITS. (REF. 1)

LIST OF APPLICABLE CRITERIA:

1. ASME SECT III, APPENDIX G (REF 2)
2. TECHNICAL SPECIFICATIONS, (REF. 1)

ANALYSIS DATA: (FROM REF. 3)

| P (psi) | TEMP. (°F) |
|---|---|
| 1065 | 101 |
| 1145 | 91 |
| 1100 | 90 |
| 940 | 88 |

LINEAR THERMAL GRADIENT ACROSS THE WALL FOR THE TRANSIENT = 5°F [REF. ΔT CALCULATION BY C.T. DISMUKE, NES, DATED DEC. 30, 1981].

ASSUMPTIONS:

THE CALCULATION APPROACH IS SIMILAR TO THAT GIVEN IN REF. 1 & 2 FOR THE REACTOR VESSEL.

CONFORMANCE WITH NDT REQUIREMENTS OF ASME SECT. III. | REF.

THE FOLLOWING CALCULATIONS ARE BASED ON THE REQUIREMENTS OF ASME CODE SECTION III, APPENDIX G.

MEMBRANE STRESS $\sigma_m$ $= \frac{Pr}{t} + \frac{P}{2} = \frac{P}{t}(r + t/2) = 9.199\,P$ ✓ — 1

EQUIVALENT THERMAL GRADIENT LINEAR STRESS, $\sigma_t$

$\sigma_t = \frac{E \alpha \Delta t_w}{2(1-\nu)} = \frac{29.5 \times 10^6 \times 7.99 \times 10^{-6} \times 5}{2(1-0.03)} = 0.853$ ksi ✓ — 1

$[\Delta T_w \not> 5°F$

$\sigma_Y$ = SPECIFIED YIELD STRESS = 30 ksi ✓ [ASTM A335]

$M_m = 1.9$ [FROM FIG G 2214-1 for $\frac{\sigma}{\sigma_Y} = \frac{10,580}{30000} = 0.353$] ✓ — 2

MEMBRANE $K_{I_M} = \sigma_m \times M_m = 9.199 \times 1.9 \times P$ ✓ — 2

$K_{T_t} = \frac{2}{3}(1.9) \times \sigma_t = \frac{2}{3} \times 1.9 \times 0.853$ ksi ✓ — 2

$K_{IR} = 2K_{I_m} + K_{I_t} = 2 \times 9.199 \times 1.9\ P + \frac{2}{3} \times 1.9 \times 0.853$ ✓
$= 34.96P + 1.08$ — 2

BUT $K_{IR} \approx 26.78 + 1.233\, e^{[0.0145(T - RT_{NDT} + 160)]}$ ✓

$\frac{K_{IR} - 26.78}{1.233} = e^{[0.0145(T - RT_{NDT} + 160)]}$

$0.0145(T - RT_{NDT} + 160) = \ln\left[\frac{K_{IR} - 26.78}{1.233}\right]$ ✓

$T - RT_{NDT} = \frac{1}{0.0145} \ln\left[\frac{K_{IR} - 26.78}{1.233}\right] - 160$ ✓

$= \frac{1}{0.0145} \ln\left[\frac{34.96P + 1.08 - 26.78}{1.233}\right] - 160$ ✓

CONFORMANCE WITH NDT REQ. OF ASME SECT. III, APP. G | REF.

$$T - RT_{NDT} = \frac{1}{0.0145} \ln\left[\frac{34.96P - 25.70}{1.233}\right] - 160$$

$RT_{NDT} = 70°$ [REF 1 BELOW]

| P | $T - RT_{NDT}$ | $T_{ALLOWABLE}$ | $T_{ACTUAL}$ (REF 3) |
|---|---|---|---|
| 1065 | -5.81 ✓ | 64.19°F | 101 °F |
| 1145 | 9.16 ✓ | 79.16°F | 91°F |
| 1100 | 1.14 ✓ | 71.14°F | 90°F |
| 940 | -38.66 ✓ | 31.34 °F | 88°F |

CONCLUSION :- SINCE $T_{ALLOWABLE} < T_{ACTUAL}$, REQUIREMENTS OF REF 2 ARE SATISFIED.

REFERENCES

1. LETTER, J. P. MADGETT, DPC, TO A. GIAMBUSSO, NRC, DATED JULY 7, 1975, LETTER No. LAC 3221.
2. ASME CODE SECTION III, APPENDIX G
3. TELECOPY, GOODMAN, DPC TO FINNAN, NES, 12/31/81