November 20, 1979

MINUTES OF LOFT L3-1 STATUS MEETING

A meeting was held in Lynchburg, Virginia on November 20, 1979, between representatives of Babcock and Wilcox and the NRC. The purpose of the meeting was to establish, to the extent practicable, Babcock and Wilcox's plan to perform a blind calculation of the LOFT L3-1 experiment. The L3-1 experiment is currently scheduled for November 20, 1979. Since the pre-test analysis has not been completed, this meeting was held to determine the current status and proposed methods to complete the calculation. The meeting attendees are listed in Appendix A.

The current status of the B&W calculation is described in a handout provided to the staff at the meeting. This handout is attached as Appendix B, "Preliminary CRAFT 2 Model of LOFT L3-1 Experiment," by N. K. Savani, dated November 20, 1979. This handout contains the following information:

1. A nodal diagram and description of each node.
2. An identification of the CRAFT computer program used for the analyses. Version 9.3 (Tape #10792) was used and is similar to the NRC-approved small break version (8.4) with the exception that the pump model has been modified to account for the special LOFT pump characteristics.
3. A description of significant input assumptions, which are also identified in the input listing.
4. A printout of the CRAFT L3-1 input listing.
5. A discussion of current B&W concerns with the current model. These items will be evaluated further by B&W, and may be changed in the final B&W analysis of L3-1. If changes are made to the current model, B&W will identify and justify each change.
6. Potential areas for model changes as identified to date are discussed in Appendix B and include:

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a) Break flow model comparison with Wyle test data

b) Secondary node pressure response to model actual LOFT test conditions

c) Accumulator discharge model and system response.

d) Steam generator heat transfer model.

Babcock and Wilcox stated that the L3-1 analysis had been completed to approximately 750 seconds. A microfiche of the computer output and several typical computer plots of the output were provided to the NRC. This output represents B&W's base calculation, and any modifications resulting from evaluation of the above concerns will be referenced to this calculation. This calculation was performed on November 14-15, 1979.

B&W noted that they had requested, via telecon, various information from EG&G-Idaho concerning the L3-1 experiment. The information was provided orally, and was to be transmitted in writing. Thus far, B&W has not received written confirmation of this information, nor any other special test information that may have been requested by other L3-1 pre-test participants.

Paul Norian
USNRC

Henry Bailey
Babcock and Wilcox

NOTE: B&W intends to justify as reasonable each change to our model from this date. As some changes may be subjective, B&W reserves the right to change and accepts the consequences which may result.

APPENDIX A

Babcock and Wilcox/NRC Meeting to Discuss LOFT L3-1 Status

Lynchburg, Virginia - 11/20/79

Jack Guttmann	NRC/DSS
Paul Norian	NRC/DSS
N. K. Savani	B&W
C. G. Motloch	Energy, Inc.
H. A. Bailey	B&W

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Appendix B

PRELIMINARY CRAFT2 MODEL OF LOFT L3-1 EXPERIMENT

Presented to

PAUL NORIAN & JACK GUTTMANN

November 20, 1979

by

N. K. SAVANI

Reviewed by: Chester G. Motloch
Chester Motloch

COMPUTER CODE USED:

CRAFT2, Version 9.3 with LOFT pump dated 4/7/77, Tape #10792.

NODAL ARRANGEMENT:

A noding diagram of the CRAFT2 computer model is shown in Figure 1 and described in Table 1. The model has 18 nodes and 36 flow paths. Throughout the model, dual flow paths are used to allow for counter-current flow. The secondary side is connected to the containment node to simulate the steam flow to the atmosphere.

BUBBLE RISE MODEL:

The Wilson bubble rise velocity model is used in all of the primary system nodes. A multiplier of 2.38 is used in the core node and 2.0 in the remainder of the vessel node. This approach is consistent with the B&W evaluation model. The secondary side of the SG has a steam separator, hence a large bubble rise velocity is utilized to allow for complete phase separation.

DISCHARGE MODEL:

Leak flow area = 0.002214 ft^2

Leak flow paths = 32 & 33

The Bernoulli-Moody discharge model with C_D = 0.6

STEAM GENERATOR:

Steam generator primary side is represented by two nodes and the secondary side with one node. The steam path from the secondary side of the steam generator, path 36, is open at the time of the reactor trip and starts closing at the rate of 5% position per second. An effective steady-state flow area was calculated based on the Moody critical flow model. The effective flow area was changed as a function of secondary side pressure consistent with the given steam flow control valve response characteristics.

PUMP MODEL:

The CRAFT2 pump input was modified to model the actual pump characteristic of that utilized in the experiment.

ECCS MODEL:

The ECCS is comprised of one accumulator (core flood tank), one high pressure injection system, and one low pressure injection system. The injection point is the intact loop cold leg piping. The ECCS actuation and performance characteristics are consistent with the initial conditions for this experiment.

CORE MODEL:

Single node.

Heat generation based on the given decay heat curve.

Table 1. Node Description

Node No.	Description
1	Downcomer annulus
2	Downcomer
3	Lower plenum
4	Core
5	Upper plenum & upper head
6	Pressurizer
7	Hot leg, intact loop
8	Steam generator, front half of primary side, intact loop
9	Steam generator, back half of primary side, intact loop
10	Steam generator outlet, cold leg piping, intact loop
11	Pump suction, intact loop
12	Pump discharge, intact loop
13	Hot leg plus half simulated SG, broken loop
14	Half simulated SG plus half pump, broken loop
15	Half pump plus piping, broken loop
16	Leak node
17	Suppression tank
18	Secondary side, intact loop

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OUTSTANDING CONCERNS

The following are areas of concerns and possible model changes. More sensitivity studies will be done before running the final case.

1. Evaluate the Bernoulli-Moody discharge model with C_D of 0.6 against the Wyle test prediction.

2. Evaluate the secondary system pressure response with additional steam control valve modeling studies. Also, evaluating the CRAFT2 small leak steam generator model.

