8.1.16 Card Series 701

Card Series 701 is a table that is used to apportion energy into the containment vapor region from the core decay heat table (card series 101) and energy from the metal-water reaction/sensible heat addition table (card series 201). The table also provides for the arbitrary addition of water mass to the containment atmosphere. The card series 701 table consists of decay heat multiplier and metal-water reaction multiplier, and a water mass flow rate in lb_m/hr versus time in seconds. A minimum of two data sets are required and a maximum of 20 data sets are permitted. The data are entered in the following order:

Time (seconds)
Decay Power Multiplier (dimensionless)
Metal-Water Reaction/Sensible Heat Multiplier (dimensionless)
Water Addition Rate (lb_m/hr)

The decay heat is all added to the reactor vessel water (Section 8.1.10, Card Series 101); therefore, the decay power multiplier in the 701 table is zero. The metal -water reaction energy is all added to the containment vapor region (Section 8.1.11, Card Series 201); therefore the metal -water reaction multiplier in the 701 table is 1.0 out through the end of the metal-water reaction energy interval. The fraction of the sensible heat addition which is input to the containment vapor region is a variable function of time as determined by 1 minus the sensible heat fraction input into the reactor vessel water (Section 8.1.13, Card Series 401). In the case of the hot leg LOCAs, no sensible heat is directly added to the containment vapor region, and the multiplier in the 701 table is zero. No direct addition of water to the containment vapor region, other than that associated with the containment spray which is added in Card Series 801; therefore the water addition rate value is zero in Card Series 701.

The Card Series 701 tabular input listing for each LOCA case is provided below.

Case 1, DEDLS LOCA w/DG Failure

```
$LIST POOL=701,      0,     0,     1,     0,
             2.20E2,     0,     1,     0,
             2.20E2,     0,     0,     0,
             3.11E2,     0,     0,     0,
             3.11E2,     0, 0.016,     0,
             5.13E2,     0, 0.014,     0,
             6.13E2,     0, 0.184,     0,
            1.013E3,     0, 0.225,     0,
            4.226E3,     0, 0.453,     0,
           1.0026E4,     0, 0.678,     0,
           1.9626E4,     0, 0.763,     0,
           4.2260E4,     0, 0.785,     0,
           9.4260E4,     0, 0.960,     0,
           1.9826E5,     0, 0.691,     0,
           2.9626E5,     0, 0.561,     0,
           5.3565E5,     0, 0.412,     0,
          1.03065E6,     0, 0.793,     0,
          2.01565E6,     0, 0.677,     0,
```

```
3.25065E6,     0,  0.642,     0,
1.00001E7,     0,  0.642,     0  $END
```

Case 2, DEDLS LOCA w/CS Train Failure

```
$LIST POOL=701,      0,     0,      1,     0,
             1.91E2,     0,      1,     0,
             1.91E2,     0,      0,     0,
             2.58E2,     0,      0,     0,
             2.58E2,     0,  0.026,     0,
            4.929E2,     0,  0.024,     0,
            4.979E2,     0,  0.196,     0,
            2.116E3,     0,  0.368,     0,
            4.916E3,     0,  0.524,     0,
           1.0116E4,     0,  0.742,     0,
           3.9160E4,     0,  0.846,     0,
           8.9160E4,     0,  0.815,     0,
           9.5160E4,     0,  0.987,     0,
           1.0116E5,     0,  0.927,     0,
           2.9716E5,     0,  0.517,     0,
           5.3790E5,     0,  0.382,     0,
           7.8790E5,     0,  0.626,     0,
          1.03290E6,     0,  0.819,     0,
          3.25290E6,     0,  0.634,     0,
          1.00001E7,     0,  0.634,     0 $END
```

Case 3, DEDLS LOCA w/ECU Train Failure

```
$LIST POOL=701,      0,     0,      1,     0,
             1.91E2,     0,      1,     0,
             1.91E2,     0,      0,     0,
             2.58E2,     0,      0,     0,
             2.58E2,     0,  0.026,     0,
            4.929E2,     0,  0.025,     0,
            4.979E2,     0,  0.181,     0,
            1.258E3,     0,  0.279,     0,
            4.916E3,     0,  0.560,     0,
           1.5116E4,     0,  0.806,     0,
           4.9160E4,     0,  0.852,     0,
           1.0116E5,     0,  0.918,     0,
           2.9716E5,     0,  0.528,     0,
           5.3790E5,     0,  0.327,     0,
          1.03290E6,     0,  0.739,     0,
          1.77290E6,     0,  0.731,     0,
          2.01790E6,     0,      0,     0,
          2.26790E6,     0,  0.764,     0,
          2.51290E6,     0,      0,     0,
          1.00001E7,     0,      0,     0 $END
```

Case 4, DESLS LOCA w/DG Failure

```
$LIST POOL=701,      0,     0,      1,     0,
            1.777E2,     0,      1,     0,
            1.777E2,     0,      0,     0,
             2.54E2,     0,      0,     0,
             2.54E2,     0,  0.079,     0,
            4.885E2,     0,  0.070,     0,
```

```
      4.935E2,    0,   0.506,    0,
      1.069E3,    0,   0.600,    0,
      2.938E3,    0,   0.697,    0,
     1.0138E4,    0,   0.836,    0,
     1.9738E4,    0,   0.868,    0,
     4.9380E4,    0,   0.864,    0,
     8.8380E4,    0,   0.837,    0,
     9.5380E4,    0,   0.990,    0,
     1.9938E5,    0,   0.759,    0,
     2.9738E5,    0,   0.613,    0,
     7.8845E5,    0,   0.703,    0,
    1.27845E6,    0,   0.686,    0,
    3.25345E6,    0,   0.634,    0,
    1.00001E7,    0,   0.634,    0 $END
```

Case 5, DESLS LOCA w/CS Train Failure

```
$LIST POOL=701,     0,    0,     1,    0,
             1.406E2,    0,     1,    0,
             1.406E2,    0,     0,    0,
              1.74E2,    0.     0,    0,
              1.74E2,    0,   0.094,  0,
             4.139E2,    0,   0.083,  0,
             4.189E2,    0,   0.480,  0,
             9.770E2,    0,   0.614,  0,
             4.954E3,    0,   0.723,  0,
            1.5154E4,    0,   0.890,  0,
            3.9540E4,    0,   0.904,  0,
            9.5540E4,    0,   0.993,  0,
            1.9954E5,    0,   0.782,  0,
            2.9754E5,    0,   0.588,  0,
            7.8885E5,    0,   0.636,  0,
           1.03385E6,    0,   0.820,  0,
           1.52885E6,    0,   0.655,  0,
           3.00885E6,    0,   0.776,  0,
           3.25385E6,    0,   0.736,  0,
           1.00001E7,    0,   0.736,  0 $END
```

Case 6, DESLS LOCA w/ECU Train Failure

```
$LIST POOL=701,     0,    0,     1,    0,
             1.406E2,    0,     1,    0,
             1.406E2,    0,     0,    0,
              1.74E2,    0,     0,    0,
              1.74E2,    0,   0.094,  0,
             4.139E2,    0,   0.083,  0,
             4.189E2,    0,   0.448,  0,
             1.577E3,    0,   0.592,  0,
             4.954E3,    0,   0.744,  0,
            1.5154E4,    0,   0.886,  0,
            3.9540E4,    0,   0.904,  0,
            9.5540E4,    0,   0.986,  0,
            1.9954E5,    0,   0.789,  0,
            2.9754E5,    0,   0.599,  0,
            5.3885E5,    0,   0.326,  0,
           1.03385E6,    0,   0.739,  0,
           1.27885E6,    0,   0.791,  0,
           1.77385E6,    0,   0.731,  0,
```

```
                2.26885E6,    0,      0,    0,
                1.00001E7,    0,      0,    0 $END
```

Case 7, DEHLS LOCA w/DG Failure

```
$LIST POOL=701,       0,      0,    1,    0,
                 1.22E1,      0,    1,    0,
                 1.22E1,      0,    0,    0,
               1.00001E7,     0,    0,    0 $END
```

Case 8, DEHLS LOCA w/CS Train Failure

```
$LIST POOL=701,       0,      0,    1,    0,
                 1.22E1,      0,    1,    0,
                 1.22E1,      0,    0,    0,
               1.00001E7,     0,    0,    0 $END
```

Case 9, DEHLS LOCA w/ECU Train Failure

```
$LIST POOL=701,       0,      0,    1,    0,
                 1.22E1,      0,    1,    0,
                 1.22E1,      0,    0,    0,
               1.00001E7,     0,    0,    0 $END
```

8.1.17 Card Series 801

Card Series 801 is a table which provides information on the characteristics of the containment spray system, the core safety injection system and source of water for these systems, all as a function of time. The series 801 table consists of 6 columns containing:

1. Time (seconds)
2. Containment spray flow rate (lb_m/hr); Design Input 4.12
3. Reactor vessel safety Injection water flow rate (lb_m/hr); Design Input 4.13
4. Fraction of the SI flow spilled directly into the containment sump (dimensionless)
5. Water temperature of containment spray during the injection phase (°F); 100°F per Design Input 4.12
6. Water temperature of the SI flow during the injection phase (°F); 100°F per Design Input 4.13

Containment spray flow is discussed in Design Input 4.12. Safety injection flow and the temperature of the recirculated sump water are discussed in Design Input 4.13. Sump water recirculation start time is identified in Design Input 4.14.

With the sump water at 220°F, the water specific volume is 0.016775 ft^3/lb_m [Ref. 6.22], and the recirculated spray water mass flowrate per spray train from the sump at 1950 gpm is calculated to be

$$w_{CS,\ recirc} = (1950\ gpm)(60\ min/hr)(1/7.48\ gallons/ft^3)(1/0.016775\ ft^3/lb_m)$$

$$w_{CS,\ recirc} = \mathbf{9.3244E5\ lb_m/hr}$$

The recirculated spray water flow with two train operation is 18.6488E5 lb_m/hr.

The pumped SI flow to the RCS before and after recirculation is shown in Design Input 4.13 with units of lb_m/sec. The table below shows the pumped SI flows after conversion to units of lb_m/hr, required for the Card Series 801 table. The post-recirculation SI flow for the pump discharge leg LOCAs has been increased to include the 25% direct floor spillage, and the spillage fraction of 0.25 is included in the 801 table for those cases. Station Emergency Operating Instruction SO23-12-13 [Loss of Coolant Accident, Ref. 6.23] identifies operator action to realign pumped safety injection from the cold legs to 50% cold leg and 50% hot leg injection after about 2 hours following a large break LOCA. Realignment of the pumped safety injection will reduce the spillage fraction for the pump discharge LOCA by one-half. In the case of a hot leg LOCA, realignment of the pumped safety injection flow will result in 50% spillage for single train operation if the active train is feeding the failed hot leg. In the case of two train operation, SI realignment will only result in 25% spillage. Based on ABB-CE's spillage methodology, the realignment of pumped safety injection from 100% to the cold legs to a 50:50 split between cold and hot legs will only affect Card Series 801 for the pump discharge and hot leg LOCAs as shown in the pumped safety injection summary table below.

Case/Description	Injection Phase (lb_m/hr)	Recirculation Phase (lb_m/hr)	Recirculation Spillage Fraction w/CL Injection	w/50:50 CL:HL Injection
1 - DEDLS w/DG Failure	2.8449E6	4.6598E5	0.25	0.125
2 - DEDLS w/CS Train Failure	4.4597E6	9.3200E5	0.25	0.125
3 - DEDLS w/ECU Train Failure	4.4597E6	9.3200E5	0.25	0.125
4 - DESLS w/DG Failure	2.9661E6	4.6598E5	0	0
5 - DESLS w/CS Train Failure	5.9321E6	9.3200E5	0	0
6 - DESLS w/ECU Train Failure	5.9321E6	9.3200E5	0	0
7 - DEHLS w/DG Failure	2.9661E6	4.6598E5	0	0.50
8 - DEHLS w/CS Train Failure	5.9321E6	9.3200E5	0	0.25
9 - DEHLS w/ECU Train Failure	5.9321E6	9.3200E5	0	0.25

Provided below, are the Care Series 801 listings for each of the nine LOCA cases.

Case 1, DEDLS LOCA w/DG Failure

```
$LIST POOL=801,      0,          0,    0,       0,    100,    100,
                    33,          0,    0,       0,    100,    100,
                    35,   0.4973E5,    0,       0,    100,    100,
                    40,   1.2184E5,    0,       0,    100,    100,
                    45,   2.6357E5,    0,       0,    100,    100,
                    50,   3.0584E5,    0,       0,    100,    100,
                    55,   3.3567E5,    0,       0,    100,    100,
                    60,   7.9567E5,    0,       0,    100,    100,
                   311,   7.9567E5,    0,       0,    100,    100,
                   311,   7.9567E5, 2.8449E6,   0,    100,    100,
                  2437,   7.9567E5, 2.8449E6,   0,    100,    100,
                  2437,   9.3244E5, 4.6598E5,  0.25,    0,      0,
                  7200,   9.3244E5, 4.6598E5,  0.25,    0,      0,
                  7200,   9.3244E5, 4.6598E5,  0.125,   0,      0,
             1.00001E7,   9.3244E5, 4.6598E5,  0.125,   0,      0 $END
```

Case 2, DEDLS LOCA w/CS Train Failure

```
$LIST POOL=801,      0,          0,    0,       0,    100,    100,
                    33,          0,    0,       0,    100,    100,
                    35,   0.4973E5,    0,       0,    100,    100,
                    40,   1.2184E5,    0,       0,    100,    100,
                    45,   2.6357E5,    0,       0,    100,    100,
                    50,   3.0584E5,    0,       0,    100,    100,
                    55,   3.3567E5,    0,       0,    100,    100,
                    60,   7.9567E5,    0,       0,    100,    100,
                   258,   7.9567E5,    0,       0,    100,    100,
```

```
                258,        7.9567E5,   4.4597E6,   0,      100,    100,
               1383,        7.9567E5,   4.4597E6,   0,      100,    100,
               1383,        9.3244E5,   9.3200E5,   0.25,     0,      0,
               7200,        9.3244E5,   9.3200E5,   0.25,     0,      0,
               7200,        9.3244E5,   9.3200E5,   0.125,    0,      0,
           1.00001E7,       9.3244E5,   9.3200E5,   0.125,    0,      0 $END
```

Case 3, DEDLS LOCA w/ECU Train Failure

```
$LIST POOL=801,     0,              0,   0,         0,      100,    100,
                   33,              0,   0,         0,      100,    100,
                   35,        0.9946E5,   0,         0,      100,    100,
                   40,        2.4368E5,   0,         0,      100,    100,
                   45,        5.2714E5,   0,         0,      100,    100,
                   50,        6.1168E5,   0,         0,      100,    100,
                   55,        6.7134E5,   0,         0,      100,    100,
                   60,       15.9134E5,   0,         0,      100,    100,
                  258,       15.9134E5,   0,         0,      100,    100,
                  258,       15.9134E5,   4.4597E6,  0,      100,    100,
                 1242,       15.9134E5,   4.4597E6,  0,      100,    100,
                 1242,       18.6488E5,   9.3200E5,  0.25,     0,      0,
                 7200,       18.6488E5,   9.3200E5,  0.25,     0,      0,
                 7200,       18.6488E5,   9.3200E5,  0.125,    0,      0,
            1.00001E7,       18.6488E5,   9.3200E5,  0.125,    0,      0 $END
```

Case 4, DESLS LOCA w/DG Failure

```
$LIST POOL=801,     0,              0,   0,         0,      100,    100,
                   33,              0,   0,         0,      100,    100,
                   35,        0.4973E5,   0,         0,      100,    100,
                   40,        1.2184E5,   0,         0,      100,    100,
                   45,        2.6357E5,   0,         0,      100,    100,
                   50,        3.0584E5,   0,         0,      100,    100,
                   55,        3.3567E5,   0,         0,      100,    100,
                   60,        7.9567E5,   0,         0,      100,    100,
                  254,        7.9567E5,   0,         0,      100,    100,
                  254,        7.9567E5,   2.9661E6,  0,      100,    100,
                 2437,        7.9567E5,   2.9661E6,  0,      100,    100,
                 2437,        9.3244E5,   4.6598E5,  0,        0,      0,
                 7200,        9.3244E5,   4.6598E5,  0,        0,      0,
                 7200,        9.3244E5,   4.6598E5,  0,        0,      0,
            1.00001E7,        9.3244E5,   4.6598E5,  0,        0,      0 $END
```

Case 5, DESLS LOCA w/CS Train Failure

```
$LIST POOL=801,     0,              0,   0,         0,      100,    100,
                   33,              0,   0,         0,      100,    100,
                   35,        0.4973E5,   0,         0,      100,    100,
                   40,        1.2184E5,   0,         0,      100,    100,
                   45,        2.6357E5,   0,         0,      100,    100,
                   50,        3.0584E5,   0,         0,      100,    100,
                   55,        3.3567E5,   0,         0,      100,    100,
                   60,        7.9567E5,   0,         0,      100,    100,
                  174,        7.9567E5,   0,         0,      100,    100,
                  174,        7.9567E5,   5.9321E6,  0,      100,    100,
```

```
                1375,      7.9567E5,  5.9321E6,  0,     100,   100,
                1375,      9.3244E5,  9.3200E5,  0,       0,     0,
                7200,      9.3244E5,  9.3200E5,  0,       0,     0,
                7200,      9.3244E5,  9.3200E5,  0,       0,     0,
            1.00001E7,     9.3244E5,  9.3200E5,  0,       0,     0 $END
```

Case 6, DESLS LOCA w/ECU Train Failure

```
$LIST POOL=801,    0,            0,   0,        0,     100,   100,
                  33,            0,   0,        0,     100,   100,
                  35,      0.9946E5,  0,        0,     100,   100,
                  40,      2.4368E5,  0,        0,     100,   100,
                  45,      5.2714E5,  0,        0,     100,   100,
                  50,      6.1168E5,  0,        0,     100,   100,
                  55,      6.7134E5,  0,        0,     100,   100,
                  60,     15.9134E5,  0,        0,     100,   100,
                 174,     15.9134E5,  0,        0,     100,   100,
                 174,     15.9134E5,  5.9321E6, 0,     100,   100,
                1236,     15.9134E5,  5.9321E6, 0,     100,   100,
                1236,     18.6488E5,  9.3200E5, 0,       0,     0,
                7200,     18.6488E5,  9.3200E5, 0,       0,     0,
                7200,     18.6488E5,  9.3200E5, 0,       0,     0,
            1.00001E7,    18.6488E5,  9.3200E5, 0,       0,     0 $END
```

Case 7, DEHLS LOCA w/DG Failure

```
$LIST POOL=801,    0,            0,   0,        0,     100,   100,
                 12.2,           0,   0,        0,     100,   100,
                 12.2,           0,   2.9661E6, 0,     100,   100,
                  33,            0,   2.9661E6, 0,     100,   100,
                  35,      0.4973E5,  2.9661E6, 0,     100,   100,
                  40,      1.2184E5,  2.9661E6, 0,     100,   100,
                  45,      2.6357E5,  2.9661E6, 0,     100,   100,
                  50,      3.0584E5,  2.9661E6, 0,     100,   100,
                  55,      3.3567E5,  2.9661E6, 0,     100,   100,
                  60,      7.9567E5,  2.9661E6, 0,     100,   100,
                2401,      7.9567E5,  2.9661E6, 0,     100,   100,
                2401,      9.3244E5,  4.6598E5, 0,       0,     0,
                7200,      9.3244E5,  4.6598E5, 0,       0,     0,
                7200,      9.3244E5,  4.6598E5, 0.5,     0,     0,
            1.00001E7,     9.3244E5,  4.6598E5, 0.5,     0,     0 $END
```

Case 8, DEHLS LOCA w/CS Train Failure

```
$LIST POOL=801,    0,            0,   0,        0,     100,   100,
                 12.2,           0,   0,        0,     100,   100,
                 12.2,           0,   5.9321E6, 0,     100,   100,
                  33,            0,   5.9321E6, 0,     100,   100,
                  35,      0.4973E5,  5.9321E6, 0,     100,   100,
                  40,      1.2184E5,  5.9321E6, 0,     100,   100,
                  45,      2.6357E5,  5.9321E6, 0,     100,   100,
                  50,      3.0584E5,  5.9321E6, 0,     100,   100,
                  55,      3.3567E5,  5.9321E6, 0,     100,   100,
```

```
                60,      7.9567E5,   5.9321E6,   0,      100,    100,
              1348,      7.9567E5,   5.9321E6,   0,      100,    100,
              1348,      9.3244E5,   9.3200E5,   0,        0,      0,
              7200,      9.3244E5,   9.3200E5,   0,        0,      0,
              7200,      9.3244E5,   9.3200E5,   0.25,     0,      0,
         1.00001E7,      9.3244E5,   9.3200E5,   0.25,     0,      0 $END
```

Case 9, DEHLS LOCA w/ECU Train Failure

```
$LIST POOL=801,       0,            0,      0,        0,      100,    100,
                   12.2,            0,      0,        0,      100,    100,
                   12.2,            0,   5.9321E6,    0,      100,    100,
                     33,            0,   5.9321E6,    0,      100,    100,
                     35,      0.9946E5,   5.9321E6,   0,      100,    100,
                     40,      2.4368E5,   5.9321E6,   0,      100,    100,
                     45,      5.2714E5,   5.9321E6,   0,      100,    100,
                     50,      6.1168E5,   5.9321E6,   0,      100,    100,
                     55,      6.7134E5,   5.9321E6,   0,      100,    100,
                     60,     15.9134E5,   5.9321E6,   0,      100,    100,
                   1212,     15.9134E5,   5.9321E6,   0,      100,    100,
                   1212,     18.6488E5,   9.3200E5,   0,        0,      0,
                   7200,     18.6488E5,   9.3200E5,   0,        0,      0,
                   7200,     18.6488E5,   9.3200E5,   0.25,     0,      0,
              1.00001E7,     18.6488E5,   9.3200E5,   0.25,     0,      0 $END
```

8.1.18 Card Series 901

Card Series 901 provides for the arbitrary addition of air to the containment atmosphere. The air addition table can include up to 20 sets of data consisting of time in seconds, air addition rate in lb_m/hr, and temperature of the added air in °F. A minimum of two sets of data are required. This card series will be used to model the addition of safety injection tank nitrogen to containment following the time that the SI tanks are empty of borated SI water. Per Design Input 4.15, a mass flow rate of 1.2874E6 lbm/hr at 120°F will be modeled from 90 to 100 seconds post LOCA for each case. The fact that COPATTA treats the addition as air rather than pure nitrogen does not significantly affect the results of this relatively small mass addition.

```
$LIST POOL=901,       0,            0,          0,
                     90,            0,          0,
                     90,      1.2874E6,       120,
                    100,      1.2874E6,       120,
                    100,            0,          0,
              1.00001E7,            0,          0 $END
```

8.1.19 Card Series 1001

Card Series 1001 models the outside ambient air temperature and the convective heat transfer coefficient at the external surface of passive heat sinks exposed to the outside air environment. This information is specifically used for heat transfer calculations at the outside surface of heat sinks # 1 and #2 (containment building dome and cylindrical walls above grade level) described in Sections 8.1.2.1 and 8.1.2.2, respectively.

The data in the table covers a 24-hour period post accident and may have up to 25 data sets. The data in the table is applied to as many 24-hour daily cycles as is required by the specified length of the COPATTA analysis. A minimum of 2 data sets is required. For the containment peak P-T response analyses following the LOCA event, a constant outside air temperature of 100°F is modeled (Design Input 4.3). The outside containment surface convective heat transfer coefficient is specified as 2 Btu/hr-ft^2-°F as recommended by Reference 6.16. The data table for Card Series 1001 is:

```
$LIST POOL=1001,     0,        100,        2.0,
                    24,        100,        2.0 $END
```

8.1.20 Card Series 1101

Card Series 1101 is used to provide the heat removal capability of an individual emergency air cooling unit (ECU) as a function of containment atmosphere saturation temperature. A maximum of 40 sets of data may be supplied; a minimum of 2 sets of data is required. As described in Design Input 4.5, the ECU performance data is taken from Table 1 of Reference 6.13 and reduced by 2% to provide additional ECU margin, and reflects a constant Component Cooling Water (CCW) supply temperature of 105°F. The units of the data are temperature in °F and heat removal in Btu/hr.

Emergency Air Cooling Unit Performance

Vapor (saturation) Temperature (°F)	Single ECU Design Basis Heat Removal Rate (Btu/hr)	98% Design Basis ECU Heat Removal Rate (Btu/hr)
105	0	0
120	1.67E6	1.637E6
130	3.02E6	2.960E6
140	4.57E6	4.479E6
150	6.32E6	6.194E6
160	8.27E6	8.105E6
170	10.40E6	10.192E6
180	12.73E6	12.475E6
190	15.23E6	14.925E6
200	17.88E6	17.522E6
210	20.68E6	20.266E6
220	23.61E6	23.138E6
230	26.64E6	26.107E6
240	29.74E6	29.145E6
250	32.91E6	32.252E6
260	36.11E6	35.388E6
270	39.31E6	38.524E6
280	42.52E6	41.670E6
287	44.74E6	43.845E6
290	45.69E6	44.776E6
300	48.82E6	47.844E6

The Card Series 1101 data input set is:

```
$LIST POOL=1101, 105,          0,
                 120,      1.637E6,
                 130,      2.960E6,
                 140,      4.479E6,
                 150,      6.194E6,
                 160,      8.105E6,
                 170,     10.192E6,
                 180,     12.475E6,
                 190,     14.925E6,
                 200,     17.522E6,
                 210,     20.266E6,
                 220,     23.138E6,
                 230,     26.107E6,
                 240,     29.145E6,
                 250,     32.252E6,
                 260,     35.388E6,
                 270,     38.524E6,
                 280,     41.670E6,
                 287,     43.845E6,
                 290,     44.776E6,
                 300,     47.844E6 $END
```

8.1.21 Card Series 1201

Card Series 1201 provides the containment spray efficiency as a function of the containment water vapor to air mass ratio. Per Design Input 4.12, this parameter is taken from Figure 2 of Reference 6.17. The input table may consist of up to 40 data sets; a minimum of 1 data set is required. The data table for Card Series 1201 is:

```
$LIST POOL=1201,   0,      0.729,
                 0.1,      0.737,
                 0.2,      0.747,
                 0.3,      0.757,
                 0.4,      0.771,
                 0.5,      0.788,
                 0.6,      0.809,
                 0.7,      0.832,
                 0.8,      0.863,
                 0.9,      0.912,
                 1.0,      0.961,
                 1.2,      0.995,
                 1.3,      1.000 $END
```

8.1.22 Card Series 9001

Card Series 9001 is used to specify the calculational time intervals and the data printout intervals. The following data is included in each input line:

1. Time (seconds)
2. Calculational Interval (seconds)
3. Energy Balance/Containment Conditions Printout Interval (seconds)
4. Heat Sink Temperature Distribution & Details Printout Frequency (dimensionless)

The selection of calculational time steps is based on guidance provided in the COPATTA User's Manual and Reference 6.16. This calculation uses smaller time steps than suggested to assure an accurate analysis. The frequency of output data and detailed heat sink printouts is selected to provide smooth output plots for results presentation. The run control table may contain up to 50 input lines with a minimum requirement of one input line. The Card Series 9001 data input set for the LOCA analysis is:

```
$LIST POOL=9001,      1,     0.05,     0.1,      10,
                     10,     0.05,     1.0,       9,
                     20,     0.05,     1.0,      10,
                    100,     0.10,     2.0,      10,
                    300,     0.10,     5.0,      10,
                    400,     0.10,    10.0,       5,
                    600,      1.0,    20.0,       5,
                   1200,      5.0,    50.0,       4,
                   1400,      5.0,    20.0,       5,
                   2400,      5.0,    50.0,       4,
                   2500,      5.0,    20.0,       5,
                  4E+03,     10.0,     100,       5,
                  1E+04,     25.0,     500,       4,
                  3E+04,     50.0,    2500,       4,
                  1E+05,     50.0,    5000,       2,
                  3E+05,     50.0,   25000,       4,
                  1E+06,     50.0,  100000,       1,
                  2E+06,     50.0,  250000,       4,
                  4E+06,     50.0,  500000,       2,
                  2E+07,     50.0, 1000000,       1 $END
```

8.1.23 Variable End Card

This card must follow the group of variable data cards. The entry contains the following fixed information in columns 2 through 21:

```
$LIST POOL=9999 $END
```

8.2 COPATTA Passive Heat Sink Data

The heat sink data series describes the physical characteristics of passive structural heat sink in containment. Twenty specific heat sinks are modeled (Card Series 1, item 7). Each heat sink (number XX) is detailed in the COPATTA Code as a set of heat sink data cards. Each set of heat sink data cards includes:

Title Card
Card Series 1XX001 - general information on the heat sink
Card Series 1XX101 - identifies the mesh point spacing in each region of the heat sink
Card Series 1XX201 - identifies the material in each region of the heat sink
Card Series 1XX300 - specifies decay heat generation within heat sink regions
Card Series 1XX400 - specifies boundary conditions for left and right surfaces of the heat sink

The specific heat sinks modeled in the analysis are:

1 Reactor Building Dome
2 Reactor Building Cylinder Wall above grade level @ Elev. 30 ft.
3 Reactor Building Cylinder Wall below grade level @ Elev. 30 ft.
4 Reactor Building Basemat (excluding Rx Cavity Basemat)
5 Reactor Cavity Basemat & Steam Generator Pedestals
6 Reactor Cavity Wall below Containment Floor @ Elev. *ca* 17' - 6"
7 Reactor Cavity Wall above Containment Floor @ Elev. *ca*. 17' - 6"
8 Lined Refueling Canal Walls and Floor
9 Un-lined, Exterior Faces of Refueling Canal Walls
10 Steam Generator Compartment Walls and Missile Shields
11 Steam Generator Compartment Walls With Embeds
12 Elevated Floor Slabs (Top Half Thickness)
13 Elevated Floor Slabs (Lower Half-Thickness with Carbon Steel Decking)
14 Lifting Devices (carbon steel)
15 Miscellaneous Carbon Steel (thickness > 2.5 inches)
16 Miscellaneous Carbon Steel (1.0 inches < thickness </= 2.5 inches)
17 Miscellaneous Carbon Steel (0.5 inches < thickness </= 1.0 inches)
18 Miscellaneous Carbon Steel (thickness </= 0.5 inches)
19 Electrical Equipment & Other Galvanized Steel
20 Miscellaneous Stainless Steel
21 Reactor Building Stiffened Sections

8.2.1 Changes to Referenced MSLB Heat Sink Model

The only change required to use the heat sinks from Reference 6.14 in this LOCA P-T calculation is to change the heat transfer coefficient control on all surfaces exposed to the containment vapor region on Card Series 1XX400 from 9 (Uchida condensing heat transfer for MSLB analyses) to 2 (Modified Tagami condensing heat transfer for LOCA analyses).

8.2.2 COPATTA Heat Sink Listing Input for LOCA Analysis

```
* HS #1 - REACTOR BUILDING DOME
 $LIST POOL=101001, 57, 14, 0, 0, 0, 0, 33017 $END
 $LIST POOL=101101,  4, 0.00024, 5, 0.00083, 2, 0.02166, 4, 0.02170,
                     5, 0.02201, 4, 0.03001, 4, 0.04601, 4. 0.07801,
                     4, 0.14201, 4, 0.27001, 4, 0.52601, 4, 1.03801,
                     4, 2.06201, 4, 4.06368 $END
 $LIST POOL=101201, 4, 4, 1, 5, 5, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=101300, 0, 0 $END
 $LIST POOL=101400, 2, 2, 1, 1 $END
* HS #2 - REACTOR BUILDING CYLINDER ABOVE 30 FT
 $LIST POOL=102001,  58, 14, 0, 0, 0, 0, 34067 $END
 $LIST POOL=102101, 4, 0.00024, 5, 0.00083, 2, 0.02166, 4, 0.02170,
                    5, 0.02201, 4, 0.03001, 4, 0.04601, 4, 0.07801,
                    4, 0.14210, 4, 0.27001, 4, 0.52601, 4, 1.03801,
                    4, 2.06201, 5, 4.35534 $END
 $LIST POOL=102201, 4, 4, 1, 5, 5, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=102300, 0, 0 $END
 $LIST POOL=102400, 2, 2, 1, 1 $END
* HS #3 - REACTOR BUIDING CYLINDER WALL BELOW 30 FT
 $LIST POOL=103001,  58, 14, 0, 0, 0, 0, 5535 $END
 $LIST POOL=103101, 4, 0.00024, 5, 0.00083, 2, 0.02166, 4, 0.02170,
                    5, 0.02201, 4, 0.03001, 4, 0.04601, 4, 0.07801,
                    4, 0.14210, 4, 0.27001, 4, 0.52601, 4, 1.03801,
                    4, 2.06201, 5, 4.35534 $END
 $LIST POOL=103201, 4, 4, 1, 5, 5, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=103300, 0, 0 $END
 $LIST POOL=103400, 2, 2, 0, 1 $END
* HS #4 - REACTOR BUILDING BASEMAT (Excluding Rx Cavity Basemat)
 $LIST POOL=104001, 42, 10, 0, 0, 0, 0, 12773 $END
 $LIST POOL=104101, 4, 0.00417, 4, 0.02417, 4, 0.06417, 4, 0.14417,
                    4, 0.30417, 4, 0.62417, 4, 1.26417, 4, 2.54417,
                    4, 5.10417, 5, 11.00417 $END
 $LIST POOL=104201, 4, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=104300, 0, 0 $END
 $LIST POOL=104400, 3, 3, 0, 1 $END
* HS #5 - REACTOR CAVITY BASEMAT & STEAM GENERATOR PEDESTALS
 $LIST POOL=105001, 40, 10, 0, 0, 0, 0, 1644 $END
 $LIST POOL=105101, 4, 0.00294, 4, 0.02294, 4, 0.06294, 4, 0.14294,
                    4, 0.30294, 4, 0.62294, 4, 1.26294, 4, 2.54294,
                    4, 5.10294, 3, 8.39548 $END
 $LIST POOL=105201, 4, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=105300, 0, 0 $END
 $LIST POOL=105400, 3, 3, 0, 1 $END
* HS #6 - REACTOR CAVITY BELOW ElEV. 17' - 6"
 $LIST POOL=106001, 42, 10, 0, 0, 0, 0, 1546 $END
 $LIST POOL=106101, 4, 0.00250, 4, 0.02250, 4, 0.06250, 4, 0.14250,
                    4, 0.30250, 4, 0.62250, 4, 1.26250, 4, 2.54250,
                    4, 5.10250, 5, 10.75250 $END
 $LIST POOL=106201, 4, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
 $LIST POOL=106300, 0, 0 $END
 $LIST POOL=106400, 3, 3, 0, 1 $END
* HS #7 - REACTOR CAVITY WALLS ABOVE ELEV. 17'- 6"
 $LIST POOL=107001, 61, 14, 0, 0, 0, 0, 1311 $END
 $LIST POOL=107101, 4, 0.00024, 4, 0.00060, 8, 0.00250, 4, 0.00650,
                    4, 0.01450, 4, 0.03050, 4, 0.06250, 4, 0.12650,
                    4, 0.26850, 4, 0.52450, 4, 1.03650, 4, 2.06050,
                    4, 4.10850, 4, 8.83583 $END
```

```
$LIST POOL=107201, 4, 4, 4, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
$LIST POOL=107300, 0, 0 $END
$LIST POOL=107400, 2, 2, 0, 2 $END
* HS #8 - LINED REFUELING CANAL WALLS AND FLOOR
$LIST POOL=108001, 50, 13, 0, 0, 0, 0, 9192 $END
$LIST POOL=108101, 4, 0.01563, 4, 0.01566, 4, 0.01571, 4, 0.01583,
                   3, 0.01598, 4, 0.02598, 4, 0.04598, 4, 0.08598,
                   4, 0.16598, 4, 0.32698, 4, 0.64598, 4, 1.28598,
                   2, 2.01598 $END
$LIST POOL=108201, 3, 5, 5, 5, 5, 2, 2, 2, 2, 2, 2, 2, 2, $END
$LIST POOL=108300, 0, 0 $END
$LIST POOL=108400, 2, 2, 0, 2 $END
* HS #9 - UNLINED EXTERIOR FACES OF REFUELING CANAL WALLS
$LIST POOL=109001, 45, 12, 0, 0, 0, 0, 11050 $END
$LIST POOL=109101, 4, 0.00024, 4, 0.00072, 4, 0.00168, 2, 0.00250,
                   4, 0.01250, 4, 0.03250, 4, 0.07250, 4, 0.15250,
                   4, 0.31250, 4, 0.63250, 4, 1.27250, 2, 2.00250 $END
$LIST POOL=109201, 4, 4, 4, 4, 2, 2, 2, 2, 2, 2, 2, 2, $END
$LIST POOL=109300, 0, 0 $END
$LIST POOL=109400, 2, 2, 0, 2 $END
* HS #10 - STEAM GENERATOR COMPARTMENT WALLS MISSLE SHIELDS
$LIST POOL=110001, 46, 11, 0, 0, 0, 0, 43085 $END
$LIST POOL=110101, 4, 0.00024, 4, 0.00072, 4, 0.00168, 2, 0.00250,
                   4, 0.01250, 4, 0.03250, 4, 0.07250, 4, 0.15250,
                   4, 0.31250, 4, 0.63250, 7, 1.71909 $END
$LIST POOL=110201, 4, 4, 4, 4, 2, 2, 2, 2, 2, 2, 2 $END
$LIST POOL=110300, 0, 0 $END
$LIST POOL=110400, 2, 2, 0, 2 $END
* HS #11 - STEAM GENERATOR COMPARTMENT WALLS WITH EMBEDS
$LIST POOL=111001, 53, 12, 0, 0, 0, 0, 6914 $END
$LIST POOL=111101, 4, 0.00024, 5, 0.00083, 4, 0.08250, 4, 0.08490,
                   4, 0.08970, 4, 0.09930, 4, 0.11850, 4, 0.15690,
                   4, 0.23370, 4, 0.38730, 4, 0.69450, 7, 1.77167 $END
$LIST POOL=111201, 4, 4, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
$LIST POOL=111300, 0, 0 $END
$LIST POOL=111400, 2, 2, 0, 2 $END
* HS #12 - TOP HALF-THICKNESS OF ELEVATED FLOOR SLABS
$LIST POOL=112001, 44, 10, 0, 0, 0, 0, 17474 $END
$LIST POOL=112101, 4, 0.00024, 4, 0.00072, 4, 0.00168, 5, 0.00417,
                   4, 0.01417, 4, 0.03417, 4, 0.07417, 4, 0.15417,
                   4, 0.31417, 6, 0.75417 $END
$LIST POOL=112201, 4, 4, 4, 4, 2, 2, 2, 2, 2, 2 $END
$LIST POOL=112300, 0, 0 $END
$LIST POOL=112400, 2, 2, 0, 2 $END
* HS #13 - LOWER HALF-THICKNESS OF ELEVATED FLOOR SLABS
$LIST POOL=113001, 48, 12, 0, 0, 0, 0, 23240 $END
$LIST POOL=113101, 2, 0.00521, 4, 0.00556, 4, 0.00617, 4, 0.00745,
                   4, 0.01001, 4, 0.01513, 4, 0.02537, 4, 0.04585,
                   4, 0.08681, 4, 0.16873, 4, 0.33257, 5, 0.75556 $END
$LIST POOL=113201, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2 $END
$LIST POOL=113300, 0, 0 $END
$LIST POOL=113400, 2, 2, 0, 2 $END
* HS #14 - LIFTING DEVICES (CARBON STEEL)
$LIST POOL=114001, 17, 3, 0, 0, 0, 0, 59265 $END
$LIST POOL=114101, 4, 0.00024, 8, 0.00125, 4, 0.04133 $END
$LIST POOL=114201, 4, 4, 1 $END
$LIST POOL=114300, 0, 0 $END
$LIST POOL=114400, 2, 2, 0, 2 $END
* HS #15 - MISCELLANEOUS CARBON STEEL - THICKNESS > 2.50 INCHES
$LIST POOL=115001, 18, 4, 0, 0, 0, 0, 2248 $END
```

```
 $LIST POOL=115101, 4, 0.00024, 5, 0.00083, 4, 0.08083, 4, 0.22136 $END
 $LIST POOL=115201, 4, 4, 1, 1 $END
 $LIST POOL=115300, 0, 0 $END
 $LIST POOL=115400, 2, 2, 0, 2 $END
* HS #16 - MISCELLANEOUS CARBON STEEL: 1.00"<THICKNESS</=2.50"
 $LIST POOL=116001, 16, 3, 0, 0, 0, 0, 9230 $END
 $LIST POOL=116101, 4, 0.00024, 5, 0.00083, 6, 0.13113 $END
 $LIST POOL=116201, 4, 4, 1 $END
 $LIST POOL=116300, 0, 0 $END
 $LIST POOL=116400, 2, 2, 0, 2 $END
* HS #17 - MISCELLANEOUS CARBON STEEL: 0.50"<THICKNESS</=1.00"
 $LIST POOL=117001, 14, 3, 0, 0, 0, 0, 8718 $END
 $LIST POOL=117101, 4, 0.00024, 5, 0.00083, 4, 0.06371 $END
 $LIST POOL=117201, 4, 4, 1 $END
 $LIST POOL=117300, 0, 0 $END
 $LIST POOL=117400, 2, 2, 0, 2 $END
* HS #18 - MISCELLANEOUS CARBON STEEL: THICKNESS</=0.5"
 $LIST POOL=118001, 14, 3, 0, 0, 0, 0, 158855 $END
 $LIST POOL=118101, 4, 0.00024, 5, 0.00083, 4, 0.02301 $END
 $LIST POOL=118201, 4, 4, 1 $END
 $LIST POOL=118300, 0, 0 $END
 $LIST POOL=118400, 2, 2, 0, 2 $END
* HS #19 - ELECTRICAL EQUIPMENT & OTHER GALVANIZED STEEL
 $LIST POOL=119001, 4, 1, 0, 0, 0, 0, 131698 $END
 $LIST POOL=119101, 3, 0.00879 $END
 $LIST POOL=119201, 1 $END
 $LIST POOL=119300, 0, 0 $END
 $LIST POOL=119400, 2, 2, 0, 2 $END
* HS #20 - MISCELLANEOUS STAINLESS STEEL
 $LIST POOL=120001, 5, 1, 0, 0, 0, 0, 26893 $END
 $LIST POOL=120101, 4, 0.01459 $END
 $LIST POOL=120201, 3 $END
 $LIST POOL=120300, 0, 0 $END
 $LIST POOL=120400, 2, 2, 0, 2 $END
* HS #21 - REACTOR BUILDING STIFFENED SECTIONS ABOVE ELEV. 30 FT
 $LIST POOL=121001, 44, 10, 0, 0, 0, 0, 3764 $END
 $LIST POOL=121101, 4, 0.00024, 5, 0.00083, 4, 0.08083, 4, 0.24083,
                    4, 0.52166, 4, 0.52201, 4, 0.54201, 4, 0.94201,
                    4, 1.74201, 6, 4.17659 $END
 $LIST POOL=121201, 4, 4, 1, 1, 1, 5, 2, 2, 2, 2 $END
 $LIST POOL=121300, 0, 0 $END
 $LIST POOL=121400, 2, 2, 1, 1 $END
 $LIST POOL=410001,
           25,     54,
          0.8,     30,
           10,     54,
         0.15,     20,
       0.0174, 0.0103 $END
 $LIST POOL=500000 $END
```