3. Perform sensitivity studies to evaluate the accumulator model, if deemed necessary.

PDS-21037

GENERAL CALCULATIONS

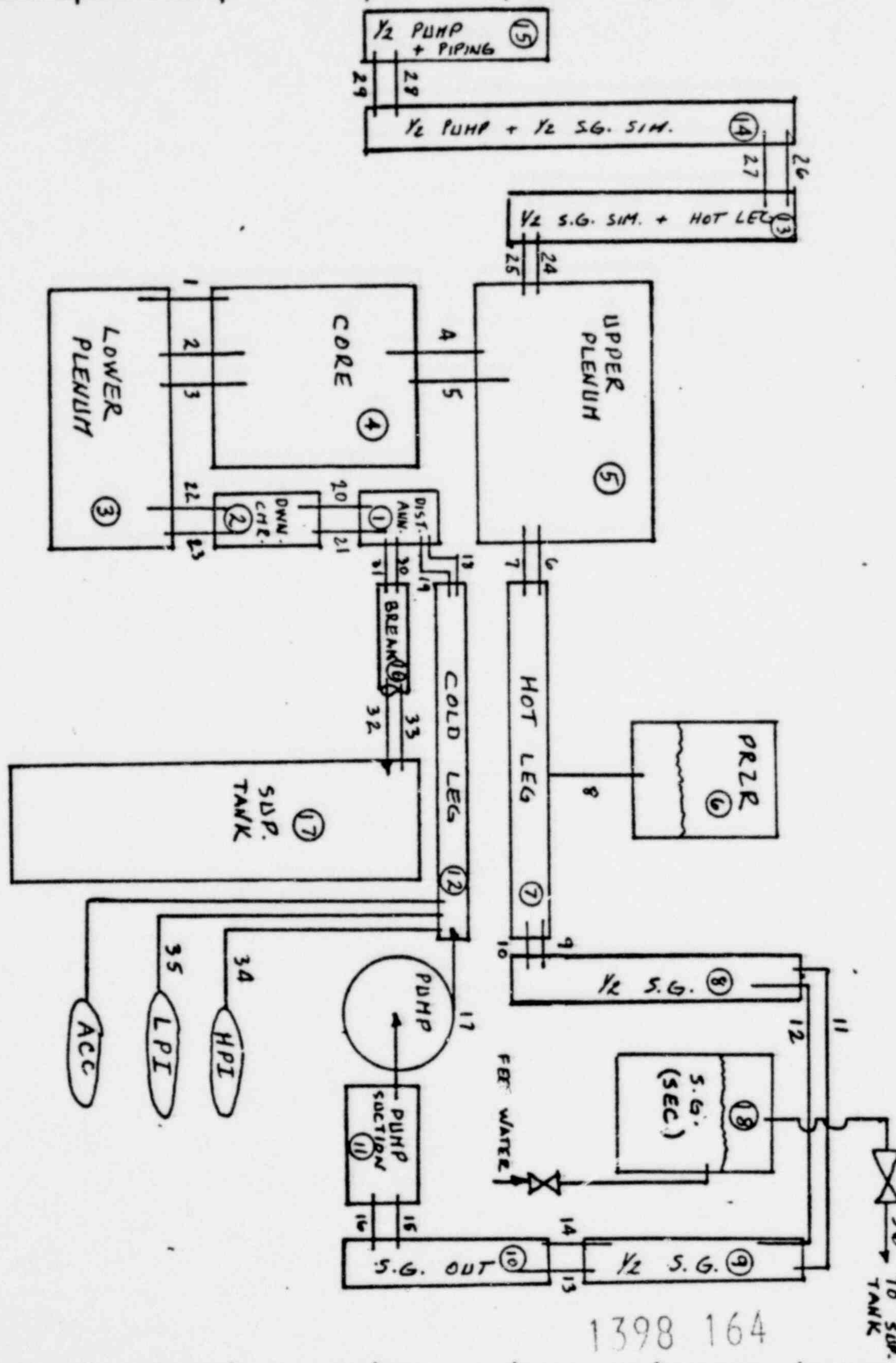

FIG. 1. LOFT L3-1 NODE DIAGRAM.

NODE (16) Leak node
Flowpaths 32 & 33 are leak flow paths

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CUSTOMER	PROP NO. / CONT. NO.
SUBJECT	DWG NO. / FILE NO.
	COMP. NO. / GROUP NO.
CALC. BY / DATE / CHK'D BY / DATE	SHEET NO.

PRELIMINARY PREDICTION OF L3-1

Time	Event
0.0	Experiment initiated
5.0	HPIS initiation
17.0	Pump decoupled
∿24.0	Pressurizer empty
∿30.0 (572.96°F)	Peak cladding temperature, °F
32.0	Saturation pressure at upper plenum
60	Auxiliary feedwater starts

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$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
LIST09W  KIBLER BG              11/19/79  17.24.39. CYBER  C

L31S1,T7777,STMFZ.              SAVANI NK
CHARGE.AH001A19,SAVANI NK,394,P,CRAFT2.
TITLE(LOFT PRETEST PREDICTION OF L3-1,CALC. 32-1106463-00)
DISPOSE(OUTPUT,*FR)
REQUEST,TAPE7,A4,*PF.
REQUEST,TAPE10,*PF.
REQUEST,TAPE77,*PF.
STAGE(TAPE,VSN=10792,PE)
LABEL(TAPE,R,L=PUMPMODEL)
COPYBF(TAPE,CRAFT2)
RETURN(TAPE)
STAGE(RTAPE,PE,POST,VSN=12101)
LABEL(RTAPE,W,L=L31NK,T=999)
STAGE(PTAPE,PE,POST,VSN=07199)
LABEL(PTAPE,W,L=L31NK,T=999)
STAGE(OTAPE,PE,POST,VSN=08748)
LABEL(OTAPE,W,L=L31NK,T=999)
REWIND(CRAFT2)
COPYBF(CRAFT2,TAPE77)
EXIT(C)
CRAFT2(FL=500000)
EXIT(U)
REWIND(TAPE77)
COPYBF(TAPE77,RTAPE,2)         (RESTART TAPE)
RETURN(RTAPE)
PURGE(TAPE77)
RETURN(TAPE77)
EXIT(U)
REWIND(TAPE7)
COPYBF(TAPE7,PTAPE)         (PLOT TAPE)
RETURN(PTAPE)
PURGE(TAPE7)
RETURN(TAPE7)
EXIT(U)
REWIND(TAPE10)
COPYCF(TAPE10,OUTPUT,100)
REWIND(OUTPUT)
COPYBF(OUTPUT,PAPER,100)
DISPOSE(PAPER,*PR)
REWIND(TAPE10)
COPYBF(TAPE10,OTAPE,100)
RETURN(OTAPE)
PURGE(TAPE10)
     1MOTLOCH   L31BASECAS                  00FR        LOFT L3-1 BASE CASE
    * LOFT L3-1 BASE CASE
    * BASE CASE
    * TRANSIENT
    * PLOT PACKAGE
    * PUMP HEAD SET TO 332.0 FT.
    * INPUT CA
    * AUXILIARY FEED WATER MODELED USING CARD SERIES 7211
    * 1/3 2/3 STEAM GENERATOR SPLIT
    * CORRECTED BUBBLE RISE INPUT
    * FUEL AVERAGE TEMPERATURE READJUSTED
    * STEAM FLOW CONTROL VALVE MODELED WITH CARD SERIES 4951
    * 40 HOUR OPERATION DECAY HEAT CURVE
    * ONB TURNED OFF
    * LPI INITIATES AT 144.7 PSIA
    90, 4
    *
    * RESTART INFORMATION
```

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```
101,  2.0
1001,     20.0,   0.0,    0.0
1004, 5.00, 5.00, 5.00
*
* PLOT INFORMATION
*
*       ID     X    MIN    MAX    SCALE   Y    MIN    MAX    LENGTH    X4    X5
*
* NODES
*
1501,  1105,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1502,  1106,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1503,  1107,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1504,  1112,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1505,  1113,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1506,  1116,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1507,  1118,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1508,  1201,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1509,  1202,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1510,  1203,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1511,  1204,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1512,  1205,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1513,  1206,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1514,  1208,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1515,  1209,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1516,  1210,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1517,  1218,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1519,  1309,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1529,  1618,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1531,  1802,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   11,  12
1532,  1803,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   10,  11
1533,  1804,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,    7,   5
*
* FLOW PATHS                                              1398 167
*
1534,  2101,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1539,  2109,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1540,  2110,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1542,  2118,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1543,  2119,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1545,  2125,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1546,  2132,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1552,  2403,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1556,  2717,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
* CORE PATHS
*
1557,  3101,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1559,  3201,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1562,  3302,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1563,  3501,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1566,  3602,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1567,  3801,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1568,  3802,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
*
* STEAM GENERATOR
*
1569,  4101,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1570,  4301,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1571,  4401,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1572,  4501,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1573,  4701,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
*
* FLOOD TANKS
*
1574,  5101,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1575,  5201,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1576,  5301,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
1577,  5801,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
*
* MISC
*
1578,  5401,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1582,  7107,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1593,  7208,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
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1600,  1211,  1,  0.0,  0.0,  10.0,  1,  0.0,  0.0,  10.0,   00,  00
*
* PLOT SELECTION INFORMATION
*
1601,  1105,  1604,  2132,  5601,  7204,  2717
*
1701,  100
*
```