8.3 COPATTA Input Files

This section contains the variable data input file for each of the nine LOCA cases analyzed. The heat sink file shown in Section 8.2.2 is added to the variable data file for each case following the $LIST POOL=9999 $ END card at the end of the variable data file to provide the complete input file for each case.

Case 1, DEDLS LOCA w/DG Failure

```
* CASE 1 - DEDLS LOCA w/LOP&DG Failure (min SI) N-4080-026R1; 2ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,12,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,2,311 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                  1.0E+01,  1.40669E+09,
                  2.0E+01,  9.95691E+08,
                  3.0E+01,  7.85072E+08,
                  6.0E+01,  5.75572E+08,
                 1.00E+02,  5.08637E+08,
                 2.00E+02,  4.30510E+08,
                 4.00E+02,  3.58179E+08,
                1.000E+03,  2.72813E+08,
                1.800E+03,  2.35686E+08,
                2.700E+03,  2.07082E+08,
                3.600E+03,  1.87376E+08,
                7.200E+03,  1.50229E+08,
               1.8000E+04,  1.18335E+08,
               3.6000E+04,  9.41483E+07,
               5.4000E+04,  8.21067E+07,
               7.2000E+04,  7.53054E+07,
               8.6400E+04,  7.16199E+07,
              1.72800E+05,  5.88206E+07,
              2.59200E+05,  5.08008E+07,
              4.32000E+05,  4.10087E+07,
              6.91200E+05,  3.37355E+07,
             1.036800E+06,  2.89365E+07,
             2.592000E+06,  1.96478E+07,
             6.048000E+06,  1.24410E+07,
            1.0368000E+07,  9.14378E+06 $END
 $LIST POOL=201,
                       0,  2.47909E7,
                  2.20E2,  2.47909E7,
                  2.20E2,          0,
                  3.11E2,          0,
                  3.11E2,  3.42417E8,
                  5.13E2,  3.38630E8,
                  6.13E2,  1.42818E7,
                 1.013E3,  1.14450E7,
                 4.226E3,  6.08605E6,
                1.0026E4,  3.57160E6,
                1.9626E4,  2.46029E6,
                4.2260E4,  1.50213E6,
```

```
          8.8260E4,  7.62653E5,
          9.4266E4,  5.71655E5,
          1.9826E5,  2.23797E5,
          2.9626E5,  1.29554E5,
          5.3565E5,  8.81150E4,
         1.03065E6,  2.28200E4,
         1.27565E6,  1.05506E4,
         1.52565E6,  1.00088E4,
         2.01565E6,  5.34510E3,
         2.75565E6,  4.83980E3,
         3.00565E6,  5.16344E3,
         3.25065E6,  2.81562E3,
         1.00001E7,  2.81562E3 $END
$LIST POOL=301,
               0,          0,      0,
       0.0103421,  2.75463e+08,  554.43,
       0.0203421,  2.72956e+08,  553.61,
       0.0303421,  2.74063e+08,  553.27,
       0.0403421,  2.76931e+08,  553.31,
       0.0503421,  2.97586e+08,  553.46,
       0.0603421,  2.84049e+08,  553.54,
       0.0703421,  2.78919e+08,  553.48,
       0.0803421,  2.86323e+08,  553.41,
       0.0901884,  3.45168e+08,  554.02,
       0.100686,   4.12405e+08,  554.03,
       0.150686,   4.36972e+08,  556.16,
       0.200686,   4.22471e+08,  556.85,
       0.250686,   4.20134e+08,  557.26,
       0.300686,   4.17128e+08,  557.32,
       0.350686,   4.07365e+08,  557.23,
       0.400686,   4.10645e+08,  557.16,
       0.450686,   4.05922e+08,  557.09,
       0.499686,   4.04438e+08,  557.03,
       1.00069,    3.73813e+08,  558.71,
       1.50069,    3.01578e+08,  569.10,
       2.00069,    2.62691e+08,  576.37,
       2.50069,    2.16451e+08,  577.37,
       3.00069,    1.97648e+08,  579.33,
       4.00131,    1.66789e+08,  619.63,
       5.00044,    1.24285e+08,  679.25,
       6.00044,    1.18203e+08,  661.96,
       7.00044,    9.53597e+07,  694.06,
       8.00044,    7.54916e+07,  744.56,
       9.00044,    3.60446e+07, 1016.36,
      10.0021,     2.91492e+07,  959.57,
      11.0021,     4.28504e+07,  656.17,
      12.0021,     4.37940e+07,  475.01,
      12.5021,     3.79980e+07,  419.00,
      13.0017,     3.43031e+07,  373.20,
      13.5008,     3.75977e+07,  345.15,
      14.0008,     1.25310e+07,  336.27,
      14.2008,     9.74693e+06,  334.46,
      14.4008,     6.42028e+06,  336.95,
      14.6008,     2.18261e+06,  362.69,
      14.7998,     0.00000e+00,  362.69,
      14.810,      0.00000e+00, 1301.13,
      14.900,      3.77532e+05, 1301.13,
      19.200,      2.20187e+06, 1288.31,
      20.700,      2.61400e+06, 1282.75,
      20.710,      1.30700e+06, 1282.75,
```

```
      23.400,     1.31195e+06, 1277.20,
      27.600,     1.30934e+06, 1273.24,
      31.700,     1.30277e+06, 1271.18,
      35.900,     1.29503e+06, 1269.52,
      40.100,     1.28695e+06, 1268.00,
      44.300,     1.27876e+06, 1266.50,
      48.400,     1.27078e+06, 1265.05,
      52.600,     1.26266e+06, 1263.51,
      56.800,     1.25451e+06, 1262.01,
      61.000,     1.24634e+06, 1260.50,
      65.100,     1.23833e+06, 1259.03,
      69.300,     1.23007e+06, 1257.53,
      73.500,     1.22175e+06, 1256.07,
      77.590,     1.21360e+06, 1254.63,
      77.600,     2.42719e+06, 1254.63,
      87.100,     2.27790e+06, 1252.93,
      96.600,     2.14567e+06, 1251.54,
     106.100,     2.03411e+06, 1250.13,
     115.600,     1.94281e+06, 1248.63,
     125.100,     1.86890e+06, 1247.04,
     134.600,     1.80990e+06, 1245.31,
     144.100,     1.76328e+06, 1243.41,
     153.600,     1.72616e+06, 1241.57,
     163.100,     1.69808e+06, 1239.42,
     172.600,     1.67656e+06, 1237.12,
     182.100,     1.66018e+06, 1234.73,
     191.600,     1.58706e+06, 1180.54,
     201.100,     1.42006e+06, 1180.55,
     210.600,     1.27188e+06, 1180.53,
     220.000,     1.14152e+06, 1180.55,
     220.100,     1.11528e+06, 1193.29,
     220.800,     1.14768e+06, 1170.67,
     222.300,     1.11585e+06, 1183.78,
     224.600,     1.11928e+06, 1177.60,
     227.600,     1.09476e+06, 1182.83,
     231.400,     1.08230e+06, 1175.69,
     235.900,     1.04847e+06, 1183.76,
     241.200,     1.02051e+06, 1177.77,
     247.200,     9.79736e+05, 1182.43,
     254.000,     9.38851e+05, 1179.20,
     261.600,     8.84830e+05, 1181.36,
     269.900,     7.30166e+05, 1179.80,
     279.000,     6.66313e+05, 1181.76,
     288.800,     5.57809e+05, 1180.06,
     299.400,     4.96379e+05, 1180.81,
     311.000,     4.20296e+05, 1179.93,
     311.000,            0.00, 1179.93,
   1.00001e+07,          0.00,    0.00 $END
$LIST POOL=401,
           0,  0,  0,
       3.11e2,  0,  0,
       3.11e2,  1,  0.984,
       5.13e2,  1,  0.986,
       6.13e2,  1,  0.816,
      1.013e3,  1,  0.775,
      4.226e3,  1,  0.547,
     1.0026e4,  1,  0.322,
     1.9626e4,  1,  0.237,
     8.8260e4,  1,  0.232,
     9.4260e4,  1,  0.040,
```

```
            1.9826e5,  1,  0.309,
            5.3565e5,  1,  0.588,
           1.03065e6,  1,  0.207,
           1.27565e6,  1,  0.314,
           1.52565e6,  1,  0.277,
           2.01565e6,  1,  0.323,
           3.00565e6,  1,  0.300,
           3.25065e6,  1,  0.358,
           1.00001e7,  1,  0.358 $END
$LIST POOL=501,
              0.0,  0,  0,
       1.00001e+07,  0,  0 $END
$LIST POOL=601,
             0.00,  1.29388e+07,  1.16203e+09,
            14.81,  1.29388e+07,  1.16203e+09,
            14.81,  1.30599e+07,  1.17027e+09,
            15.00,  1.33098e+07,  1.23842e+09,
            15.50,  1.34253e+07,  1.26993e+09,
            16.00,  1.34633e+07,  1.28027e+09,
            16.50,  1.35312e+07,  1.29881e+09,
            17.00,  1.36864e+07,  1.34112e+09,
            18.00,  1.39285e+07,  1.40715e+09,
            19.00,  1.41250e+07,  1.46703e+09,
            20.00,  1.42965e+07,  1.50753e+09,
            20.70,  3.83107e+07,  3.63378e+09,
            22.70,  3.67122e+07,  3.49392e+09,
            25.70,  3.47342e+07,  3.31987e+09,
            30.00,  3.25346e+07,  3.12520e+09,
            30.00,  1.95958e+07,  1.96317e+09,
            30.70,  1.92378e+07,  1.93148e+09,
            35.70,  1.72636e+07,  1.75607e+09,
            40.70,  1.56645e+07,  1.61357e+09,
            45.70,  1.43246e+07,  1.49386e+09,
            50.70,  1.31732e+07,  1.39075e+09,
            60.70,  1.12672e+07,  1.21943e+09,
            70.70,  9.72313e+06,  1.07993e+09,
            77.70,  1.33456e+06,  3.39165e+08,
            78.70,  1.21176e+05,  8.23997e+06,
           199.90,  1.21176e+05,  8.23997e+06,
           200.00,  5.34204e+05,  1.20834e+08,
           220.10,  8.70696e+05,  2.12560e+08,
           240.10,  1.59858e+06,  4.10979e+08,
           260.10,  1.82275e+06,  4.72082e+08,
           280.10,  2.09941e+06,  5.47502e+08,
           300.10,  2.20370e+06,  5.75931e+08,
           320.10,  2.26271e+06,  5.92016e+08,
           320.11,  1.21176e+05,  8.23997e+06,
          2437.00,  1.21176e+05,  8.23997e+06,
          2437.00,          0.00,          0.00,
       1.00001e+07,          0.00,          0.00 $END
$LIST POOL=701,
                0,  0,      1,  0,
            2.20e2,  0,      1,  0,
            2.20e2,  0,      0,  0,
            3.11e2,  0,      0,  0,
            3.11e2,  0,  0.016,  0,
            5.13e2,  0,  0.014,  0,
            6.13e2,  0,  0.184,  0,
           1.013e3,  0,  0.225,  0,
           4.226e3,  0,  0.453,  0,
```

```
          1.0026e4,  0,   0.678,  0,
          1.9626e4,  0,   0.763,  0,
          4.2260e4,  0,   0.785,  0,
          9.4260e4,  0,   0.960,  0,
          1.9826e5,  0,   0.691,  0,
          2.9626e5,  0,   0.561,  0,
          5.3565e5,  0,   0.412,  0,
         1.03065e6,  0,   0.793,  0,
         2.01565e6,  0,   0.677,  0
         3.25065e6,  0,   0.642,  0,
         1.00001e7,  0,   0.642,  0 $END
$LIST POOL=801,
                0,          0,          0,      0,  100,  100,
               33,          0,          0,      0,  100,  100,
               35, 0.4973e+05,          0,      0,  100,  100,
               40, 1.2184e+05,          0,      0,  100,  100,
               45, 2.6357e+05,          0,      0,  100,  100,
               50, 3.0584e+05,          0,      0,  100,  100,
               55, 3.3567e+05,          0,      0,  100,  100,
               60, 7.9567e+05,          0,      0,  100,  100,
              311, 7.9567e+05,          0,      0,  100,  100,
              311, 7.9567e+05, 2.8449e+06,      0,  100,  100,
             2437, 7.9567e+05, 2.8449e+06,      0,  100,  100,
             2437, 9.3244e+05, 4.6598e+05,   0.25,    0,    0,
             7200, 9.3244e+05, 4.6598e+05,   0.25,    0,    0,
             7200, 9.3244e+05, 4.6598e+05,  0.125,    0,    0,
        1.00001e+7, 9.3244e+05, 4.6598e+05,  0.125,    0,    0 $END
$LIST POOL=901,
                0,        0,    0,
               90,        0,    0,
               90, 1.2874e6,  120,
              100, 1.2874e6,  120,
              100,        0,    0,
      1.00001e+07,        0,    0 $END
$LIST POOL=1001,
            0,  100,  2.0,
           24,  100,  2.0 $END
$LIST POOL=1101,
           105,      0.000,
           120,  1.637e+06,
           130,  2.960e+06,
           140,  4.479e+06,
           150,  6.194e+06,
           160,  8.105e+06,
           170,  1.0192e+07,
           180,  1.2475e+07,
           190,  1.4925e+07,
           200,  1.7522e+07,
           210,  2.0266e+07,
           220,  2.3138e+07,
           230,  2.6107e+07,
           240,  2.9145e+07,
           250,  3.2252e+07,
           260,  3.5388e+07,
           270,  3.8524e+07,
           280,  4.1670e+07,
           287,  4.3845e+07,
           290,  4.4776e+07,
           300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
```

```
            0.0,  0.729,
            0.1,  0.737,
            0.2,  0.747,
            0.3,  0.757,
            0.4,  0.771,
            0.5,  0.788,
            0.6,  0.809,
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

Case 2, DEDLS LOCA w/CS Train Failure

```
* CASE 2 - DEDLS LOCA w/LOP&NoDG Failure (max SI) N-4080-026R1: 4ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,12,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,120,258 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,4,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
```

```
                3.600E+03,  1.87376E+08,
                7.200E+03,  1.50229E+08,
               1.8000E+04,  1.18335E+08,
               3.6000E+04,  9.41483E+07,
               5.4000E+04,  8.21067E+07,
               7.2000E+04,  7.53054E+07,
               8.6400E+04,  7.16199E+07,
              1.72800E+05,  5.88206E+07,
              2.59200E+05,  5.08008E+07,
              4.32000E+05,  4.10087E+07,
              6.91200E+05,  3.37355E+07,
             1.036800E+06,  2.89365E+07,
             2.592000E+06,  1.96478E+07,
             6.048000E+06,  1.24410E+07,
            1.0368000E+07,  9.14378E+06 $END
$LIST POOL=201,
                     0,  2.85550E7,
                 1.91E2,  2.85550E7,
                 1.91E2,         0,
                 2.58E2,         0,
                 2.58E2,  3.53688E8,
                4.929E2,  3.44505E8,
                4.979E2,  2.28144E7,
                2.116E3,  1.21308E7,
                4.916E3,  7.68744E6,
               1.0116E4,  4.52556E6,
               3.9160E4,  1.76203E6,
               8.9160E4,  7.61407E5,
               9.5160E4,  5.91714E5,
               1.0116E5,  5.70175E5,
               2.9716E5,  1.05156E5,
               5.3790E5,  7.57767E4,
               7.8790E5,  2.31177E4,
              1.03290E6,  1.76747E4,
              1.52790E6,  5.52391E3,
              2.01790E6,  4.83905E3,
              2.26790E6,  1.08000E3,
              2.75790E6,  4.08218E3,
              3.00790E6,  1.18800E3,
              3.25290E6,  2.85090E3,
              1.00001E7,  2.85090E3 $END
$LIST POOL=301,
                     0,          0,      0,
             0.0103421,  2.75463e+08,  554.43,
             0.0203421,  2.72956e+08,  553.61,
             0.0303421,  2.74063e+08,  553.27,
             0.0403421,  2.76931e+08,  553.31,
             0.0503421,  2.97586e+08,  553.46,
             0.0603421,  2.84049e+08,  553.54,
             0.0703421,  2.78919e+08,  553.48,
             0.0803421,  2.86323e+08,  553.41,
             0.0901884,  3.45168e+08,  554.02,
             0.100686,   4.12405e+08,  554.03,
             0.150686,   4.36972e+08,  556.16,
             0.200686,   4.22471e+08,  556.85,
             0.250686,   4.20134e+08,  557.26,
             0.300686,   4.17128e+08,  557.32,
             0.350686,   4.07365e+08,  557.23,
             0.400686,   4.10645e+08,  557.16,
             0.450686,   4.05922e+08,  557.09,
```

```
0.499686,   4.04438e+08,  557.03,
1.00069,    3.73813e+08,  558.71,
1.50069,    3.01578e+08,  569.10,
2.00069,    2.62691e+08,  576.37,
2.50069,    2.16451e+08,  577.37,
3.00069,    1.97648e+08,  579.33,
4.00131,    1.66789e+08,  619.63,
5.00044,    1.24285e+08,  679.25,
6.00044,    1.18203e+08,  661.96,
7.00044,    9.53597e+07,  694.06,
8.00044,    7.54916e+07,  744.56,
9.00044,    3.60446e+07, 1016.36,
10.0021,    2.91492e+07,  959.57,
11.0021,    4.28504e+07,  656.17,
12.0021,    4.37940e+07,  475.01,
12.5021,    3.79980e+07,  419.00,
13.0017,    3.43031e+07,  373.20,
13.5008,    3.75977e+07,  345.15,
14.0008,    1.25310e+07,  336.27,
14.2008,    9.74693e+06,  334.46,
14.4008,    6.42028e+06,  336.95,
14.6008,    2.18261e+06,  362.69,
14.7998,    0.00000e+00,  362.69,
14.810,     0.00000e+00, 1301.15,
14.900,     3.84804e+05, 1301.15,
19.200,     2.27808e+06, 1287.75,
20.700,     2.61515e+06, 1282.34,
20.710,     1.30757e+06, 1282.34,
23.400,     1.31211e+06, 1276.97,
27.600,     1.30921e+06, 1273.17,
31.800,     1.30241e+06, 1271.09,
35.900,     1.29483e+06, 1269.47,
40.100,     1.28673e+06, 1267.96,
44.300,     1.27854e+06, 1266.46,
48.500,     1.27039e+06, 1264.96,
52.700,     1.26225e+06, 1263.44,
56.900,     1.25411e+06, 1261.92,
61.000,     1.24614e+06, 1260.44,
65.200,     1.23791e+06, 1258.94,
69.400,     1.22965e+06, 1257.46,
73.600,     1.22134e+06, 1255.98,
77.690,     1.21316e+06, 1254.58,
77.700,     2.42633e+06, 1254.58,
85.300,     2.39594e+06, 1251.95,
92.900,     2.36552e+06, 1249.28,
100.400,    2.33536e+06, 1246.69,
108.000,    2.30461e+06, 1244.06,
115.500,    2.27387e+06, 1241.55,
123.100,    2.24237e+06, 1239.05,
130.600,    2.21026e+06, 1236.81,
138.200,    2.17850e+06, 1234.29,
145.700,    2.14686e+06, 1231.86,
153.300,    2.11432e+06, 1229.66,
160.800,    1.98961e+06, 1180.52,
168.400,    1.81735e+06, 1180.54,
175.900,    1.66489e+06, 1180.53,
183.500,    1.52780e+06, 1180.52,
191.000,    1.40112e+06, 1180.55,
191.100,    1.40671e+06, 1179.25,
191.600,    1.36652e+06, 1182.93,
```

```
          192.700,      1.38259e+06, 1179.00,
          194.400,      1.35362e+06, 1182.18,
          196.600,      1.34309e+06, 1177.02,
          199.400,      1.30238e+06, 1182.93,
          202.800,      1.27903e+06, 1176.32,
          206.700,      1.23832e+06, 1183.02,
          211.100,      1.01260e+06, 1178.71,
          216.100,      1.00484e+06, 1183.92,
          221.700,      8.47980e+05, 1178.45,
          227.900,      7.95247e+05, 1182.09,
          234.600,      6.75108e+05, 1180.29,
          241.800,      6.07892e+05, 1179.81,
          249.600,      5.10221e+05, 1181.35,
          258.000,      4.40352e+05, 1179.17,
          258.010,            0.00, 1179.19,
      1.00001e+07,            0.00,    0.00 $END
$LIST POOL=401,
                 0,  0,  0,
             2.58e2,  0,  0,
             2.58e2,  1,  0.974,
            4.929e2,  1,  0.976,
            4.979e2,  1,  0.804,
            2.116e3,  1,  0.632,
            4.916e3,  1,  0.476,
           1.0116e4,  1,  0.258,
           3.9160e4,  1,  0.154,
           8.9160e4,  1,  0.185,
           9.5160e4,  1,  0.013,
           1.0116e5,  1,  0.073,
           2.9716e5,  1,  0.483,
           5.3790e5,  1,  0.618,
           1.0329e6,  1,  0.181,
           1.5279e6,  1,  0.345,
           2.0179e6,  1,  0.253,
           3.2529e6,  1,  0.366,
          1.00001e7,  1,  0.366 $END
$LIST POOL=501,
               0.0,  0,  0,
        1.00001e+07,  0,  0 $END
$LIST POOL=601,
              0.00,  1.29388e+07,  1.16203e+09,
             14.81,  1.29388e+07,  1.16203e+09,
             14.81,  1.44106e+07,  1.26211e+09,
             15.00,  1.46660e+07,  1.33176e+09,
             15.50,  1.47864e+07,  1.36461e+09,
             16.00,  1.48271e+07,  1.37570e+09,
             16.50,  1.49086e+07,  1.39794e+09,
             17.00,  1.50649e+07,  1.44055e+09,
             18.00,  1.53111e+07,  1.50772e+09,
             19.00,  1.55127e+07,  1.56267e+09,
             20.00,  1.56896e+07,  1.61094e+09,
             20.70,  4.09957e+07,  3.84314e+09,
             22.70,  4.28680e+07,  4.00866e+09,
             25.70,  3.74204e+07,  3.52923e+09,
             30.00,  3.74204e+07,  3.52923e+09,
             30.00,  2.44816e+07,  2.36720e+09,
             30.70,  2.19246e+07,  2.14088e+09,
             35.70,  1.99508e+07,  1.96550e+09,
             40.70,  1.83523e+07,  1.82305e+09,
             50.70,  1.58621e+07,  1.60032e+09,
```

```
              60.70,  1.39573e+07,  1.42911e+09,
              70.70,  1.24125e+07,  1.28971e+09,
              77.70,  1.14841e+07,  1.20527e+08,
              78.70,  1.92366e+06,  1.39847e+08,
              90.70,  1.99084e+06,  1.45758e+08,
              97.70,  2.03015e+06,  1.49218e+08,
             120.00,  2.15705e+06,  1.60385e+08,
             140.00,  2.27423e+06,  1.70697e+08,
             160.00,  2.41117e+06,  2.31808e+08,
             180.00,  2.68207e+06,  4.19938e+08,
             191.00,  3.03423e+06,  5.25998e+08,
             211.00,  4.66593e+06,  9.70796e+08,
             231.00,  5.11740e+06,  1.09387e+09,
             251.00,  5.26615e+06,  1.13441e+09,
             251.01,  1.47179e+06,  1.00082e+08,
            1383.00,  1.47179e+06,  1.00082e+08,
            1383.00,        0.00,        0.00,
        1.00001e+07,        0.00,        0.00 $END
$LIST POOL=701,
                 0,  0,      1,  0,
             1.91e2,  0,      1,  0,
             1.91e2,  0,      0,  0,
             2.58e2,  0,      0,  0,
             2.58e2,  0,  0.026,  0,
            4.929e2,  0,  0.024,  0,
            4.979e2,  0,  0.196,  0,
            2.116e3,  0,  0.368,  0,
            4.916e3,  0,  0.524,  0,
           1.0116e4,  0,  0.742,  0,
           3.9160e4,  0,  0.846,  0,
           8.9160e4,  0,  0.815,  0,
           9.5160e4,  0,  0.987,  0,
           1.0116e5,  0,  0.927,  0,
           2.9716e5,  0,  0.517,  0,
           5.3790e5,  0,  0.382,  0,
           7.8790e5,  0,  0.626,  0,
          1.03290e6,  0,  0.819,  0,
          3.25290e6,  0,  0.634,  0,
          1.00001e7,  0,  0.634,  0 $END
$LIST POOL=801,
                 0,         0,         0,      0,  100,  100,
                33,         0,         0,      0,  100,  100,
                35, 0.4973e+05,        0,      0,  100,  100,
                40, 1.2184e+05,        0,      0,  100,  100,
                45, 2.6357e+05,        0,      0,  100,  100,
                50, 3.0584e+05,        0,      0,  100,  100,
                55, 3.3567e+05,        0,      0,  100,  100,
                60, 7.9567e+05,        0,      0,  100,  100,
               258, 7.9567e+05,        0,      0,  100,  100,
               258, 7.9567e+05, 4.4597e+06,    0,  100,  100,
              1383, 7.9567e+05, 4.4597e+06,    0,  100,  100,
              1383, 9.3244e+05, 9.3200e+05,  0.25,    0,    0,
              7200, 9.3244e+05, 9.3200e+05,  0.25,    0,    0,
              7200, 9.3244e+05, 9.3200e+05, 0.125,    0,    0,
        1.00001e+7, 9.3244e+05, 9.3200e+05, 0.125,    0,    0 $END
$LIST POOL=901,
                 0,        0,    0,
                90,        0,    0,
                90, 1.2874e6,  120,
               100, 1.2874e6,  120,
```

```
                100,        0,    0,
        1.00001e+07,        0,    0 $END
$LIST POOL=1001,
             0,  100,  2.0,
            24,  100,  2.0 $END
$LIST POOL=1101,
            105,      0.000,
            120,  1.637e+06,
            130,  2.960e+06,
            140,  4.479e+06,
            150,  6.194e+06,
            160,  8.105e+06,
            170,  1.0192e+07,
            180,  1.2475e+07,
            190,  1.4925e+07,
            200,  1.7522e+07,
            210,  2.0266e+07,
            220,  2.3138e+07,
            230,  2.6107e+07,
            240,  2.9145e+07,
            250,  3.2252e+07,
            260,  3.5388e+07,
            270,  3.8524e+07,
            280,  4.1670e+07,
            287,  4.3845e+07,
            290,  4.4776e+07,
            300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
            0.0,  0.729,
            0.1,  0.737,
            0.2,  0.747,
            0.3,  0.757,
            0.4,  0.771,
            0.5,  0.788,
            0.6,  0.809,
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
                1,  0.05,       0.1,  10,
               10,  0.05,       1.0,   9,
               20,  0.05,       1.0,  10,
              100,   0.1,       2.0,  10,
              300,   0.1,       5.0,  10,
              400,   0.1,      10.0,   5,
              600,   1.0,      20.0,   5,
             1200,   5.0,      50.0,   4,
             1400,   5.0,      20.0,   5,
             2400,   5.0,      50.0,   4,
             2500,   5.0,      20.0,   5,
            4e+03,  10.0,       100,   5,
            1e+04,  25.0,       500,   4,
            3e+04,  50.0,      2500,   4,
            1e+05,  50.0,      5000,   2,
            3e+05,  50.0,     25000,   4,
            1e+06,  50.0,    100000,   1,
```

```
            2e+06,  50.0,    250000,   4,
            4e+06,  50.0,    500000,   2,
            2e+07,  50.0,   1000000,   1 $END
$LIST POOL=9999 $END
```

Case 3, DEDLS LOCA w/ECU Train Failure

```
* CASE 3 - DEDLS LOCA W/LOP&NoDG Failure (max SI) N-4080-026R1: 2ECUs & 2CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,12,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,120,258 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,13720,216,105,6.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
              8.6400E+04,  7.16199E+07,
             1.72800E+05,  5.88206E+07,
             2.59200E+05,  5.08008E+07,
             4.32000E+05,  4.10087E+07,
             6.91200E+05,  3.37355E+07,
            1.036800E+06,  2.89365E+07,
            2.592000E+06,  1.96478E+07,
            6.048000E+06,  1.24410E+07,
           1.0368000E+07,  9.14378E+06 $END
 $LIST POOL=201,
                      0,  2.85550E7,
                  1.91E2,  2.85550E7,
                  1.91E2,          0,
                  2.58E2,          0,
                  2.58E2,  3.56133E8,
                 4.929E2,  3.46912E8,
                 4.979E2,  2.60551E7,
                 1.258E3,  1.76703E7,
                 4.916E3,  7.69090E6,
                1.5116E4,  3.62903E6,
                4.9160E4,  1.46373E6,
                1.0116E5,  5.95098E5,
                2.9716E5,  1.02950E5,
                5.3790E5,  6.63568E4,
               1.03290E6,  9.78757E3,
               1.27790E6,  9.13788E3,
```

```
            1.52790E6,  5.19844E3,
            1.77290E6,  4.94600E3,
            2.01790E6,  1.44000E3,
            2.26790E6,  4.72590E3,
            2.51290E6,  1.18800E3,
            2.75790E6,  1.15200E3,
            3.00790E6,  2.88000E2,
            3.25290E6,  5.04000E2,
            1.00001E7,  5.04E2 $END
$LIST POOL=301,
                  0,          0,      0,
          0.0103421,  2.75463e+08,  554.43,
          0.0203421,  2.72956e+08,  553.61,
          0.0303421,  2.74063e+08,  553.27,
          0.0403421,  2.76931e+08,  553.31,
          0.0503421,  2.97586e+08,  553.46,
          0.0603421,  2.84049e+08,  553.54,
          0.0703421,  2.78919e+08,  553.48,
          0.0803421,  2.86323e+08,  553.41,
          0.0901884,  3.45168e+08,  554.02,
          0.100686,   4.12405e+08,  554.03,
          0.150686,   4.36972e+08,  556.16,
          0.200686,   4.22471e+08,  556.85,
          0.250686,   4.20134e+08,  557.26,
          0.300686,   4.17128e+08,  557.32,
          0.350686,   4.07365e+08,  557.23,
          0.400686,   4.10645e+08,  557.16,
          0.450686,   4.05922e+08,  557.09,
          0.499686,   4.04438e+08,  557.03,
          1.00069,    3.73813e+08,  558.71,
          1.50069,    3.01578e+08,  569.10,
          2.00069,    2.62691e+08,  576.37,
          2.50069,    2.16451e+08,  577.37,
          3.00069,    1.97648e+08,  579.33,
          4.00131,    1.66789e+08,  619.63,
          5.00044,    1.24285e+08,  679.25,
          6.00044,    1.18203e+08,  661.96,
          7.00044,    9.53597e+07,  694.06,
          8.00044,    7.54916e+07,  744.56,
          9.00044,    3.60446e+07, 1016.36,
         10.0021,     2.91492e+07,  959.57,
         11.0021,     4.28504e+07,  656.17,
         12.0021,     4.37940e+07,  475.01,
         12.5021,     3.79980e+07,  419.00,
         13.0017,     3.43031e+07,  373.20,
         13.5008,     3.75977e+07,  345.15,
         14.0008,     1.25310e+07,  336.27,
         14.2008,     9.74693e+06,  334.46,
         14.4008,     6.42028e+06,  336.95,
         14.6008,     2.18261e+06,  362.69,
         14.7998,     0.00000e+00,  362.69,
         14.810,      0.00000e+00, 1301.15,
         14.900,      3.84804e+05, 1301.15,
         19.200,      2.27808e+06, 1287.75,
         20.700,      2.61515e+06, 1282.34,
         20.710,      1.30757e+06, 1282.34,
         23.400,      1.31211e+06, 1276.97,
         27.600,      1.30921e+06, 1273.17,
         31.800,      1.30241e+06, 1271.09,
         35.900,      1.29483e+06, 1269.47,
```

```
      40.100,     1.28673e+06, 1267.96,
      44.300,     1.27854e+06, 1266.46,
      48.500,     1.27039e+06, 1264.96,
      52.700,     1.26225e+06, 1263.44,
      56.900,     1.25411e+06, 1261.92,
      61.000,     1.24614e+06, 1260.44,
      65.200,     1.23791e+06, 1258.94,
      69.400,     1.22965e+06, 1257.46,
      73.600,     1.22134e+06, 1255.98,
      77.690,     1.21316e+06, 1254.58,
      77.700,     2.42633e+06, 1254.58,
      85.300,     2.39594e+06, 1251.95,
      92.900,     2.36552e+06, 1249.28,
     100.400,     2.33536e+06, 1246.69,
     108.000,     2.30461e+06, 1244.06,
     115.500,     2.27387e+06, 1241.55,
     123.100,     2.24237e+06, 1239.05,
     130.600,     2.21026e+06, 1236.81,
     138.200,     2.17850e+06, 1234.29,
     145.700,     2.14686e+06, 1231.86,
     153.300,     2.11432e+06, 1229.66,
     160.800,     1.98961e+06, 1180.52,
     168.400,     1.81735e+06, 1180.54,
     175.900,     1.66489e+06, 1180.53,
     183.500,     1.52780e+06, 1180.52,
     191.000,     1.40112e+06, 1180.55,
     191.100,     1.40671e+06, 1179.25,
     191.600,     1.36652e+06, 1182.93,
     192.700,     1.38259e+06, 1179.00,
     194.400,     1.35362e+06, 1182.18,
     196.600,     1.34309e+06, 1177.02,
     199.400,     1.30238e+06, 1182.93,
     202.800,     1.27903e+06, 1176.32,
     206.700,     1.23832e+06, 1183.02,
     211.100,     1.01260e+06, 1178.71,
     216.100,     1.00484e+06, 1183.92,
     221.700,     8.47980e+05, 1178.45,
     227.900,     7.95247e+05, 1182.09,
     234.600,     6.75108e+05, 1180.29,
     241.800,     6.07892e+05, 1179.81,
     249.600,     5.10221e+05, 1181.35,
     258.000,     4.40352e+05, 1179.17,
     258.010,            0.00, 1179.19,
   1.00001e+07,          0.00,     0.00 $END
$LIST POOL=401,
           0,  0,  0,
       2.58e2,  0,  0,
       2.58e2,  1,  0.974,
      4.929e2,  1,  0.976,
      4.979e2,  1,  0.804,
      1.258e3,  1,  0.721,
      4.916e3,  1,  0.440,
     1.5116e4,  1,  0.194,
     4.9160e4,  1,  0.148,
     1.0116e5,  1,  0.082,
     2.9716e5,  1,  0.472,
     5.3790e5,  1,  0.673,
     1.0329e6,  1,  0.261,
     1.2779e6,  1,  0.209,
     1.5279e6,  1,  0.305,
```