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```
2001,0.0001,10.,20.,0.0005,100.,18.,0.001,500.,8.
*
* CONTROL VOLUMES
*
3001, 2.422, 2.477, 20.661, 22.000, 20.611,2198.77,538.03,0.0
3002, 1.451,12.574,  8.087, 20.561,  8.037,2193.88,538.03,0.0
3003, 6.113, 4.109,  9.694,  7.987,  5.635,2197.07,538.03,0.0
3004, 1.988, 5.583, 15.278,  9.794,  9.744,2189.42,582.92,0.0
3005, 3.284,10.256, 22.000, 15.378, 15.328,2178.56,582.92,0.0
3006, 6.040, 5.702, 26.298, 26.298, 26.248,2168.30,  0.0 ,3.71
3007,11.650, 0.932, 22.000, 22.000, 21.534,2170.70,582.92,0.0
3008, 2.482,10.909, 32.393, 22.000, 21.534,2159.25,560.43,0.0
3009, 2.430,10.532, 22.498, 32.393, 21.911,2148.25,538.03,0.0
3010, 0.882, 5.021, 18.257, 22.498, 17.791,2135.46,538.03,0.0
3011, 2.327, 4.675, 22.000, 18.257, 17.791,2134.31,538.03,0.0
3012,16.191, 0.932, 22.0  , 22.0  , 21.534,2199.66,538.03,0.0
3013, 1.983,11.109, 32.041, 22.0  , 21.534,2176.24,538.03,0.0
3014, 0.773,15.088, 18.021, 32.041, 17.555,2176.24,538.03,0.0
3015, 0.560, 4.860, 22.0  , 18.021, 17.563,2179.60,538.03,0.0
3016, 4.120, 2.920, 22.0  , 22.0  , 21.534,2198.33,538.03,0.0
3017,23710.,15.600, 22.0  , 11.49 ,  8.490,  30.00,  0.0 ,4.17
3018,14.630,18.860, 44.01 , 34.23 , 25.62 , 750.00,  0.0 ,10.5
*
* PRIMARY METAL HEAT TRANSFER COEFFICIENTS
*
3510,  1.4,  .00055
*
* PRIMARY METAL TIME STEPS
3511,  0.1,  15.0,  .001,  1.+6
*
* PRIMARY METAL PROPERTIES
*
*      VOL  H.T.AREA  THICK    CLAD T     BULK K   CLAD K   RHO CP   T-INC
3521,  1,    47.18,  0.51,    0.01042,   24.00,   10.99,   53.30,   0.0
3522,  1,    61.09,  0.842,   0.842,     10.99,   10.99,   62.90,   0.0
3523,  1,    21.40,  0.125,   0.125,     10.99,   10.99,   62.90,   0.0
3524,  2,   189.94,  0.399,   0.01042,   24.00,   10.99,   53.30,   0.0
3525,  2,   310.09,  0.842,   0.842,     10.99,   10.99,   62.90,   0.0
3526,  2,   108.63,  0.125,   0.125,     10.99,   10.99,   62.90,   0.0
3527,  3,    24.36,  0.325,   0.01042,   24.00,   10.99,   53.30,   0.0
3528,  3,    28.34,  0.842,   0.842,     10.99,   10.99,   62.90,   0.0
3529,  3,    64.00,  0.0449,  0.0449,    10.99,   10.99,   62.90,   0.0
3530,  4,    35.02,  0.254,   0.254,     10.99,   10.99,   62.90,   0.0
3531,  5,   973.0,   0.010,   0.010,     10.99,   10.99,   62.90,   0.0
3532,  5,    64.10,  0.254,   0.254,     10.99,   10.99,   62.90,   0.0
3533,  7,    50.09,  0.140,   0.140,     10.99,   10.99,   64.11,   0.0
3534,  8,    29.673, 0.267,   0.0208,    24.00,   10.8,    53.30,   0.0
3535,  8,  1449.8,   0.00204,0.00204,    10.8,    10.8,    55.16,   0.0
3536,  9,  1449.8,   0.00204,0.00204,    10.8,    10.8,    55.16,   0.0
3537,  9,    29.673, 0.267,   0.0208,    24.0,    10.8,    53.30,   0.0
3538, 18,  3610.0,   0.00204,0.00204,    10.8,    10.8,    55.16,   0.0
3539, 18,   312.21,  0.0625,  0.0625,    24.0,    24.0,    53.30,   0.0
3540, 18,   268.03,  0.18,    0.18,      24.0,    24.0,  - 53.30,   0.0
3541, 18,    12.07,  0.479,   0.0[illegible],  24.0,    10.8,    53.30,   0.0
3542, 10,    18.51,  0.135,   [illegible],     10.99,   10.99,   64.11,   0.0
3543, 11,    34.66,  0.125,   [illegible],     10.99,   10.99,   64.11,   0.0
3544, 12,    49.52,  0.129,   [illegible].129, 10.99,   10.99,   64.11,   0.0
3545,  6,    11.01,  0.0293,  0.0293,    10.99,   10.99,   64.11,   0.0
3546,  6,    65.95,  0.2711,  0.0208,    24.0,    10.99,   53.30,   0.0
3547, 13,   127.82,  0.098,   0.098,     10.99,   10.99,   64.11,   0.0
3548, 14,    88.17,  0.093,   0.093,     10.99,   10.99,   64.11,   0.0
3549, 15,    13.67,  0.046,   0.046,     10.99,   10.99,   64.11,   0.0
3550, 16,    54.96,  0.092,   0.092,     10.99,   10.99,   64.11,   0.0
*
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3801,17,32,33
*
* WILSON MULTIPLIER TABLE
*
3890,    2.0,    0.0,    2.0,   1.+6
3891,    2.0,    0.0,    2.0,   1.+6
3892,    2.0,    0.0,    2.0,   1.+6
3893,    2.38,   0.0,    2.38,  1.+6