```
          1.7729e6,  1,  0.269,
          2.0179e6,  1,  1.00,
          2.2679e6,  1,  0.236,
          2.5129e6,  1,  1.00,
         1.00001e7,  1,  1.00 $END
$LIST POOL=501,
             0.0,  0,  0,
     1.00001e+07,  0,  0 $END
$LIST POOL=601,
            0.00,  1.29388e+07,  1.16203e+09,
           14.81,  1.29388e+07,  1.16203e+09,
           14.81,  1.44106e+07,  1.26211e+09,
           15.00,  1.46660e+07,  1.33176e+09,
           15.50,  1.47864e+07,  1.36461e+09,
           16.00,  1.48271e+07,  1.37570e+09,
           16.50,  1.49086e+07,  1.39794e+09,
           17.00,  1.50649e+07,  1.44055e+09,
           18.00,  1.53111e+07,  1.50772e+09,
           19.00,  1.55127e+07,  1.56267e+09,
           20.00,  1.56896e+07,  1.61094e+09,
           20.70,  4.09957e+07,  3.84314e+09,
           22.70,  4.28680e+07,  4.00866e+09,
           25.70,  3.74204e+07,  3.52923e+09,
           30.00,  3.74204e+07,  3.52923e+09,
           30.00,  2.44816e+07,  2.36720e+09,
           30.70,  2.19246e+07,  2.14088e+09,
           35.70,  1.99508e+07,  1.96550e+09,
           40.70,  1.83523e+07,  1.82305e+09,
           50.70,  1.58621e+07,  1.60032e+09,
           60.70,  1.39573e+07,  1.42911e+09,
           70.70,  1.24125e+07,  1.28971e+09,
           77.70,  1.14841e+07,  1.20527e+08,
           78.70,  1.92366e+06,  1.39847e+08,
           90.70,  1.99084e+06,  1.45758e+08,
           97.70,  2.03015e+06,  1.49218e+08,
          120.00,  2.15705e+06,  1.60385e+08,
          140.00,  2.27423e+06,  1.70697e+08,
          160.00,  2.41117e+06,  2.31808e+08,
          180.00,  2.68207e+06,  4.19938e+08,
          191.00,  3.03423e+06,  5.25998e+08,
          211.00,  4.66593e+06,  9.70796e+08,
          231.00,  5.11740e+06,  1.09387e+09,
          251.00,  5.26615e+06,  1.13441e+09,
          251.01,  1.47179e+06,  1.00082e+08,
         1242.00,  1.47179e+06,  1.00082e+08,
         1242.00,        0.00,        0.00,
     1.00001e+07,        0.00,        0.00 $END
$LIST POOL=701,
               0,  0,      1,  0,
           1.91e2,  0,      1,  0,
           1.91e2,  0,      0,  0,
           2.58e2,  0,      0,  0,
           2.58e2,  0,  0.026,  0,
          4.929e2,  0,  0.024,  0,
          4.979e2,  0,  0.196,  0,
          1.258e3,  0,  0.279,  0,
          4.916e3,  0,  0.560,  0,
         1.5116e4,  0,  0.806,  0,
         4.9160e4,  0,  0.852,  0,
         1.0116e5,  0,  0.918,  0,
```

```
          2.9716e5,  0,   0.528,  0,
          5.3790e5,  0,   0.327,  0,
          1.0329e6,  0,   0.739,  0,
          1.7729e6,  0,   0.731,  0,
          2.0179e6,  0,       0,  0,
          2.2679e6,  0,   0.764,  0,
          2.5129e6,  0,       0,  0,
         1.00001e7,  0,       0,  0 $END
$LIST POOL=801,
              0,          0,          0,      0,  100,  100,
             33,          0,          0,      0,  100,  100,
             35,  0.9946e+05,         0,      0,  100,  100,
             40,  2.4368e+05,         0,      0,  100,  100,
             45,  5.2714e+05,         0,      0,  100,  100,
             50,  6.1168e+05,         0,      0,  100,  100,
             55,  6.7134e+05,         0,      0,  100,  100,
             60, 15.9134e+05,         0,      0,  100,  100,
            258, 15.9134e+05,         0,      0,  100,  100,
            258, 15.9134e+05, 4.4597e+06,     0,  100,  100,
           1242, 15.9134e+05, 4.4597e+06,     0,  100,  100,
           1242, 15.9134e+05, 9.3200e+05,  0.25,    0,    0,
           7200, 15.9134e+05, 9.3200e+05,  0.25,    0,    0,
           7200, 15.9134e+05, 9.3200e+05, 0.125,    0,    0,
       1.00001e+7, 15.9134e+05, 9.3200e+05, 0.125,  0,    0 $END
$LIST POOL=901,
              0,        0,    0,
             90,        0,    0,
             90, 1.2874e6,  120,
            100, 1.2874e6,  120,
            100,        0,    0,
     1.00001e+07,       0,    0 $END
$LIST POOL=1001,
           0,  100,  2.0,
          24,  100,  2.0 $END
$LIST POOL=1101,
          105,      0.000,
          120,  1.637e+06,
          130,  2.960e+06,
          140,  4.479e+06,
          150,  6.194e+06,
          160,  8.105e+06,
          170,  1.0192e+07,
          180,  1.2475e+07,
          190,  1.4925e+07,
          200,  1.7522e+07,
          210,  2.0266e+07,
          220,  2.3138e+07,
          230,  2.6107e+07,
          240,  2.9145e+07,
          250,  3.2252e+07,
          260,  3.5388e+07,
          270,  3.8524e+07,
          280,  4.1670e+07,
          287,  4.3845e+07,
          290,  4.4776e+07,
          300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
          0.0,  0.729,
          0.1,  0.737,
          0.2,  0.747,
```

Originator's Note:
Containment spray flow kept at 1600 gpm/train instead of increasing to 1950 gpm/train at start of recirculation. Long-term cooldown is conservative for this non-limiting case 3.

```
            0.3,  0.757,
            0.4,  0.771,
            0.5,  0.788,
            0.6,  0.809,
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

Case 4, DESLS LOCA w/DG Failure

```
* CASE 4 - DESLS LOCA w/DG Failure (min SI) N-4080-026R1: 2ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,17,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,2,254 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
```

```
                1.8000E+04,  1.18335E+08,
                3.6000E+04,  9.41483E+07,
                5.4000E+04,  8.21067E+07,
                7.2000E+04,  7.53054E+07,
                8.6400E+04,  7.16199E+07,
               1.72800E+05,  5.88206E+07,
               2.59200E+05,  5.08008E+07,
               4.32000E+05,  4.10087E+07,
               6.91200E+05,  3.37355E+07,
              1.036800E+06,  2.89365E+07,
              2.592000E+06,  1.96478E+07,
              6.048000E+06,  1.24410E+07,
             1.0368000E+07,  9.14378E+06 $END
$LIST POOL=201,
                     0,  3.06922E7,
                 1.777E2,  3.06922E7,
                 1.777E2,         0,
                  2.54E2,         0,
                  2.54E2,  3.62923E8,
                 4.885E2,  3.56620E8,
                 4.935E2,  2.65569E7,
                 1.069E3,  1.75726E7,
                 2.938E3,  1.19027E7,
                1.0138E4,  6.30022E6,
                1.9738E4,  4.29145E6,
                4.9380E4,  2.10423E6,
                8.9380E4,  1.09725E6,
                9.5380E4,  8.71042E5,
                1.9938E5,  2.87978E5,
                5.3845E5,  9.53694E4,
                7.8845E5,  4.12270E4,
               1.27845E6,  1.05503E4,
               1.52845E6,  1.00455E4,
               1.77345E6,  5.99346E3,
               2.01845E6,  5.34499E3,
               2.75845E6,  4.87570E3,
               3.25345E6,  2.85157E3,
               1.00001E7,  2.85157E3 $END
$LIST POOL=301,
                     0,          0,      0,
               0.0101591,  2.76290e+08,  555.06,
               0.0201591,  2.71945e+08,  554.21,
               0.0301591,  2.70278e+08,  553.61,
               0.0401591,  2.70214e+08,  553.37,
               0.0501591,  2.70331e+08,  553.40,
               0.0601591,  2.69700e+08,  553.53,
               0.0701591,  2.68210e+08,  553.69,
               0.0800991,  2.66522e+08,  553.89,
               0.0900991,  2.65138e+08,  554.08,
               0.100099,   2.64412e+08,  554.30,
               0.150099,   2.68953e+08,  555.89,
               0.200099,   2.70322e+08,  557.21,
               0.250099,   2.74895e+08,  558.27,
               0.300099,   2.74942e+08,  559.11,
               0.350099,   2.77154e+08,  559.92,
               0.400099,   2.76002e+08,  560.74,
               0.450099,   2.76795e+08,  561.52,
               0.500099,   2.75253e+08,  562.39,
               1.00010,    2.66197e+08,  571.16,
               1.50010,    2.49140e+08,  576.47,
```

```
  2.00010,   2.31010e+08,  579.68,
  2.50010,   2.05488e+08,  586.33,
  3.00010,   1.62033e+08,  609.52,
  4.00082,   1.23496e+08,  629.33,
  5.00082,   1.12250e+08,  638.75,
  6.00082,   1.00938e+08,  654.69,
  7.00082,   9.31147e+07,  658.07,
  8.00082,   8.74523e+07,  656.30,
  9.00082,   8.14244e+07,  662.20,
 10.00080,   6.57601e+07,  719.48,
 11.00080,   5.60322e+07,  756.46,
 12.00440,   4.40165e+07,  800.42,
 12.99970,   3.39326e+07,  730.84,
 14.00430,   3.10272e+07,  674.77,
 15.00430,   2.51280e+07,  656.55,
 16.00190,   1.54538e+07,  706.73,
 16.49970,   1.35041e+07,  704.97,
 17.00020,   9.76676e+06,  769.16,
 17.50240,   8.85420e+06,  741.36,
 18.00060,   1.05321e+07,  570.22,
 18.19980,   9.92243e+06,  575.85,
 18.40250,   9.02380e+06,  597.71,
 18.41000,   0.00000e+00,  597.71,
 18.410,     0.00000e+00,  1293.42,
 18.500,     4.90032e+05,  1293.42,
 23.300,     3.39775e+06,  1271.47,
 23.310,     1.69888e+06,  1271.47,
 23.500,     1.70039e+06,  1270.51,
 28.300,     1.71092e+06,  1257.38,
 33.100,     1.70050e+06,  1251.98,
 37.900,     1.68505e+06,  1248.37,
 42.700,     1.66831e+06,  1245.23,
 47.500,     1.65119e+06,  1242.22,
 52.300,     1.63397e+06,  1239.27,
 57.200,     1.61644e+06,  1236.26,
 62.000,     1.59932e+06,  1233.30,
 66.800,     1.58168e+06,  1230.27,
 71.600,     1.56492e+06,  1227.18,
 76.400,     1.54818e+06,  1224.10,
 81.200,     1.53131e+06,  1221.42,
 86.000,     1.41716e+06,  1204.75,
 90.790,     1.31929e+06,  1205.88,
 90.800,     2.63858e+06,  1205.88,
 96.600,     2.42701e+06,  1205.78,
102.400,     2.20039e+06,  1206.28,
108.200,     1.99714e+06,  1206.92,
114.000,     1.81476e+06,  1207.66,
119.800,     1.65154e+06,  1208.54,
125.600,     1.50408e+06,  1209.50,
131.400,     1.36901e+06,  1210.63,
137.200,     1.25104e+06,  1211.73,
143.000,     1.14649e+06,  1212.86,
148.800,     1.05343e+06,  1214.07,
154.600,     9.70272e+05,  1215.27,
160.400,     8.95968e+05,  1216.49,
166.200,     8.29404e+05,  1217.72,
172.000,     7.69644e+05,  1218.91,
177.700,     7.16832e+05,  1220.12,
177.800,     6.83525e+05,  1263.17,
178.400,     7.32496e+05,  1180.38,
```

```
          179.600,      6.91780e+05,  1243.35,
          181.500,      7.21699e+05,  1202.55,
          184.100,      6.94955e+05,  1233.07,
          187.200,      6.98598e+05,  1216.97,
          191.000,      6.72955e+05,  1230.21,
          195.400,      6.60683e+05,  1221.25,
          200.500,      6.29539e+05,  1230.03,
          206.200,      6.08357e+05,  1224.98,
          212.500,      5.78120e+05,  1229.50,
          219.400,      5.53010e+05,  1229.93,
          227.000,      5.24149e+05,  1230.89,
          235.200,      4.98780e+05,  1229.88,
          244.100,      4.71776e+05,  1234.16,
          254.000,      4.47548e+05,  1230.83,
          254.010,            0.00,     0.00,
      1.00001e+07,            0.00,     0.00 $END
$LIST POOL=401,
                 0,  0,  0,
            2.54e2,  0,  0,
            2.54e2,  1,  0.921,
           4.885e2,  1,  0.930,
           4.935e2,  1,  0.494,
           1.069e3,  1,  0.400,
           2.938e3,  1,  0.303,
          1.0138e4,  1,  0.164,
          1.9738e4,  1,  0.132,
          4.9380e4,  1,  0.136,
          8.9380e4,  1,  0.163,
          9.5380e4,  1,  0.010,
          1.9938e5,  1,  0.241,
          2.9738e5,  1,  0.387,
          5.3845e5,  1,  0.544,
          7.8845e5,  1,  0.297,
         1.27845e6,  1,  0.314,
         1.77345e6,  1,  0.396,
         3.25345e6,  1,  0.366,
         1.00001e7,  1,  0.366 $END
$LIST POOL=501,
               0.0,  0,  0,
       1.00001e+07,  0,  0 $END
$LIST POOL=601,
               0.00,         0.00,         0.00,
              18.41,         0.00,         0.00,
              18.50,  2.45016e+05,  6.68232e+07,
              19.00,  4.87476e+05,  1.32949e+08,
              19.50,  5.45184e+05,  1.48683e+08,
              19.80,  6.56856e+05,  1.79140e+08,
              20.00,  7.58268e+05,  2.06802e+08,
              20.30,  8.96040e+05,  2.44378e+08,
              20.50,  9.80748e+05,  2.67479e+08,
              21.00,  1.17572e+06,  3.20655e+08,
              21.60,  1.38881e+06,  3.78770e+08,
              23.30,  3.36829e+07,  3.27793e+09,
              25.30,  3.12365e+07,  3.06455e+09,
              30.30,  2.66106e+07,  2.65719e+09,
              35.30,  2.32559e+07,  2.35940e+09,
              40.30,  2.06477e+07,  2.12674e+09,
              45.30,  1.85265e+07,  1.93681e+09,
              50.30,  1.67467e+07,  1.77669e+09,
              60.30,  1.38817e+07,  1.51815e+09,
```

```
            70.30,  1.16402e+07,  1.31426e+09,
            83.30,  9.37296e+06,  1.14046e+09,
            86.30,  8.93570e+06,  1.13810e+09,
            90.30,  8.37749e+06,  1.12791e+09,
            91.30,  7.60716e+05,  2.07369e+08,
            99.30,  5.77980e+05,  1.57560e+08,
           120.00,  5.86944e+05,  1.59994e+08,
           140.00,  7.81956e+05,  2.13158e+08,
           160.00,  9.59076e+05,  2.61443e+08,
           177.70,  1.08083e+06,  2.94634e+08,
           197.70,  1.93338e+06,  5.27033e+08,
           217.70,  2.01856e+06,  5.50253e+08,
           237.70,  2.06788e+06,  5.63695e+08,
           257.70,  2.10794e+06,  5.74618e+08,
           257.71,         0.00,         0.00,
      1.00001e+07,         0.00,         0.00 $END
$LIST POOL=701,
                0,  0,      1,  0,
            1.777e2,  0,      1,  0,
            1.777e2,  0,      0,  0,
             2.54e2,  0,      0,  0,
             2.54e2,  0,  0.079,  0,
            4.885e2,  0,  0.070,  0,
            4.935e2,  0,  0.506,  0,
            1.069e3,  0,  0.600,  0,
            2.938e3,  0,  0.697,  0,
           1.0138e4,  0,  0.836,  0,
           1.9738e4,  0,  0.868,  0,
           4.9380e4,  0,  0.864,  0,
           8.8380e4,  0,  0.837,  0,
           9.5380e4,  0,  0.990,  0,
           1.9938e5,  0,  0.759,  0,
           2.9738e5,  0,  0.613,  0,
           7.8845e5,  0,  0.703,  0,
          1.27845e6,  0,  0.686,  0,
          3.25345e6,  0,  0.634,  0,
          1.00001e7,  0,  0.634,  0 $END
$LIST POOL=801,
               0,         0,         0,     0,  100,  100,
              33,         0,         0,     0,  100,  100,
              35, 0.4973e+05,        0,     0,  100,  100,
              40, 1.2184e+05,        0,     0,  100,  100,
              45, 2.6357e+05,        0,     0,  100,  100,
              50, 3.0584e+05,        0,     0,  100,  100,
              55, 3.3567e+05,        0,     0,  100,  100,
              60, 7.9567e+05,        0,     0,  100,  100,
             254, 7.9567e+05,        0,     0,  100,  100,
             254, 7.9567e+05, 2.9661e+06,   0,  100,  100,
            2437, 7.9567e+05, 2.9661e+06,   0,  100,  100,
            2437, 9.3244e+05, 4.6598e+05,   0,    0,    0,
            7200, 9.3244e+05, 4.6598e+05,   0,    0,    0,
            7200, 9.3244e+05, 4.6598e+05,   0,    0,    0,
        1.00001e+7, 9.3244e+05, 4.6598e+05, 0,    0,    0 $END
$LIST POOL=901,
               0,         0,    0,
              90,         0,    0,
              90,   1.2874e6,  120,
             100,   1.2874e6,  120,
             100,         0,    0,
      1.00001e+07,         0,    0 $END
```

```
$LIST POOL=1001,
          0,  100,  2.0,
         24,  100,  2.0 $END
$LIST POOL=1101,
         105,      0.000,
         120,  1.637e+06,
         130,  2.960e+06,
         140,  4.479e+06,
         150,  6.194e+06,
         160,  8.105e+06,
         170,  1.0192e+07,
         180,  1.2475e+07,
         190,  1.4925e+07,
         200,  1.7522e+07,
         210,  2.0266e+07,
         220,  2.3138e+07,
         230,  2.6107e+07,
         240,  2.9145e+07,
         250,  3.2252e+07,
         260,  3.5388e+07,
         270,  3.8524e+07,
         280,  4.1670e+07,
         287,  4.3845e+07,
         290,  4.4776e+07,
         300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
         0.0,  0.729,
         0.1,  0.737,
         0.2,  0.747,
         0.3,  0.757,
         0.4,  0.771,
         0.5,  0.788,
         0.6,  0.809,
         0.7,  0.832,
         0.8,  0.863,
         0.9,  0.912,
         1.0,  0.961,
         1.1,  0.983,
         1.2,  0.995,
         1.3,  1.000 $END
$LIST POOL=9001,
           1,  0.05,      0.1,  10,
          10,  0.05,      1.0,   9,
          20,  0.05,      1.0,  10,
         100,   0.1,      2.0,  10,
         300,   0.1,      5.0,  10,
         400,   0.1,     10.0,   5,
         600,   1.0,     20.0,   5,
        1200,   5.0,     50.0,   4,
        1400,   5.0,     20.0,   5,
        2400,   5.0,     50.0,   4,
        2500,   5.0,     20.0,   5,
       4e+03,  10.0,      100,   5,
       1e+04,  25.0,      500,   4,
       3e+04,  50.0,     2500,   4,
       1e+05,  50.0,     5000,   2,
       3e+05,  50.0,    25000,   4,
       1e+06,  50.0,   100000,   1,
       2e+06,  50.0,   250000,   4,
       4e+06,  50.0,   500000,   2,
```

```
            2e+07,  50.0,   1000000,   1 $END
$LIST POOL=9999 $END
```

Case 5, DESLS LOCA w/CS Train Failure

```
* CASE 5 - DESLS LOCA w/LOP&NoDG Failure(max SI) N-4080-026R1: 4ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,17,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,120,174 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,4,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
              8.6400E+04,  7.16199E+07,
             1.72800E+05,  5.88206E+07,
             2.59200E+05,  5.08008E+07,
             4.32000E+05,  4.10087E+07,
             6.91200E+05,  3.37355E+07,
            1.036800E+06,  2.89365E+07,
            2.592000E+06,  1.96478E+07,
            6.048000E+06,  1.24410E+07,
           1.0368000E+07,  9.14378E+06 $END
 $LIST POOL=201,
                      0,  3.87909E7,
                 1.406E2,  3.87909E7,
                 1.406E2,         0,
                  1.74E2,         0,
                  1.74E2,  3.81434E8,
                 4.139E2,  3.65547E8,
                 4.189E2,  3.52358E7,
                  9.77E2,  2.27916E7,
                 1.977E3,  1.81719E7,
                 4.954E3,  1.16832E7,
                1.5154E4,  5.87462E6,
                3.9540E4,  2.83363E6,
                9.5540E4,  9.40802E5,
                1.9954E5,  2.67259E5,
                2.9754E5,  1.23300E5,
                5.3885E5,  7.57768E4,
                7.8885E5,  2.27573E4,
               1.03385E6,  1.76382E4,
```

```
            1.52885E6,  5.52380E3,
            2.01885E6,  4.87494E3,
            2.26885E6,  1.11600E3,
            2.51385E6,  4.04629E3,
            3.00885E6,  4.65786E3,
            3.25385E6,  2.45484E3,
            1.00001E7,  2.45484E3 $END
$LIST POOL=301,
                 0,          0,      0,
         0.0101591,  2.76290e+08,  555.06,
         0.0201591,  2.71945e+08,  554.21,
         0.0301591,  2.70278e+08,  553.61,
         0.0401591,  2.70214e+08,  553.37,
         0.0501591,  2.70331e+08,  553.40,
         0.0601591,  2.69700e+08,  553.53,
         0.0701591,  2.68210e+08,  553.69,
         0.0800991,  2.66522e+08,  553.89,
         0.0900991,  2.65138e+08,  554.08,
         0.100099,   2.64412e+08,  554.30,
         0.150099,   2.68953e+08,  555.89,
         0.200099,   2.70322e+08,  557.21,
         0.250099,   2.74895e+08,  558.27,
         0.300099,   2.74942e+08,  559.11,
         0.350099,   2.77154e+08,  559.92,
         0.400099,   2.76002e+08,  560.74,
         0.450099,   2.76795e+08,  561.52,
         0.500099,   2.75253e+08,  562.39,
         1.00010,    2.66197e+08,  571.16,
         1.50010,    2.49140e+08,  576.47,
         2.00010,    2.31010e+08,  579.68,
         2.50010,    2.05488e+08,  586.33,
         3.00010,    1.62033e+08,  609.52,
         4.00082,    1.23496e+08,  629.33,
         5.00082,    1.12250e+08,  638.75,
         6.00082,    1.00938e+08,  654.69,
         7.00082,    9.31147e+07,  658.07,
         8.00082,    8.74523e+07,  656.30,
         9.00082,    8.14244e+07,  662.20,
        10.00080,    6.57601e+07,  719.48,
        11.00080,    5.60322e+07,  756.46,
        12.00440,    4.40165e+07,  800.42,
        12.99970,    3.39326e+07,  730.84,
        14.00430,    3.10272e+07,  674.77,
        15.00430,    2.51280e+07,  656.55,
        16.00190,    1.54538e+07,  706.73,
        16.49970,    1.35041e+07,  704.97,
        17.00020,    9.76676e+06,  769.16,
        17.50240,    8.85420e+06,  741.36,
        18.00060,    1.05321e+07,  570.22,
        18.19980,    9.92243e+06,  575.85,
        18.40250,    9.02380e+06,  597.71,
        18.410,      0.00000e+00,  597.71,
        18.500,      5.02776e+05,  1293.36,
        22.300,      3.37244e+06,  1276.23,
        22.310,      1.68622e+06,  1276.23,
        23.500,      1.70127e+06,  1269.89,
        28.300,      1.71070e+06,  1257.17,
        33.100,      1.70003e+06,  1251.87,
        37.900,      1.68451e+06,  1248.29,
        42.700,      1.66775e+06,  1245.15,
```

```
      47.600,     1.65028e+06,  1242.09,
      52.400,     1.63305e+06,  1239.13,
      57.200,     1.61588e+06,  1236.19,
      62.000,     1.59876e+06,  1233.22,
      66.800,     1.58112e+06,  1230.19,
      71.700,     1.56400e+06,  1227.05,
      76.500,     1.54726e+06,  1223.97,
      81.300,     1.53040e+06,  1221.30,
      86.100,     1.41255e+06,  1204.79,
      90.890,     1.31501e+06,  1205.91,
      90.900,     2.63002e+06,  1205.91,
      94.300,     2.50132e+06,  1206.73,
      97.600,     2.38468e+06,  1207.48,
     100.900,     2.27333e+06,  1208.21,
     104.200,     2.16666e+06,  1208.91,
     107.500,     2.06431e+06,  1209.60,
     110.800,     1.96614e+06,  1210.29,
     114.100,     1.87189e+06,  1210.99,
     117.500,     1.77876e+06,  1211.72,
     120.800,     1.69204e+06,  1212.44,
     124.100,     1.60877e+06,  1213.19,
     127.400,     1.52719e+06,  1214.04,
     130.700,     1.44742e+06,  1214.87,
     134.000,     1.37081e+06,  1215.79,
     137.300,     1.29730e+06,  1216.73,
     140.600,     1.22666e+06,  1217.73,
     140.700,     1.22307e+06,  1205.88,
     140.900,     1.19081e+06,  1240.48,
     141.500,     1.16737e+06,  1203.69,
     142.300,     1.15462e+06,  1238.36,
     143.400,     1.13060e+06,  1212.05,
     144.800,     1.10273e+06,  1233.74,
     146.500,     1.07058e+06,  1217.03,
     148.400,     1.03638e+06,  1232.87,
     150.600,     9.90454e+05,  1222.65,
     153.100,     1.18497e+06,  1207.69,
     155.900,     4.23662e+05,  1230.10,
     159.000,     1.05582e+06,  1209.04,
     162.300,     6.98101e+05,  1236.23,
     165.900,     7.91903e+05,  1228.68,
     169.800,     4.46864e+05,  1189.66,
     174.000,     5.47423e+05,  1227.23,
     174.010,            0.00,     0.00,
   1.00001e+07,          0.00,     0.00 $END
$LIST POOL=401,
           0,  0,  0,
       1.74e2,  0,  0,
       1.74e2,  1,  0.906,
      4.139e2,  1,  0.917,
      4.189e2,  1,  0.520,
       9.77e2,  1,  0.386,
      1.977e3,  1,  0.369,
      4.954e3,  1,  0.277,
     1.5154e4,  1,  0.110,
     3.9540e4,  1,  0.096,
     9.5540e4,  1,  0.007,
     1.9954e5,  1,  0.218,
     2.9754e5,  1,  0.412,
     5.3885e5,  1,  0.618,
     7.8885e5,  1,  0.364,
```

```
          1.03385e6,  1,  0.180,
          1.52885e6,  1,  0.345,
          2.01885e6,  1,  0.258,
          3.25385e6,  1,  0.264,
          1.00001e7,  1,  0.264 $END
$LIST POOL=501,
              0.0,  0,  0,
      1.00001e+07,  0,  0 $END
$LIST POOL=601,
              0.00,         0.00,         0.00,
            18.410,         0.00,         0.00,
            18.500,  2.51388e+05,  6.85609e+07,
            19.000,  5.06016e+05,  1.38006e+08,
            19.500,  5.69304e+05,  1.55266e+08,
            19.800,  6.93324e+05,  1.89090e+08,
            20.000,  7.99524e+05,  2.18054e+08,
            20.300,  9.42624e+05,  2.57082e+08,
            20.500,  1.03061e+06,  2.81078e+08,
            21.000,  1.23365e+06,  3.36453e+08,
            21.600,  1.45667e+06,  3.97278e+08,
            22.300,  3.73558e+07,  3.59879e+09,
            25.300,  3.35592e+07,  3.26901e+09,
            30.300,  2.89637e+07,  2.86182e+09,
            35.300,  2.55858e+07,  2.56432e+09,
            40.300,  2.29813e+07,  2.33200e+09,
            45.300,  2.08641e+07,  2.14241e+09,
            50.300,  1.90880e+07,  1.98281e+09,
            60.300,  1.62309e+07,  1.72477e+09,
            70.300,  1.39972e+07,  1.52157e+09,
            80.300,  1.21702e+07,  1.35433e+09,
            83.300,  1.17431e+07,  1.35368e+09,
            86.300,  1.13067e+07,  1.34779e+09,
            90.300,  1.07515e+07,  1.33787e+09,
            91.300,  1.00228e+06,  2.48180e+08,
            93.300,  1.05955e+06,  2.79703e+08,
            95.300,  1.15085e+06,  3.13713e+08,
            99.300,  1.39990e+06,  3.81607e+08,
           120.000,  2.19575e+06,  5.98558e+08,
           140.600,  2.62213e+06,  7.14784e+08,
           160.600,  2.12494e+06,  5.79247e+08,
           180.600,  2.32938e+06,  6.34982e+08,
           180.610,         0.00,         0.00,
      1.00001e+07,         0.00,         0.00 $END
$LIST POOL=701,
                 0,  0,        1,  0,
            1.406e2,  0,        1,  0,
            1.406e2,  0,        0,  0,
             1.74e2,  0,        0,  0,
             1.74e2,  0,    0.094,  0,
            4.139e2,  0,    0.083,  0,
            4.189e2,  0,    0.480,  0,
             9.77e2,  0,    0.614,  0,
            4.954e3,  0,    0.723,  0,
           1.5154e4,  0,    0.890,  0,
           3.9540e4,  0,    0.904,  0,
           9.5540e4,  0,    0.993,  0,
           1.9954e5,  0,    0.782,  0,
           2.9754e5,  0,    0.588,  0,
           7.8885e5,  0,    0.636,  0,
          1.03385e6,  0,    0.820,  0,
```

```
          1.52885e6,  0,    0.655,  0,
          3.00885e6,  0,    0.776,  0,
          3.25855e6,  0,    0.736,  0,
          1.00001e7,  0,    0.736,  0 $END
$LIST POOL=801,
                0,          0,          0,      0,  100,  100,
               33,          0,          0,      0,  100,  100,
               35, 0.4973e+05,          0,      0,  100,  100,
               40, 1.2184e+05,          0,      0,  100,  100,
               45, 2.6357e+05,          0,      0,  100,  100,
               50, 3.0584e+05,          0,      0,  100,  100,
               55, 3.3567e+05,          0,      0,  100,  100,
               60, 7.9567e+05,          0,      0,  100,  100,
              174, 7.9567e+05,          0,      0,  100,  100,
              174, 7.9567e+05, 5.9321e+06,      0,  100,  100,
             1375, 7.9567e+05, 5.9321e+06,      0,  100,  100,
             1375, 9.3244e+05, 9.3200e+05,      0,    0,    0,
             7200, 9.3244e+05, 9.3200e+05,      0,    0,    0,
             7200, 9.3244e+05, 9.3200e+05,      0,    0,    0,
        1.00001e+7, 9.3244e+05, 9.3200e+05,     0,    0,    0 $END
$LIST POOL=901,
                0,          0,    0,
               90,          0,    0,
               90,   1.2874e6,  120,
              100,   1.2874e6,  120,
              100,          0,    0,
      1.00001e+07,          0,    0 $END
$LIST POOL=1001,
            0,  100,  2.0,
           24,  100,  2.0 $END
$LIST POOL=1101,
           105,      0.000,
           120,  1.637e+06,
           130,  2.960e+06,
           140,  4.479e+06,
           150,  6.194e+06,
           160,  8.105e+06,
           170,  1.0192e+07,
           180,  1.2475e+07,
           190,  1.4925e+07,
           200,  1.7522e+07,
           210,  2.0266e+07,
           220,  2.3138e+07,
           230,  2.6107e+07,
           240,  2.9145e+07,
           250,  3.2252e+07,
           260,  3.5388e+07,
           270,  3.8524e+07,
           280,  4.1670e+07,
           287,  4.3845e+07,
           290,  4.4776e+07,
           300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
           0.0,  0.729,
           0.1,  0.737,
           0.2,  0.747,
           0.3,  0.757,
           0.4,  0.771,
           0.5,  0.788,
           0.6,  0.809,
```

```
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

Case 6, DESLS LOCA w/ECU Train Failure

```
* CASE 6 - DESLS LOCA w/LOP&NoDG Failure (max SI) N-4080-026R1: 2ECUs & 2CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,17,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.95830e5,3259,0,120,174 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,13720,216,105,6.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
```

```
                8.6400E+04,  7.16199E+07,
               1.72800E+05,  5.88206E+07,
               2.59200E+05,  5.08008E+07,
               4.32000E+05,  4.10087E+07,
               6.91200E+05,  3.37355E+07,
              1.036800E+06,  2.89365E+07,
              2.592000E+06,  1.96478E+07,
              6.048000E+06,  1.24410E+07,
             1.0368000E+07,  9.14378E+06 $END
$LIST POOL=201,
                     0,  3.87909E7,
               1.406E2,  3.87909E7,
               1.406E2,          0,
                1.74E2,          0,
                1.74E2,  3.84045E8,
               4.139E2,  3.67844E8,
               4.189E2,  3.85443E7,
               1.577E3,  2.15289E7,
               4.954E3,  1.17494E7,
              1.5154E4,  6.00188E6,
              3.9540E4,  2.86224E6,
              9.5540E4,  9.65041E5,
              1.9954E5,  2.64549E5,
              2.9754E5,  1.21078E5,
              5.3885E5,  6.67163E4,
             1.03385E6,  9.78736E3,
             1.27885E6,  9.13763E3,
             1.52885E6,  5.19833E3,
             1.77385E6,  4.94590E3,
             2.26885E6,  7.20000E2,
             2.51385E6,  1.18800E3,
             2.75885E6,  4.68000E2,
             3.00885E6,  7.20000E2,
             3.25385E6,  5.04000E2,
             1.00001E7,  5.04000E2 $END
$LIST POOL=301,
                     0,          0,      0,
               0.0101591,  2.76290e+08,  555.06,
               0.0201591,  2.71945e+08,  554.21,
               0.0301591,  2.70278e+08,  553.61,
               0.0401591,  2.70214e+08,  553.37,
               0.0501591,  2.70331e+08,  553.40,
               0.0601591,  2.69700e+08,  553.53,
               0.0701591,  2.68210e+08,  553.69,
               0.0800991,  2.66522e+08,  553.89,
               0.0900991,  2.65138e+08,  554.08,
               0.100099,   2.64412e+08,  554.30,
               0.150099,   2.68953e+08,  555.89,
               0.200099,   2.70322e+08,  557.21,
               0.250099,   2.74895e+08,  558.27,
               0.300099,   2.74942e+08,  559.11,
               0.350099,   2.77154e+08,  559.92,
               0.400099,   2.76002e+08,  560.74,
               0.450099,   2.76795e+08,  561.52,
               0.500099,   2.75253e+08,  562.39,
               1.00010,    2.66197e+08,  571.16,
               1.50010,    2.49140e+08,  576.47,
               2.00010,    2.31010e+08,  579.68,
               2.50010,    2.05488e+08,  586.33,
               3.00010,    1.62033e+08,  609.52,
```

```
4.00082,    1.23496e+08,  629.33,
5.00082,    1.12250e+08,  638.75,
6.00082,    1.00938e+08,  654.69,
7.00082,    9.31147e+07,  658.07,
8.00082,    8.74523e+07,  656.30,
9.00082,    8.14244e+07,  662.20,
10.00080,   6.57601e+07,  719.48,
11.00080,   5.60322e+07,  756.46,
12.00440,   4.40165e+07,  800.42,
12.99970,   3.39326e+07,  730.84,
14.00430,   3.10272e+07,  674.77,
15.00430,   2.51280e+07,  656.55,
16.00190,   1.54538e+07,  706.73,
16.49970,   1.35041e+07,  704.97,
17.00020,   9.76676e+06,  769.16,
17.50240,   8.85420e+06,  741.36,
18.00060,   1.05321e+07,  570.22,
18.19980,   9.92243e+06,  575.85,
18.40250,   9.02380e+06,  597.71,
18.41000,   0.00000e+00,  597.71,
18.500,     5.02776e+05,  1293.36,
22.300,     3.37244e+06,  1276.23,
22.310,     1.68622e+06,  1276.23,
23.500,     1.70127e+06,  1269.89,
28.300,     1.71070e+06,  1257.17,
33.100,     1.70003e+06,  1251.87,
37.900,     1.68451e+06,  1248.29,
42.700,     1.66775e+06,  1245.15,
47.600,     1.65028e+06,  1242.09,
52.400,     1.63305e+06,  1239.13,
57.200,     1.61588e+06,  1236.19,
62.000,     1.59876e+06,  1233.22,
66.800,     1.58112e+06,  1230.19,
71.700,     1.56400e+06,  1227.05,
76.500,     1.54726e+06,  1223.97,
81.300,     1.53040e+06,  1221.30,
86.100,     1.41255e+06,  1204.79,
90.890,     1.31501e+06,  1205.91,
90.900,     2.63002e+06,  1205.91,
94.300,     2.50132e+06,  1206.73,
97.600,     2.38468e+06,  1207.48,
100.900,    2.27333e+06,  1208.21,
104.200,    2.16666e+06,  1208.91,
107.500,    2.06431e+06,  1209.60,
110.800,    1.96614e+06,  1210.29,
114.100,    1.87189e+06,  1210.99,
117.500,    1.77876e+06,  1211.72,
120.800,    1.69204e+06,  1212.44,
124.100,    1.60877e+06,  1213.19,
127.400,    1.52719e+06,  1214.04,
130.700,    1.44742e+06,  1214.87,
134.000,    1.37081e+06,  1215.79,
137.300,    1.29730e+06,  1216.73,
140.600,    1.22666e+06,  1217.73,
140.700,    1.22307e+06,  1205.88,
140.900,    1.19081e+06,  1240.48,
141.500,    1.16737e+06,  1203.69,
142.300,    1.15462e+06,  1238.36,
143.400,    1.13060e+06,  1212.05,
144.800,    1.10273e+06,  1233.74,
```