3894,    2.0,    0.0,    2.0,   1.+6
*
* BUBBLE RISE VELOCITY
*
3901, 1,-887.0, 2,-887.0, 3,-887.0, 4,-887.0, 5,-887.0, 6,-888.0
3902, 7,-888.0, 8,-888.0, 9,-888.0,10,-888.0,11,-888.0,12,-888.0
3903,13,-888.0,14,-888.0,15,-888.0,16,-888.0,17,-888.0,18,1000.0
*
* HYDRAULIC DIAMETER FOR WILSON MODEL
*
3905, 1,0.292, 2,0.167, 3,0.035, 4,0.0402, 5,1.307, 6,2.783, 7,0.932
3906, 8,0.034, 9,0.034,10,0.932,11,0.9320,12,0.932,13,0.932,14,0.058
3907,15,0.338,16,0.932,17,1.938,18,4.316
*
* REGULAR FLOW PATHS
*
4001, 1, 3, 4,501.39, 6.884,0.828, 0.0 ,-1.44-4,0.,0.100,0.0,0.0402
4002, 1, 3, 4,501.39, 6.884,0.828, 0.0 ,-1.44-4,0.,0.100,0.0,0.0402
4003, 8, 3, 4, 52.78,228.11,0.025, 0.0 ,-1.30-2,0.,0.1  ,0.0,0.178
4004, 8, 4, 5,527.78, 7.062,1.340, 0.0 ,-1.02-4,0.,0.1  ,0.0,1.306
4005, 8, 4, 5,527.78, 7.062,1.340, 0.0 ,-1.02-4,0.,0.1  ,0.0,1.306
4006, 8, 5, 7,527.78,29.10 ,0.361, 0.0 ,-6.86-4,0.,0.466,0.0,0.932
4007, 8, 5, 7,527.78,29.10 ,0.361, 0.0 ,-6.86-4,0.,0.466,0.0,0.932
4008, 5, 6, 7,  0.0 ,1384.2,0.018, 7.6 ,-2.28-4,0.,0.1  ,1.0-8,.141,.99
4009, 8, 7, 8,527.78,37.540,0.451, 0.0 ,7.625-4,0.,0.1  ,0.0,0.0335
4010, 8, 7, 8,527.78,37.540,0.451, 0.0 ,7.625-4,0.,0.1  ,0.0,0.0335
4011, 8, 8, 9,527.78, 8.521,0.814, 0.0 ,  0.0  ,0.,0.479,0.0,0.0335
4012, 8, 8, 9,527.78, 8.521,0.814, 0.0 ,  0.0  ,0.,0.479,0.0,0.0335
4013, 8, 9,10,527.78,12.528,0.746, 0.0 ,-7.63-4,0.,0.100,0.0,0.0335
4014, 8, 9,10,527.78,12.528,0.746, 0.0 ,-7.63-4,0.,0.1  ,0.0,0.0335
4015, 8,10,11,527.78,18.922,0.341, 0.0 ,  0.0  ,0.,0.466,0.0,0.932
4016, 8,10,11,527.78,18.922,0.341, 0.0 ,  0.0  ,0.,0.466,0.0,0.932
4017, 2,11,12,1055.6, 8.874,1.075, 0.0 ,  0.0  ,0.,0.708,0.0,0.932
4018, 8,12, 1,527.78,36.546,0.366, 0.0 ,8.699-4,0.,0.466,0.0,0.932
4019, 8,12, 1,527.78,36.546,0.366, 0.0 ,8.699-4,0.,0.466,0.0,0.932
4020, 8, 1, 2,527.78,10.241,0.704, 0.0 ,1.295-4,0.,0.1  ,0.0,0.292
4021, 8, 1, 2,527.78,10.241,0.704, 0.0 ,1.295-4,0.,0.1  ,0.0,0.292
4022, 8, 2, 3,527.78,10.055,0.890, 0.0 ,1.772-4,0.,0.1  ,0.0,0.167
4023, 8, 2, 3,527.78,10.055,0.890, 0.0 ,1.772-4,0.,0.1  ,0.0,0.167
4024, 8,13, 5, 0.0  ,52.568,0.180,1.003,6.856-4,0.,0.466,1.0-8,.479
4025, 8,13, 5, 0.0  ,52.568,0.180,1.003,6.856-4,0.,0.466,1.0-8,.479
4026, 8,14,13, 0.0  ,106.75,0.208,12.56,-5.92-4,0.,0.602,1.0-8,.515
4027, 8,14,13, 0.0  ,106.75,0.208,12.56,-5.92-4,0.,0.602,1.0-8,.515
4028, 8,15,14, 0.0  ,112.37,0.067, 4.56,0.05290,0.,0.458,1.0-8,.292
4029, 8,15,14, 0.0  ,112.37,0.067, 4.56,0.05290,0.,0.458,1.0-8,.292
4030, 8, 1,16, 0.0  , 16.31,0.396, 5.67,-8.70-4,0.,0.466,1.0-8,.710
4031, 8, 1,16, 0.0  , 16.31,0.396, 5.67,-8.70-4,0.,0.466,1.0-8,.710
*
* LEAK FLOW PATHS
*
4232, 7,16,17,0.0,0.0010,0.002214,0.60,-1.0,0.053
4233, 7,17,16,0.0,0.0010,0.002214,0.60,-1.0,0.053
*
* FILL SYSTEM
*
4434,6,1,12,0,1.0,43.09,0.0
4435,6,2,12,0,1.0,43.09,0.0
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4036, 10, 18, 17, 58.5, 100.0, .038487,2.4359,0.0,0.0,0.1,1.-8,0.22,1.0
*
* INTEGRATED FLOW PATH MASS
*
4601,1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
4602, 21,  22,  23,  24,  26,  28,  30,  31,  32,  33
4810,  36
*
* FLOW PATH ELEVATION MODIFICATIONS
*
*       PATH   UP.ELEV   DN.ELEV
4901,    1,    9.584,    9.804
4902,    2,    9.684,    9.904
4903,    3,    9.684,    9.904
4904,    4,   15.168,   15.388
4905,    5,   15.268,   15.488
4906,    6,   22.232,   22.232
4907,    7,   21.768,   21.768
4908,    9,   22.232,   22.232
4909,   10,   21.768,   21.768
4910,   11,   31.964,   31.964
4911,   12,   31.006,   31.006
4912,   13,   22.873,   22.653
4913,   14,   22.973,   22.753
4914,   15,   18.490,   18.490
4915,   16,   18.025,   18.025
4916,   18,   22.232,   22.232
4917,   19,   21.768,   21.768
4918,   20,   20.671,   20.451
4919,   21,   20.771,   20.551
4920,   22,    8.097,    7.877
4921,   23,    8.197,    7.977
4922,   24,   22.232,   22.232
4923,   25,   21.768,   21.768
4924,   26,   32.341,   32.341
4925,   27,   31.740,   31.740
4926,   28,   18.106,   18.106
4927,   29,   17.936,   17.936
4928,   30,   22.232,   22.232
4929,   31,   21.768,   21.768
4930,    8,   26.298,   22.416
*
* STEAM FLOW CONTROL CONTROL VALVE
*
4951,     0.038487,  0.0,     0.0,  15.0,0.0,1.+6
*
* CORE PARAMETERS
*
5001,0.0402,5.5,7500.,3000.0,10.,3,2.15969+5,394.96,1.,-9.8-5,1.,1.,
+     1.,1.,0.0,0.0,0
5002,0.0402,5.5,7500.,3000.0,10.,3,2.15969+5,394.96,1.,-9.8-5,1.,1.,
+     1.,1.,0.0,0.0,0
*
* FUEL PIN,GAP AND CLADDING PROPERTIES
*
5101,0.0152, 0.0 , 0.0,1835.0,0.0003125,-1.,-1.,0.00203,0.0,0.0,0.0,
+     0.0,0.0,1,55.0
5102,0.0152, 0.0 , 0.0,1835.0,0.0003125,-1.,-1.,0.00203,0.0,0.0,0.0,
+     0.0,0.0,2,55.0
*
* FUEL PIN FUEL DENSITY
*
5500,636.92
*
* POISSON RATIO AND PIN PLENUM VOLUMES
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5505,0.35,0.0,1.56-4,1.,0.2,0.0153,2
*
* UPPER AND LOWER PATHS FOR EACH CHANNEL
*
5510,1,1,1,2,2,2
*
* METAL-WATER REACTION CONSTANTS
*
5901,91.22,140.5,6.5,2.0,1.-5,1500.,45500.0,33.3,0.0
*
* DNB PARAMETERS
*
5921, 6.0+9, 1000.0, 1000.0, 2.75, 0.0
*
* SCRAM PARAMETERS
*
6001,  3.71,  0.0,  3000.0,  0.0,  0.0,  6,  6
*
* HEAT GENERATION VS TIME TABLE ... 40 HOUR OPERATION
*
6011, 1.0,            0.0,  0.059060,     1.0,  0.057404,     1.5
6012, 0.055963,       2.0,  0.051666,     4.0,  0.048779,     6.0
6013, 0.046640,       8.0,  0.044956,    10.0,  0.041893,    15.0
6014, 0.039756,      20.0,  0.034757,    40.0,  0.031888,    60.0
6015, 0.029900,      80.0,  0.028412,   100.0,  0.025868,   150.0
6016, 0.024201,     200.0,  0.020577,   400.0,  0.018552,   600.0
6017, 0.017087,     800.0,  0.015932,  1000.0,  0.013811,  1500.0
6018, 0.012315,    2000.0,  0.008993,  4000.0
* NORMALIZED HEAT TRANSFER COEFFICIENT VS TIME TABLE
*
7021,1.,0.0,1.,10000.0
7031,1.,0.0,1.,10000.0
*
* STEAM GENERATOR HEAT TRANSFER MODEL (OPTION 2)
*
7100,1,1
*
* STEAM GENERATOR
*
7101,9,  18,  15796.3,  31592.6,  40.13,  40.13,  58.5,  0.1
*
* STEAM GENERATOR LOGIC PARAMETERS
*
7201,1.+6,1.+6,60.0
*
* MAIN FEEDWATER COASTDOWN
*
*
7211,  0.0, 0.0,  0.0, 59.99,  1.11, 60.0,  1.11, 1500.0
* AUXILIARY FEEDWATER VS PRESSURE TABLE
*
7231,0.0,0.0,0.0,1.+6
*
* RELIEF VALVE ACTUATION PRESSURE VS TIME TABLE
*
7251,3000.0,0.0,3000.0,10000.0
*
* RELIEF VALVE CHARACTERISTICS
*
7271,0.0,0.0,0.0,10000.0
*
* SAFETY VALVE CHARACTERISTICS
*
7291,0.0,0.0,0.0,0.0
*
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*
8001,1, 2.42, 2.03, 1.82, 1.61, 1.48, 1.40, 1.35, 1.30, 1.21, 1.11, 1.00
8002,2, 1.00, 0.70, 0.47, 0.33, 0.28, 0.24, 0.13,-0.05,-0.30,-0.60,-1.00
8003,3,-1.00,-0.98,-0.94,-0.88,-0.79,-0.68,-0.51,-0.28, 0.0 , 0.40, 1.00
8004,4, 1.00, 0.85, 0.83, 0.85, 0.89, 0.93, 1.21, 1.29, 1.52, 1.92, 2.42
8005,5, 1.98, 1.40, 1.04, 0.80, 0.67, 0.60, 0.63, 0.73, 0.83, 0.91, 1.00
8006,6, 0.33, 0.21, 0.07,-0.26,-0.36,-0.47,-0.70,-0.92,-0.95,-0.98,-1.00
8007,7,-1.00,-0.98,-0.95,-0.92,-0.88,-0.68,-0.47,-0.26, 0.30, 0.63, 1.00
8008,8, 0.33, 0.53, 0.73, 0.93, 1.08, 1.25, 1.39, 1.52, 1.66, 1.81, 1.98
*
* PUMP ELECTRIC TORQUE VS ACTUAL PUMP SPEED
*
8016,350.8,0.0,350.8,3062.5
*
* PUMP SHUTDOWN PARAMETERS
*
8021,0.0,  1.-3,  0.0,  750.0,  0.0,  0.0,  0.0
*
* PUMP PARAMETERS
*
8031,17,332.0,455.59,3530.0,10000.0,0.738,3062.5
*
* PUMP MOTOR CONSTANTS
*
8041,0.003,14.455,152.994,0.0,0.0,972.694,386.971,-1777.01,
+    0.0,0.0,34.0,1.0
*
* FILL SYSTEM ACTUATION PARAMETERS
*
10001,0.0,1910.7,6,7
*
* FILL SYSTEM TIME DELAYS
*
10011,1.+6,0.0,1.+6
10012,1.+6,0.0,1.+6
*
* FILL FLOW VS BACK PRESSURE TABLE
*
10021,12.0,0.0,12.0,14.7, 5.0,1214.7, 5.0,3000.0
10026,110.5,0.0,110.5,14.7,68.0,144.7,0.0,145.0,0.0,3000.0
*
* FLOOD TANKS
*
10060,12,62.23,4741.93,59.62,42.8,615.0,2.5,125.1,13.06,560.6
10061,24.174,22.0,22.0,13.57,527.4,24.8,0.0645,0,0.0
*
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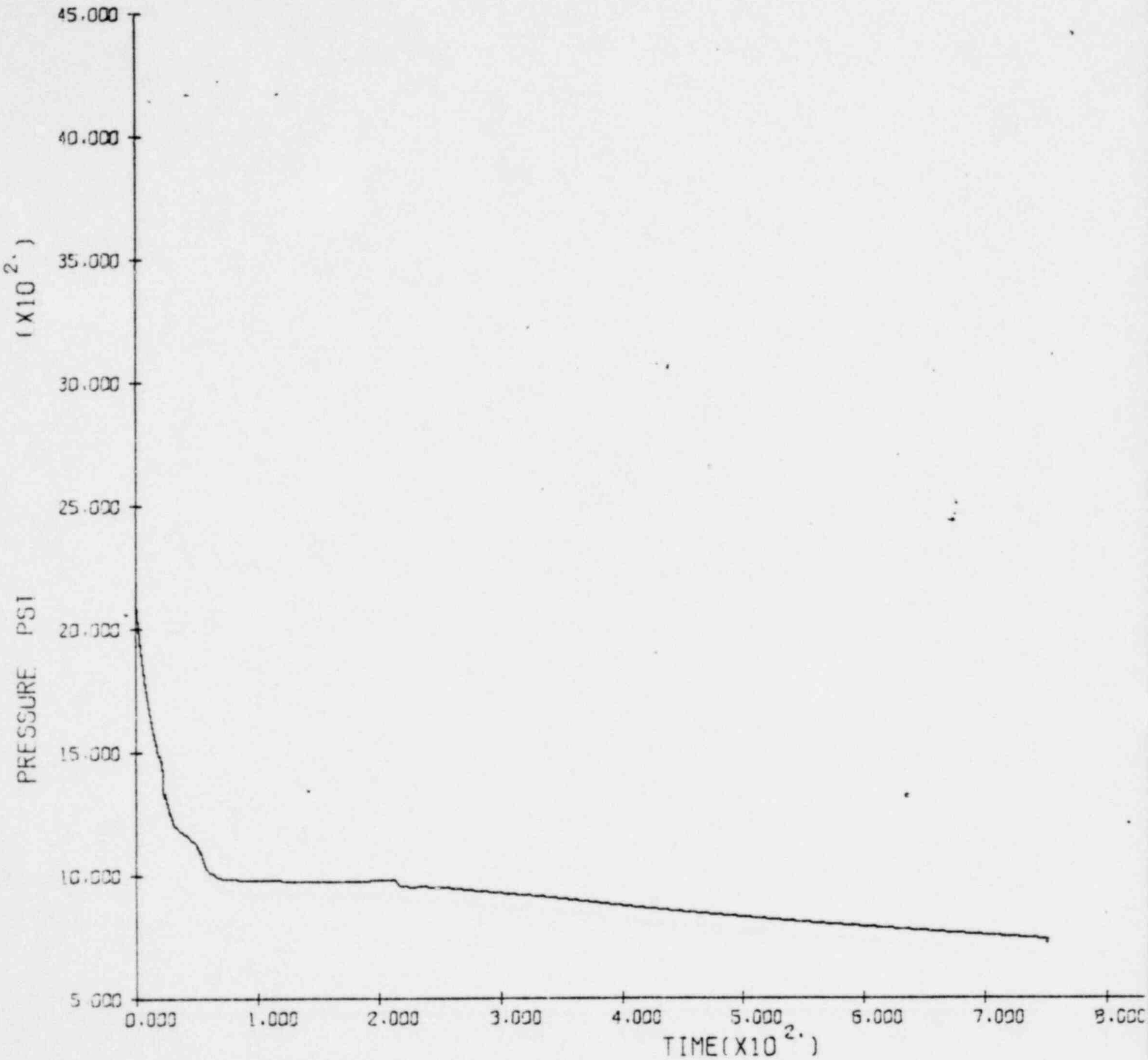
POOR ORIGINAL