```
          146.500,      1.07058e+06,  1217.03,
          148.400,      1.03638e+06,  1232.87,
          150.600,      9.90454e+05,  1222.65,
          153.100,      1.18497e+06,  1207.69,
          155.900,      4.23662e+05,  1230.10,
          159.000,      1.05582e+06,  1209.04,
          162.300,      6.98101e+05,  1236.23,
          165.900,      7.91903e+05,  1228.68,
          169.800,      4.46864e+05,  1189.66,
          174.000,      5.47423e+05,  1227.23,
          174.010,            0.00,     0.00,
      1.00001e+07,            0.00,     0.00 $END
$LIST POOL=401,
                 0,  0,  0,
             1.74e2,  0,  0,
             1.74e2,  1,  0.906,
            4.139e2,  1,  0.917,
            4.189e2,  1,  0.552,
            1.577e3,  1,  0.408,
            4.954e3,  1,  0.256,
           1.5154e4,  1,  0.114,
           3.9540e4,  1,  0.096,
           9.5540e4,  1,  0.014,
           1.9954e5,  1,  0.211,
           2.9754e5,  1,  0.401,
           5.3885e5,  1,  0.674,
          1.03385e6,  1,  0.261,
          1.27885e6,  1,  0.209,
          1.52885e6,  1,  0.305,
          1.77385e6,  1,  0.269,
          2.26885e6,  1,  1.0,
          3.25385e6,  1,  1.0,
          1.00001e7,  1,  1.0 $END
$LIST POOL=501,
               0.0,  0,  0,
       1.00001e+07,  0,  0 $END
$LIST POOL=601,
               0.00,         0.00,         0.00,
             18.410,         0.00,         0.00,
             18.500,  2.51388e+05,  6.85609e+07,
             19.000,  5.06016e+05,  1.38006e+08,
             19.500,  5.69304e+05,  1.55266e+08,
             19.800,  6.93324e+05,  1.89090e+08,
             20.000,  7.99524e+05,  2.18054e+08,
             20.300,  9.42624e+05,  2.57082e+08,
             20.500,  1.03061e+06,  2.81078e+08,
             21.000,  1.23365e+06,  3.36453e+08,
             21.600,  1.45667e+06,  3.97278e+08,
             22.300,  3.73558e+07,  3.59879e+09,
             25.300,  3.35592e+07,  3.26901e+09,
             30.300,  2.89637e+07,  2.86182e+09,
             35.300,  2.55858e+07,  2.56432e+09,
             40.300,  2.29813e+07,  2.33200e+09,
             45.300,  2.08641e+07,  2.14241e+09,
             50.300,  1.90880e+07,  1.98281e+09,
             60.300,  1.62309e+07,  1.72477e+09,
             70.300,  1.39972e+07,  1.52157e+09,
             80.300,  1.21702e+07,  1.35433e+09,
             83.300,  1.17431e+07,  1.35368e+09,
             86.300,  1.13067e+07,  1.34779e+09,
```

```
            90.300,  1.07515e+07,  1.33787e+09,
            91.300,  1.00228e+06,  2.48180e+08,
            93.300,  1.05955e+06,  2.79703e+08,
            95.300,  1.15085e+06,  3.13713e+08,
            99.300,  1.39990e+06,  3.81607e+08,
           120.000,  2.19575e+06,  5.98558e+08,
           140.600,  2.62213e+06,  7.14784e+08,
           160.600,  2.12494e+06,  5.79247e+08,
           180.600,  2.32938e+06,  6.34982e+08,
           180.610,        0.00,        0.00,
          2.00e+07,        0.00,        0.00 $END
$LIST POOL=701,
                0,  0,       1,  0,
          1.406e2,  0,       1,  0,
          1.406e2,  0,       0,  0,
           1.74e2,  0,       0,  0,
           1.74e2,  0,   0.094,  0,
          4.139e2,  0,   0.083,  0,
          4.189e2,  0,   0.448,  0,
          1.577e3,  0,   0.592,  0,
          4.954e3,  0,   0.744,  0,
         1.5154e4,  0,   0.886,  0,
         3.9540e4,  0,   0.904,  0,
         9.5540e4,  0,   0.986,  0,
         1.9954e5,  0,   0.789,  0,
         2.9754e5,  0,   0.599,  0,
         5.3885e5,  0,   0.326,  0,
        1.03385e6,  0,   0.739,  0,
        1.27885e6,  0,   0.791,  0,
        1.77385e6,  0,   0.731,  0,
        2.26885e6,  0,   0.0,    0,
        1.00001e7,  0,   0.0,    0 $END
$LIST POOL=801,
               0,          0,          0,      0,  100,  100,
              33,          0,          0,      0,  100,  100,
              35,  0.9946e+05,         0,      0,  100,  100,
              40,  2.4368e+05,         0,      0,  100,  100,
              45,  5.2714e+05,         0,      0,  100,  100,
              50,  6.1168e+05,         0,      0,  100,  100,
              55,  6.7134e+05,         0,      0,  100,  100,
              60, 15.9134e+05,         0,      0,  100,  100,
             174, 15.9134e+05,         0,      0,  100,  100,
             174, 15.9134e+05, 5.9321e+06,     0,  100,  100,
            1236, 15.9134e+05, 5.9321e+06,     0,  100,  100,
            1236, 15.9134e+05, 9.3200e+05,     0,    0,    0,
            7200, 15.9134e+05, 9.3200e+05,     0,    0,    0,
            7200, 15.9134e+05, 9.3200e+05,     0,    0,    0,
        1.00001e+7, 15.9134e+05, 9.3200e+05,   0,    0,    0 $END
$LIST POOL=901,
               0,          0,    0,
              90,          0,    0,
              90,   1.2874e6,  120,
             100,   1.2874e6,  120,
             100,          0,    0,
      1.00001e+07,         0,    0 $END
$LIST POOL=1001,
            0,  100,  2.0,
           24,  100,  2.0 $END
$LIST POOL=1101,
           105,      0.000,
```

Originator's Note:
Containment spray flow kept at 1600 gpm/train instead of increasing to 1950 gpm/train at start of recirculation. Long-term cooldown is conservative for this non-limiting case 6.

```
            120,  1.637e+06,
            130,  2.960e+06,
            140,  4.479e+06,
            150,  6.194e+06,
            160,  8.105e+06,
            170,  1.0192e+07,
            180,  1.2475e+07,
            190,  1.4925e+07,
            200,  1.7522e+07,
            210,  2.0266e+07,
            220,  2.3138e+07,
            230,  2.6107e+07,
            240,  2.9145e+07,
            250,  3.2252e+07,
            260,  3.5388e+07,
            270,  3.8524e+07,
            280,  4.1670e+07,
            287,  4.3845e+07,
            290,  4.4776e+07,
            300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
            0.0,  0.729,
            0.1,  0.737,
            0.2,  0.747,
            0.3,  0.757,
            0.4,  0.771,
            0.5,  0.788,
            0.6,  0.809,
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

Case 7, DEHLS LOCA w/DG Failure

```
* CASE 7 - DEHLS LOCA w/DG Failure (min SI) N-4080-026R1: 2ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,11,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.72061e5,3259,0,2,12.2 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
              8.6400E+04,  7.16199E+07,
             1.72800E+05,  5.88206E+07,
             2.59200E+05,  5.08008E+07,
             4.32000E+05,  4.10087E+07,
             6.91200E+05,  3.37355E+07,
            1.036800E+06,  2.89365E+07,
            2.592000E+06,  1.96478E+07,
            6.048000E+06,  1.24410E+07,
           1.0368000E+07,  9.14378E+06 $END
 $LIST POOL=201,
                       0,  4.47049E8,
                  1.22E1,  4.47049E8,
                  1.22E1,  2.86825E9,
                  2.22E1,  2.86461E9,
                  3.22E1,  1.00942E9,
                  4.72E1,  9.33001E8,
                  5.72E1,  6.33103E8,
                 1.472E2,  6.23452E8,
                 1.522E2,  2.98048E8,
                 1.872E2,  2.95063E8,
                 1.922E2,  1.72512E7,
                 3.972E2,  7.53696E6,
                 9.430E2,  3.14460E6,
                 1.243E3,  3.19536E6,
                 5.086E3,  1.28664E6,
                1.4086E4,  3.16800E5,
                3.2860E4,  2.04120E5,
                5.2860E4,  1.02600E5,
                8.8860E4,  5.79600E4,
                1.9886E5,  1.90800E4,
                2.9686E5,  1.18800E4,
```

```
          7.8715E5,  6.84000E3,
         1.22715E6,  1.80000E3,
         3.25215E6,  5.40000E2,
         1.00001E7,  5.40000E2 $END
$LIST POOL=301,
                0,          0,      0,
        0.0103421,  6.27354e+08,  643.05,
        0.0202421,  6.02244e+08,  640.94,
        0.0307891,  6.08616e+08,  642.24,
        0.0401493,  5.48352e+08,  641.28,
        0.0499552,  4.76899e+08,  638.15,
        0.0599552,  4.95108e+08,  637.33,
        0.0699552,  5.28664e+08,  640.99,
        0.0799552,  5.06801e+08,  640.93,
        0.0899552,  4.99086e+08,  639.35,
        0.0999552,  5.29254e+08,  640.78,
        0.149955,   5.09058e+08,  641.86,
        0.199955,   4.72468e+08,  641.13,
        0.249955,   4.53560e+08,  640.96,
        0.299955,   4.26856e+08,  639.77,
        0.349955,   4.19393e+08,  638.70,
        0.399955,   4.06228e+08,  637.33,
        0.449955,   3.93149e+08,  636.55,
        0.499955,   3.85862e+08,  635.72,
        0.999955,   2.88242e+08,  645.34,
        1.49996,    2.64587e+08,  630.78,
        1.99996,    2.66148e+08,  611.46,
        2.49996,    2.46600e+08,  611.91,
        2.99996,    2.20959e+08,  628.09,
        4.00168,    1.88085e+08,  635.67,
        5.00168,    1.62186e+08,  642.94,
        6.00168,    1.26314e+08,  668.96,
        7.00322,    6.26681e+07,  933.15,
        8.00322,    4.88578e+07,  923.82,
        9.00322,    2.30701e+07, 1111.97,
       10.0024,     2.41007e+07,  981.82,
       10.2024,     2.23662e+07, 1006.48,
       10.4024,     2.02257e+07, 1021.58,
       10.6024,     1.73485e+07, 1034.34,
       10.8024,     1.23247e+07, 1100.95,
       11.0024,     7.76318e+06, 1207.09,
       11.1999,     5.11481e+06, 1225.42,
       11.4035,     4.37044e+06, 1233.57,
       11.6035,     3.80862e+06, 1226.16,
       11.8035,     3.16153e+06, 1228.38,
       12.0019,     2.49742e+06, 1229.31,
       12.2000,            0.00, 1229.31,
    1.00001e+07,           0.00,    0.00 $END
$LIST POOL=401,
                0,  0,  0,
            1.22e1,  0,  0,
            1.22e1,  1,  1,
         1.00001e7,  1,  1 $END
$LIST POOL=501,
              0.0,  0,  0,
     1.00001e+07,  0,  0 $END
$LIST POOL=601,
              0.00,         0.00,         0.00,
     1.00001e+07,          0.00,         0.00 $END
$LIST POOL=701,
```

```
                0,  0,        1,  0,
            1.22e1,  0,       1,  0,
            1.22e1,  0,       0,  0,
         1.00001e7,  0,       0,  0 $END
$LIST POOL=801,
                0,          0,          0,      0,  100,  100,
             12.2,          0,          0,      0,  100,  100,
             12.2,          0, 2.9661e+06,      0,  100,  100,
               33,          0, 2.9661e+06,      0,  100,  100,
               35, 0.4973e+05, 2.9661e+06,      0,  100,  100,
               40, 1.2184e+05, 2.9661e+06,      0,  100,  100,
               45, 2.6357e+05, 2.9661e+06,      0,  100,  100,
               50, 3.0584e+05, 2.9661e+06,      0,  100,  100,
               55, 3.3567e+05, 2.9661e+06,      0,  100,  100,
               60, 7.9567e+05, 2.9661e+06,      0,  100,  100,
             2401, 7.9567e+05, 2.9661e+06,      0,  100,  100,
             2401, 9.3244e+05, 4.6598e+05,      0,    0,    0,
             7200, 9.3244e+05, 4.6598e+05,      0,    0,    0,
             7200, 9.3244e+05, 4.6598e+05,    0.5,    0,    0,
        1.00001e+7, 9.3244e+05, 4.6598e+05,    0.5,    0,    0 $END
$LIST POOL=901,
                0,          0,    0,
               90,          0,    0,
               90,   1.2874e6,  120,
              100,   1.2874e6,  120,
              100,          0,    0,
      1.00001e+07,          0,    0 $END
$LIST POOL=1001,
            0,  100,  2.0,
           24,  100,  2.0 $END
$LIST POOL=1101,
          105,      0.000,
          120,  1.637e+06,
          130,  2.960e+06,
          140,  4.479e+06,
          150,  6.194e+06,
          160,  8.105e+06,
          170,  1.0192e+07,
          180,  1.2475e+07,
          190,  1.4925e+07,
          200,  1.7522e+07,
          210,  2.0266e+07,
          220,  2.3138e+07,
          230,  2.6107e+07,
          240,  2.9145e+07,
          250,  3.2252e+07,
          260,  3.5388e+07,
          270,  3.8524e+07,
          280,  4.1670e+07,
          287,  4.3845e+07,
          290,  4.4776e+07,
          300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
          0.0,  0.729,
          0.1,  0.737,
          0.2,  0.747,
          0.3,  0.757,
          0.4,  0.771,
          0.5,  0.788,
          0.6,  0.809,
```

```
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

Case 8, DEHLS LOCA w/CS Train Failure

```
* CASE 8 - DEHLS LOCA w/LOP&NoDG Failure (max SI) N-4080-026R1: 4ECUs & 1CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,11,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.72061e5,3259,0,2,12.2 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,6860,216,105,3.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,4,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
              8.6400E+04,  7.16199E+07,
```

```
          1.72800E+05,  5.88206E+07,
          2.59200E+05,  5.08008E+07,
          4.32000E+05,  4.10087E+07,
          6.91200E+05,  3.37355E+07,
         1.036800E+06,  2.89365E+07,
         2.592000E+06,  1.96478E+07,
         6.048000E+06,  1.24410E+07,
        1.0368000E+07,  9.14378E+06 $END
$LIST POOL=201,
                0,  4.47049E8,
            1.22E1,  4.47049E8,
            1.22E1,  2.86821E9,
            2.22E1,  2.86457E9,
            3.22E1,  1.00934E9,
            4.72E1,  9.32915E8,
            5.72E1,  6.34320E8,
           1.472E2,  6.24506E8,
           1.522E2,  2.99808E8,
           1.872E2,  2.96762E8,
           1.922E2,  1.97496E7,
           3.972E2,  9.76536E6,
           9.430E2,  4.90644E6,
           1.443E3,  4.79052E6,
           5.086E3,  1.65564E6,
          1.4086E4,  3.17160E5,
          3.2860E4,  1.54080E5,
          4.2860E4,  9.39600E4,
          8.8860E4,  3.85200E4,
          1.9886E5,  1.22400E4,
          2.9686E5,  8.28000E3,
          7.8715E5,  4.68000E3,
         1.03215E6,  1.72000E3,
         3.25215E6,  3.96000E2,
         1.00001E7,  3.96000E2 $END
$LIST POOL=301,
                0,          0,      0,
        0.0103421,  6.27354e+08,  643.05,
        0.0202421,  6.02244e+08,  640.94,
        0.0307891,  6.08616e+08,  642.24,
        0.0401493,  5.48352e+08,  641.28,
        0.0499552,  4.76899e+08,  638.15,
        0.0599552,  4.95108e+08,  637.33,
        0.0699552,  5.28664e+08,  640.99,
        0.0799552,  5.06801e+08,  640.93,
        0.0899552,  4.99086e+08,  639.35,
        0.0999552,  5.29254e+08,  640.78,
        0.149955,   5.09058e+08,  641.86,
        0.199955,   4.72468e+08,  641.13,
        0.249955,   4.53560e+08,  640.96,
        0.299955,   4.26856e+08,  639.77,
        0.349955,   4.19393e+08,  638.70,
        0.399955,   4.06228e+08,  637.33,
        0.449955,   3.93149e+08,  636.55,
        0.499955,   3.85862e+08,  635.72,
        0.999955,   2.88242e+08,  645.34,
        1.49996,    2.64587e+08,  630.78,
        1.99996,    2.66148e+08,  611.46,
        2.49996,    2.46600e+08,  611.91,
        2.99996,    2.20959e+08,  628.09,
        4.00168,    1.88085e+08,  635.67,
```

```
          5.00168,    1.62186e+08,  642.94,
          6.00168,    1.26314e+08,  668.96,
          7.00322,    6.26681e+07,  933.15,
          8.00322,    4.88578e+07,  923.82,
          9.00322,    2.30701e+07, 1111.97,
         10.0024,     2.41007e+07,  981.82,
         10.2024,     2.23662e+07, 1006.48,
         10.4024,     2.02257e+07, 1021.58,
         10.6024,     1.73485e+07, 1034.34,
         10.8024,     1.23247e+07, 1100.95,
         11.0024,     7.76318e+06, 1207.09,
         11.1999,     5.11481e+06, 1225.42,
         11.4035,     4.37044e+06, 1233.57,
         11.6035,     3.80862e+06, 1226.16,
         11.8035,     3.16153e+06, 1228.38,
         12.0019,     2.49742e+06, 1229.31,
         12.2000,            0.00, 1229.31,
     1.00001e+07,            0.00,    0.00 $END
$LIST POOL=401,
              0,  0,  0,
          1.22e1,  0,  0,
          1.22e1,  1,  1,
        1.00001e7,  1,  1 $END
$LIST POOL=501,
            0.0,  0,  0,
     1.00001e+07,  0,  0 $END
$LIST POOL=601,
           0.00,         0.00,         0.00,
     1.00001e+07,         0.00,         0.00 $END
$LIST POOL=701,
              0,  0,        1,  0,
          1.22e1,  0,        1,  0,
          1.22e1,  0,        0,  0,
        1.00001e7,  0,        0,  0 $END
$LIST POOL=801,
              0,         0,         0,      0,  100,  100,
           12.2,         0,         0,      0,  100,  100,
           12.2,         0, 5.9321e+06,      0,  100,  100,
             33,         0, 5.9321e+06,      0,  100,  100,
             35, 0.4973e+05, 5.9321e+06,      0,  100,  100,
             40, 1.2184e+05, 5.9321e+06,      0,  100,  100,
             45, 2.6357e+05, 5.9321e+06,      0,  100,  100,
             50, 3.0584e+05, 5.9321e+06,      0,  100,  100,
             55, 3.3567e+05, 5.9321e+06,      0,  100,  100,
             60, 7.9567e+05, 5.9321e+06,      0,  100,  100,
           1348, 7.9567e+05, 5.9321e+06,      0,  100,  100,
           1348, 9.3244e+05, 9.3200e+05,      0,    0,    0,
           7200, 9.3244e+05, 9.3200e+05,      0,    0,    0,
           7200, 9.3244e+05, 9.3200e+05,   0.25,    0,    0,
       1.00001e+7, 9.3244e+05, 9.3200e+05,   0.25,    0,    0 $END
$LIST POOL=901,
              0,         0,    0,
             90,         0,    0,
             90,  1.2874e6,  120,
            100,  1.2874e6,  120,
            100,         0,    0,
     1.00001e+07,         0,    0 $END
$LIST POOL=1001,
          0,  100,  2.0,
         24,  100,  2.0 $END
```

```
$LIST POOL=1101,
          105,      0.000,
          120,  1.637e+06,
          130,  2.960e+06,
          140,  4.479e+06,
          150,  6.194e+06,
          160,  8.105e+06,
          170,  1.0192e+07,
          180,  1.2475e+07,
          190,  1.4925e+07,
          200,  1.7522e+07,
          210,  2.0266e+07,
          220,  2.3138e+07,
          230,  2.6107e+07,
          240,  2.9145e+07,
          250,  3.2252e+07,
          260,  3.5388e+07,
          270,  3.8524e+07,
          280,  4.1670e+07,
          287,  4.3845e+07,
          290,  4.4776e+07,
          300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
          0.0,  0.729,
          0.1,  0.737,
          0.2,  0.747,
          0.3,  0.757,
          0.4,  0.771,
          0.5,  0.788,
          0.6,  0.809,
          0.7,  0.832,
          0.8,  0.863,
          0.9,  0.912,
          1.0,  0.961,
          1.1,  0.983,
          1.2,  0.995,
          1.3,  1.000 $END
 $LIST POOL=9001,
             1,  0.05,      0.1,  10,
            10,  0.05,      1.0,   9,
            20,  0.05,      1.0,  10,
           100,   0.1,      2.0,  10,
           300,   0.1,      5.0,  10,
           400,   0.1,     10.0,   5,
           600,   1.0,     20.0,   5,
          1200,   5.0,     50.0,   4,
          1400,   5.0,     20.0,   5,
          2400,   5.0,     50.0,   4,
          2500,   5.0,     20.0,   5,
         4e+03,  10.0,      100,   5,
         1e+04,  25.0,      500,   4,
         3e+04,  50.0,     2500,   4,
         1e+05,  50.0,     5000,   2,
         3e+05,  50.0,    25000,   4,
         1e+06,  50.0,   100000,   1,
         2e+06,  50.0,   250000,   4,
         4e+06,  50.0,   500000,   2,
         2e+07,  50.0,  1000000,   1 $END
 $LIST POOL=9999 $END
```

Case 9, DEHLS LOCA w/ECU Train Failure