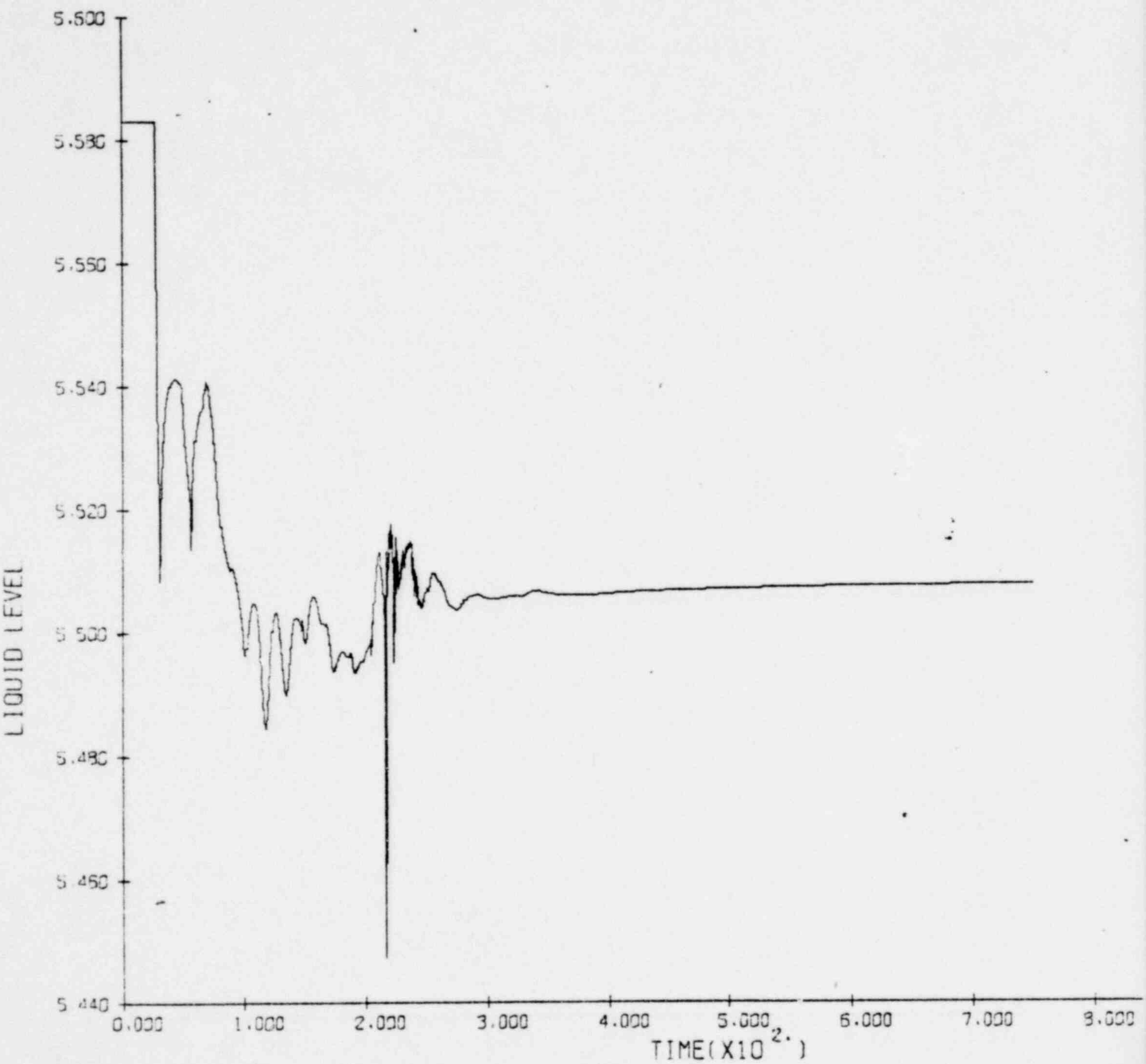


L31S2HK LOFT L3-1 PREDICTION

NODE 5

1398 174

POOR ORIGINAL

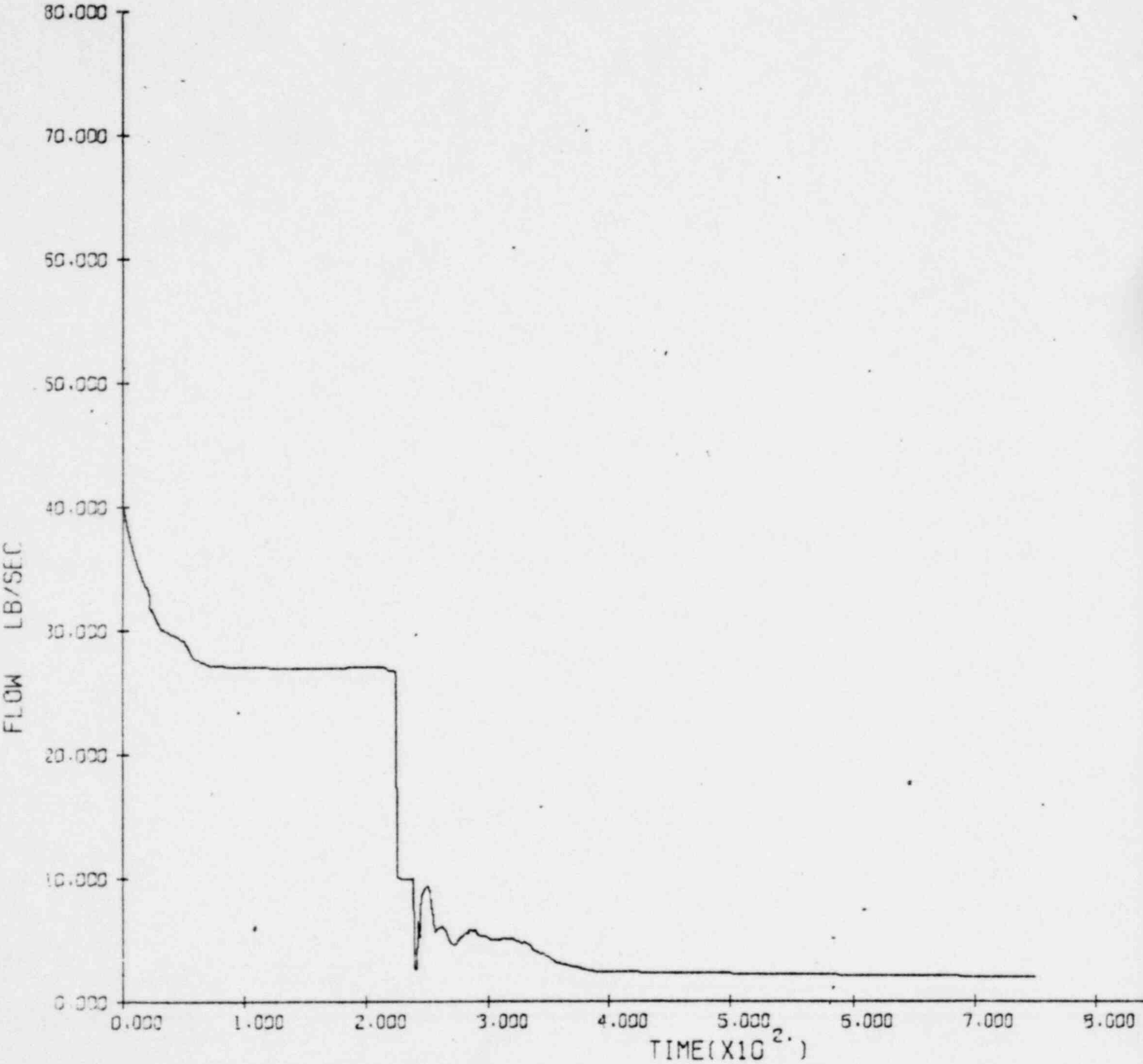


L31S2HK LOFT L3-1 PREDICTION

NODE 4

1398 175

POOR ORIGINAL

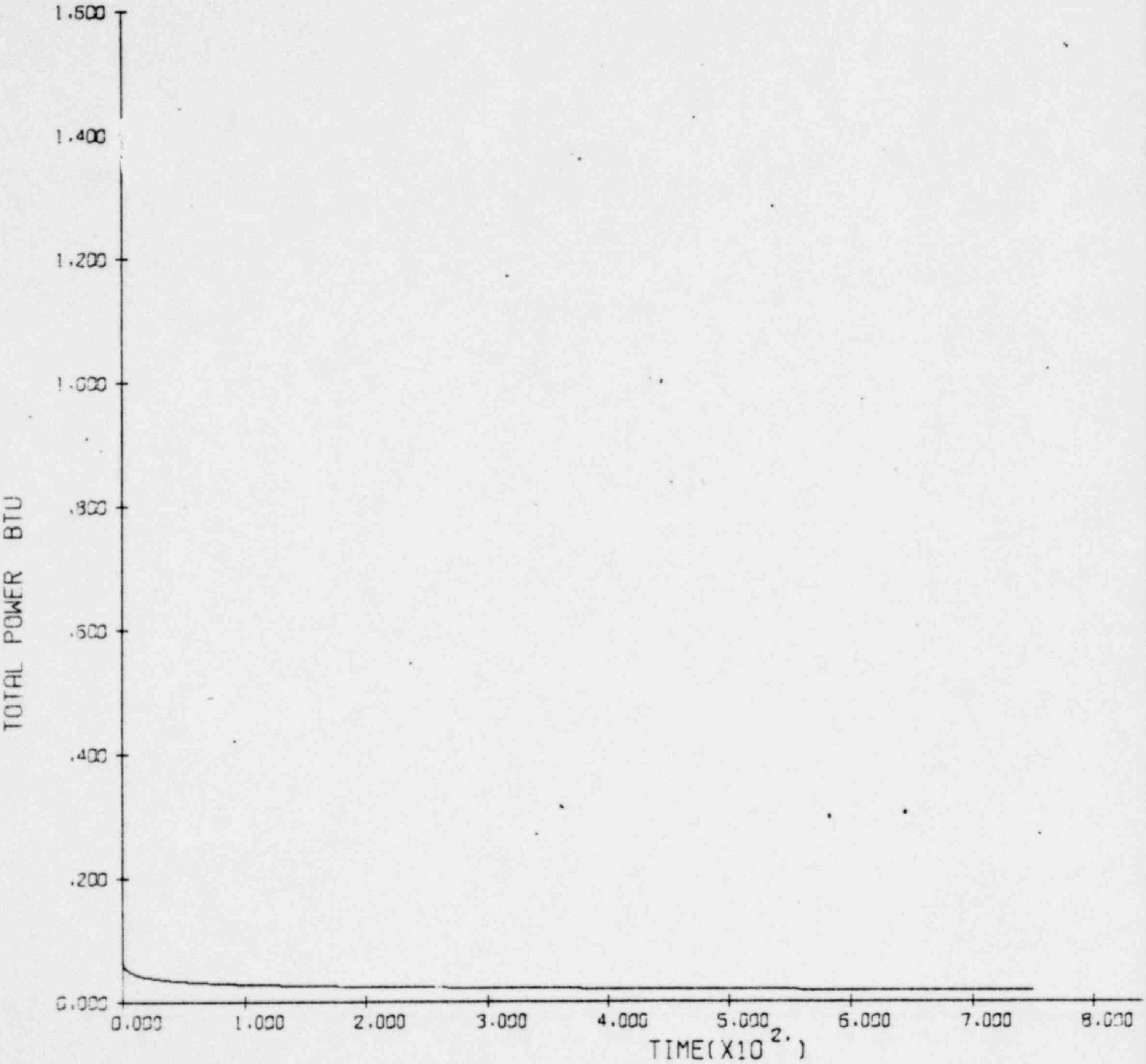


L31S24K LOFT L3-1 PREDICTION

PATH 32

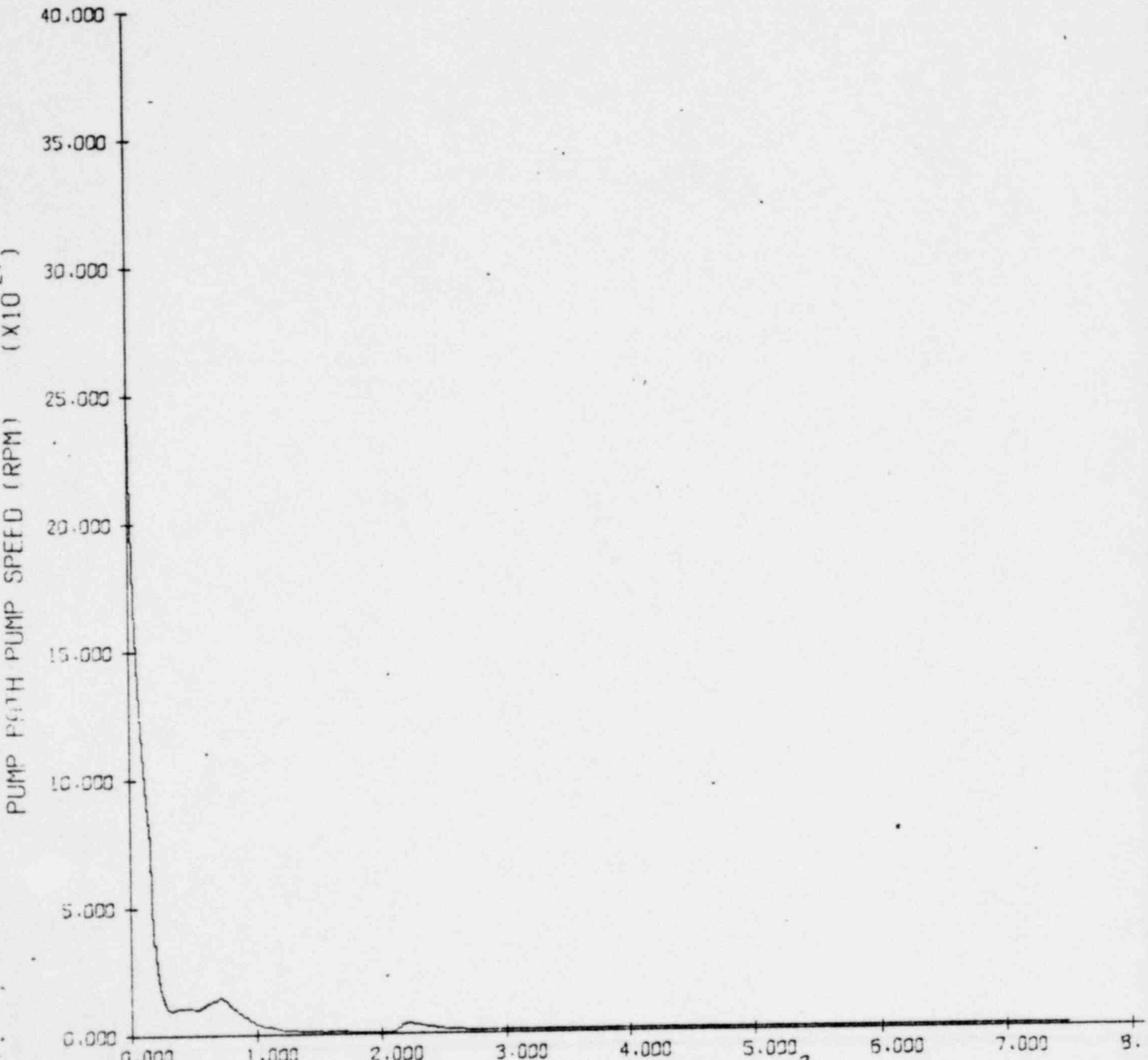
1398 176

POOR ORIGINAL



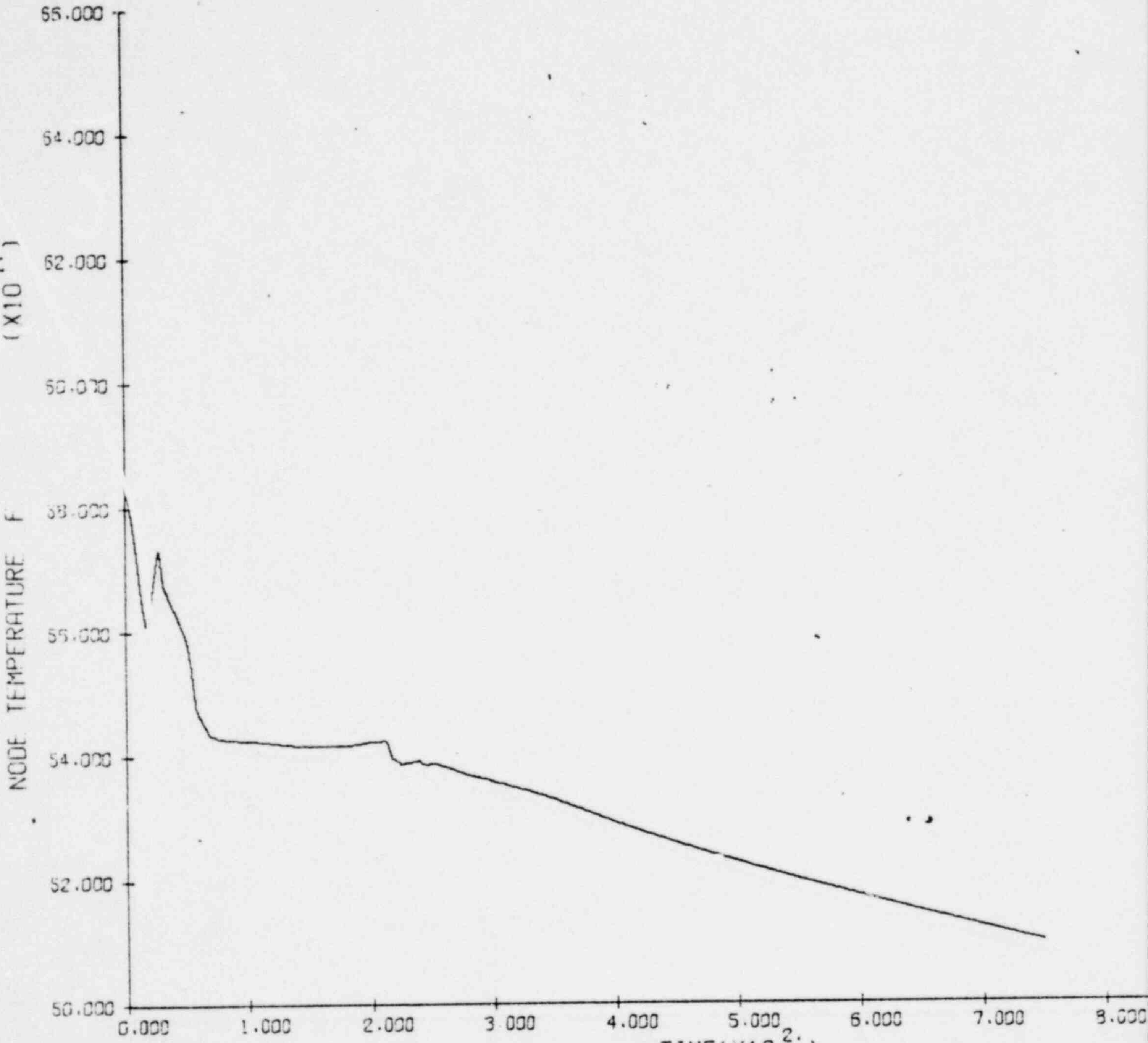
L31S2HK LOFT L3-1 PREDICTION

1398 177



L31S2HK LOFT L3-1 PREDICTION

PATH 17



L31S2HK LOFT L3-1 PREDICTION

NODE 4

1398 179