```
* CASE 9 - DEHLS LOCA w/LOP&NoDG Failure (max SI) N-4080-026R1: 2ECUs & 2CS
 $LIST POOL=0,2,1,0,1 $END
 $LIST POOL=1,10000050,16.8,2.305e6,120,0.05,21,587.5,1,11,0.00,14.7,0.5 $END
 $LIST POOL=2,0,0,1.72061e5,3259,0,2,12.2 $END
 $LIST POOL=3, 0, 0, 0, 0, 0, 2E7, 0, 0, 0, 0 $END
 $LIST POOL=4,1,13720,216,105,6.0e6,0,0,0,0,0,0,0 $END
 $LIST POOL=5,2,60,2.0e7,0,0 $END
 $LIST POOL=6,0,0,0 $END
 $LEAK NOPEN=0 $END
 $LIST POOL=101,
                 1.0E+01,  1.40669E+09,
                 2.0E+01,  9.95691E+08,
                 3.0E+01,  7.85072E+08,
                 6.0E+01,  5.75572E+08,
                1.00E+02,  5.08637E+08,
                2.00E+02,  4.30510E+08,
                4.00E+02,  3.58179E+08,
               1.000E+03,  2.72813E+08,
               1.800E+03,  2.35686E+08,
               2.700E+03,  2.07082E+08,
               3.600E+03,  1.87376E+08,
               7.200E+03,  1.50229E+08,
              1.8000E+04,  1.18335E+08,
              3.6000E+04,  9.41483E+07,
              5.4000E+04,  8.21067E+07,
              7.2000E+04,  7.53054E+07,
              8.6400E+04,  7.16199E+07,
             1.72800E+05,  5.88206E+07,
             2.59200E+05,  5.08008E+07,
             4.32000E+05,  4.10087E+07,
             6.91200E+05,  3.37355E+07,
            1.036800E+06,  2.89365E+07,
            2.592000E+06,  1.96478E+07,
            6.048000E+06,  1.24410E+07,
           1.0368000E+07,  9.14378E+06 $END
 $LIST POOL=201,
                      0,  4.47049E8,
                 1.22E1,  4.47049E8,
                 1.22E1,  2.86821E9,
                 2.22E1,  2.86457E9,
                 3.22E1,  1.00934E9,
                 4.72E1,  9.32915E8,
                 5.72E1,  6.32999E8,
                1.472E2,  6.25338E8,
                1.522E2,  3.01187E8,
                1.872E2,  2.98102E8,
                1.922E2,  2.16936E7,
                3.972E2,  1.13782E7,
                9.430E2,  5.96124E6,
                1.243E3,  6.17976E6,
                5.086E3,  1.52172E6,
               1.4086E4,  3.38760E5,
               3.2860E4,  1.58760E5,
               4.2860E4,  9.21500E4,
               8.8860E4,  3.38400E4,
               1.9886E5,  1.11600E4,
               2.9686E5,  7.20000E3,
```

```
          7.8715E5,  3.96000E3,
         1.03215E6,  1.40400E3,
         3.25215E6,  2.88000E2,
         1.00001E7,  2.88000E2 $END
$LIST POOL=301,
                0,          0,      0,
        0.0103421,  6.27354e+08,  643.05,
        0.0202421,  6.02244e+08,  640.94,
        0.0307891,  6.08616e+08,  642.24,
        0.0401493,  5.48352e+08,  641.28,
        0.0499552,  4.76899e+08,  638.15,
        0.0599552,  4.95108e+08,  637.33,
        0.0699552,  5.28664e+08,  640.99,
        0.0799552,  5.06801e+08,  640.93,
        0.0899552,  4.99086e+08,  639.35,
        0.0999552,  5.29254e+08,  640.78,
        0.149955,   5.09058e+08,  641.86,
        0.199955,   4.72468e+08,  641.13,
        0.249955,   4.53560e+08,  640.96,
        0.299955,   4.26856e+08,  639.77,
        0.349955,   4.19393e+08,  638.70,
        0.399955,   4.06228e+08,  637.33,
        0.449955,   3.93149e+08,  636.55,
        0.499955,   3.85862e+08,  635.72,
        0.999955,   2.88242e+08,  645.34,
        1.49996,    2.64587e+08,  630.78,
        1.99996,    2.66148e+08,  611.46,
        2.49996,    2.46600e+08,  611.91,
        2.99996,    2.20959e+08,  628.09,
        4.00168,    1.88085e+08,  635.67,
        5.00168,    1.62186e+08,  642.94,
        6.00168,    1.26314e+08,  668.96,
        7.00322,    6.26681e+07,  933.15,
        8.00322,    4.88578e+07,  923.82,
        9.00322,    2.30701e+07, 1111.97,
       10.0024,     2.41007e+07,  981.82,
       10.2024,     2.23662e+07, 1006.48,
       10.4024,     2.02257e+07, 1021.58,
       10.6024,     1.73485e+07, 1034.34,
       10.8024,     1.23247e+07, 1100.95,
       11.0024,     7.76318e+06, 1207.09,
       11.1999,     5.11481e+06, 1225.42,
       11.4035,     4.37044e+06, 1233.57,
       11.6035,     3.80862e+06, 1226.16,
       11.8035,     3.16153e+06, 1228.38,
       12.0019,     2.49742e+06, 1229.31,
       12.2000,            0.00, 1229.31,
    1.00001e+07,           0.00,    0.00 $END
$LIST POOL=401,
                0,  0,  0,
            1.22e1,  0,  0,
            1.22e1,  1,  1,
         1.00001e7,  1,  1 $END
$LIST POOL=501,
              0.0,  0,  0,
      1.00001e+07,  0,  0 $END
$LIST POOL=601,
              0.00,         0.00,         0.00,
      1.00001e+07,         0.00,         0.00 $END
$LIST POOL=701,
```

```
                0,  0,        1,  0,
            1.22e1,  0,        1,  0,
            1.22e1,  0,        0,  0,
         1.00001e7,  0,        0,  0 $END
$LIST POOL=801,
                0,          0,          0,      0,  100,  100,
             12.2,          0,          0,      0,  100,  100,
             12.2,          0, 5.9321e+06,      0,  100,  100,
               33,          0, 5.9321e+06,      0,  100,  100,
               35,  0.9946e+05, 5.9321e+06,      0,  100,  100,
               40,  2.4368e+05, 5.9321e+06,      0,  100,  100,
               45,  5.2714e+05, 5.9321e+06,      0,  100,  100,
               50,  6.1168e+05, 5.9321e+06,      0,  100,  100,
               55,  6.7134e+05, 5.9321e+06,      0,  100,  100,
               60, 15.9134e+05, 5.9321e+06,      0,  100,  100,
             1212, 15.9134e+05, 5.9321e+06,      0,  100,  100,
             1212, 15.9134e+05, 9.3200e+05,      0,    0,    0,
             7200, 15.9134e+05, 9.3200e+05,      0,    0,    0,
             7200, 15.9134e+05, 9.3200e+05,   0.25,    0,    0,
        1.00001e+7, 15.9134e+05, 9.3200e+05,   0.25,    0,    0 $END
$LIST POOL=901,
                0,          0,    0,
               90,          0,    0,
               90,   1.2874e6,  120,
              100,   1.2874e6,  120,
              100,          0,    0,
      1.00001e+07,          0,    0 $END
$LIST POOL=1001,
            0,  100,  2.0,
           24,  100,  2.0 $END
$LIST POOL=1101,
           105,      0.000,
           120,  1.637e+06,
           130,  2.960e+06,
           140,  4.479e+06,
           150,  6.194e+06,
           160,  8.105e+06,
           170,  1.0192e+07,
           180,  1.2475e+07,
           190,  1.4925e+07,
           200,  1.7522e+07,
           210,  2.0266e+07,
           220,  2.3138e+07,
           230,  2.6107e+07,
           240,  2.9145e+07,
           250,  3.2252e+07,
           260,  3.5388e+07,
           270,  3.8524e+07,
           280,  4.1670e+07,
           287,  4.3845e+07,
           290,  4.4776e+07,
           300,  4.7844e+07 $END [98% DB ECU Performance]
$LIST POOL=1201,
           0.0,  0.729,
           0.1,  0.737,
           0.2,  0.747,
           0.3,  0.757,
           0.4,  0.771,
           0.5,  0.788,
           0.6,  0.809,
```

Originator's Note:
Containment spray flow kept at 1600 gpm/train instead of increasing to 1950 gpm/train at start of recirculation. Long-term cooldown is conservative for this non-limiting case 9.

```
            0.7,  0.832,
            0.8,  0.863,
            0.9,  0.912,
            1.0,  0.961,
            1.1,  0.983,
            1.2,  0.995,
            1.3,  1.000 $END
$LIST POOL=9001,
              1,  0.05,      0.1,  10,
             10,  0.05,      1.0,   9,
             20,  0.05,      1.0,  10,
            100,   0.1,      2.0,  10,
            300,   0.1,      5.0,  10,
            400,   0.1,     10.0,   5,
            600,   1.0,     20.0,   5,
           1200,   5.0,     50.0,   4,
           1400,   5.0,     20.0,   5,
           2400,   5.0,     50.0,   4,
           2500,   5.0,     20.0,   5,
          4e+03,  10.0,      100,   5,
          1e+04,  25.0,      500,   4,
          3e+04,  50.0,     2500,   4,
          1e+05,  50.0,     5000,   2,
          3e+05,  50.0,    25000,   4,
          1e+06,  50.0,   100000,   1,
          2e+06,  50.0,   250000,   4,
          4e+06,  50.0,   500000,   2,
          2e+07,  50.0,  1000000,   1 $END
$LIST POOL=9999 $END
```

9 COPATTA OUTPUT SUMMARY TABLES

TABLE 9-1A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 1

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.58	1.88	90.5	197.8	0.0
0.2	17.87	3.17	112.5	206.9	0.0
0.3	19.00	4.30	127.4	211.0	0.0
0.4	20.05	5.35	139.3	213.8	0.0
0.5	21.04	6.34	148.8	215.0	0.0
0.6	21.98	7.28	156.1	216.4	0.0
0.7	22.89	8.19	162.6	217.6	0.0
0.8	23.76	9.06	167.6	217.4	0.0
0.9	24.64	9.94	172.8	217.4	0.0
1	25.49	10.79	178.0	218.4	0.0
2	32.50	17.80	206.9	219.2	0.0
3	37.41	22.71	221.9	222.5	0.0
4	41.50	26.80	231.9	225.2	0.0
5	45.00	30.30	239.8	227.3	0.0
6	47.93	33.23	245.5	229.2	0.0
7	50.53	35.83	250.4	230.5	0.0
8	52.75	38.05	254.3	230.9	0.0
9	54.44	39.74	257.3	230.5	0.0
10	55.52	40.82	258.9	229.7	0.0
11	56.31	41.61	260.3	229.4	0.0
12	56.70	42.00	260.8	229.8	0.0
13	56.66	41.96	260.7	230.4	0.0
14	56.43	41.73	260.3	230.7	0.0
15	56.07	41.37	259.8	230.0	0.0
16	55.76	41.06	259.3	229.1	0.0
17	55.51	40.81	258.8	228.2	0.0
18	55.31	40.61	258.6	227.3	0.0
19	55.18	40.48	258.6	226.5	0.0
20	55.10	40.40	258.9	225.7	0.0
22	54.88	40.18	259.0	221.4	0.0
24	54.65	39.95	258.8	217.1	0.0
26	54.52	39.82	258.9	213.4	0.0
28	54.38	39.68	259.1	210.2	0.0
30	54.28	39.58	259.3	207.3	0.0
32	54.21	39.51	259.7	205.8	0.0
34	54.16	39.46	260.1	204.5	0.0
36	54.12	39.42	260.3	203.3	0.0
38	54.09	39.39	260.5	202.2	0.0
40	54.05	39.35	260.5	201.2	0.0
42	54.01	39.31	260.3	200.3	0.0
44	53.94	39.24	259.7	199.4	0.0
46	53.86	39.16	258.9	198.6	0.0
48	53.78	39.08	258.0	197.9	0.0
50	53.69	38.99	256.9	197.2	0.0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
	CCN CONVERSION: CCN NO. CCN --

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 164 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

52	53.60	38.90	255.8	196.6	0.0
54	53.58	38.88	255.8	196.0	0.0
56	53.56	38.86	255.7	195.5	0.0
58	53.54	38.84	255.7	195.0	0.0
60	53.52	38.82	255.7	194.5	0.0
62	53.49	38.79	255.6	194.1	0.0
64	53.46	38.76	255.5	193.7	0.0
66	53.44	38.74	255.5	193.4	0.0
68	53.42	38.72	255.5	193.0	0.0
70	53.40	38.70	255.5	192.7	0.0
72	53.38	38.68	255.4	192.5	0.0
74	53.36	38.66	255.4	192.4	0.0
76	53.35	38.65	255.3	192.4	0.0
78	53.37	38.67	255.4	192.5	0.0
80	53.51	38.81	255.7	192.6	0.0
82	53.66	38.96	255.9	192.7	0.0
84	53.79	39.09	256.1	192.8	0.0
86	53.92	39.22	256.3	192.9	0.0
88	54.00	39.30	256.4	193.0	0.0
90	54.14	39.44	256.8	193.1	0.0
92	54.35	39.65	256.9	193.1	0.0
94	54.56	39.86	257.1	193.2	0.0
96	54.77	40.07	257.3	193.3	0.0
98	54.97	40.27	257.5	193.4	0.0
100	55.17	40.47	257.7	193.5	0.0
105	55.46	40.76	258.2	193.7	0.0
110	55.73	41.03	258.6	193.9	0.0
115	56.00	41.30	259.0	194.1	0.0
120	56.25	41.55	259.5	194.3	0.0
125	56.50	41.80	259.8	194.5	0.0
130	56.74	42.04	260.2	194.7	0.0
135	56.98	42.28	260.6	194.9	0.0
140	57.21	42.51	260.9	195.1	0.0
145	57.45	42.75	261.3	195.3	0.0
150	57.68	42.98	261.6	195.5	0.0
155	57.91	43.21	262.0	195.7	0.0
160	58.13	43.43	262.3	195.9	0.0
165	58.32	43.62	262.6	196.1	0.0
170	58.54	43.84	263.0	196.3	0.0
175	58.78	44.08	263.4	196.4	0.0
180	59.00	44.30	263.6	196.6	0.0
185	59.22	44.52	264.0	196.8	0.0
190	59.41	44.71	264.2	197.0	0.0
195	59.55	44.85	264.4	197.2	0.0
200	59.71	45.01	264.7	197.4	0.0
205	59.86	45.16	264.9	197.7	0.0
210	59.97	45.27	265.0	198.0	0.0
215	60.07	45.37	265.2	198.3	0.0
220	60.16	45.46	265.3	198.6	0.0
225	60.23	45.53	265.4	198.9	0.0
230	60.29	45.59	265.5	199.3	0.0
235	60.35	45.65	265.6	199.7	0.0
240	60.40	45.70	265.6	200.1	0.0
245	60.45	45.75	265.7	200.6	0.0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 165 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

250	60.50	45.80	265.8	201.0	0.0
255	60.54	45.84	265.8	201.4	0.0
260	60.57	45.87	265.9	201.9	0.0
265	60.59	45.89	265.9	202.4	0.0
270	60.58	45.88	265.9	202.8	0.0
275	60.56	45.86	265.9	203.3	0.0
280	60.54	45.84	265.8	203.8	0.0
285	60.50	45.80	265.8	204.2	0.0
290	60.45	45.75	265.7	204.7	0.0
295	60.40	45.70	265.6	205.2	0.0
300	60.34	45.64	265.5	205.6	0.0
310	60.19	45.49	265.3	206.6	0.0
320	59.93	45.23	264.9	206.4	292.6
330	59.67	44.97	264.5	207.4	292.3
340	59.41	44.71	264.1	208.3	292.0
350	59.22	44.52	263.8	209.2	291.8
360	58.93	44.23	263.4	210.0	291.5
370	58.81	44.11	263.2	210.8	291.3
380	58.54	43.84	262.9	211.6	291.1
390	58.36	43.66	262.5	212.4	290.8
400	58.15	43.45	262.2	213.1	290.5
420	57.75	43.05	261.6	214.6	290.1
440	57.35	42.65	260.9	215.9	289.6
460	56.97	42.27	260.3	217.2	289.2
480	56.61	41.91	259.8	218.4	288.8
500	56.26	41.56	259.2	219.5	288.4
520	55.92	41.22	258.6	220.6	288.0
540	55.51	40.81	258.0	221.7	287.5
560	55.05	40.35	257.2	222.7	286.9
580	54.58	39.88	256.4	223.6	285.1
600	54.12	39.42	255.7	224.5	281.7
650	53.08	38.38	253.9	226.2	270.3
700	52.01	37.31	252.0	227.4	260.2
750	51.01	36.31	250.2	228.2	251.6
800	50.06	35.36	248.4	228.7	244.1
850	49.16	34.46	246.7	229.0	237.5
900	48.41	33.71	245.5	229.0	231.6
950	47.59	32.89	243.7	228.9	226.3
1000	46.82	32.12	242.1	228.6	221.6
1050	46.08	31.38	240.6	228.2	217.4
1100	45.37	30.67	239.1	227.8	213.8
1150	44.69	29.99	237.6	227.3	210.7
1200	44.04	29.34	236.2	226.7	208.0
1220	43.78	29.08	235.6	226.5	207.1
1240	43.53	28.83	235.0	226.2	206.1
1260	43.29	28.59	234.5	226.0	205.3
1280	43.11	28.41	234.2	225.7	204.4
1300	42.88	28.18	233.5	225.5	203.6
1320	42.64	27.94	233.0	225.3	202.9
1340	42.41	27.71	232.4	225.0	202.1
1360	42.18	27.48	231.9	224.7	201.4
1380	41.95	27.25	231.4	224.5	200.8
1400	41.72	27.02	230.8	224.2	200.1
1450	41.17	26.47	229.5	223.6	198.6

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

1500	40.64	25.94	228.2	222.9	197.2
1550	40.12	25.42	226.9	222.3	195.9
1600	39.63	24.93	225.6	221.6	194.7
1650	39.15	24.45	224.4	221.0	193.6
1700	38.69	23.99	223.1	220.4	192.5
1750	38.25	23.55	221.9	219.7	191.4
1800	37.82	23.12	220.7	219.1	190.4
1850	37.46	22.76	219.7	218.5	189.5
1900	37.05	22.35	218.5	217.9	188.6
1950	36.65	21.95	217.4	217.2	187.7
2000	36.26	21.56	216.2	216.6	186.9
2050	35.88	21.18	215.1	216.0	186.2
2100	35.51	20.81	214.0	215.4	185.5
2150	35.15	20.45	212.8	214.9	184.8
2200	34.81	20.11	211.8	214.3	184.1
2250	34.47	19.77	210.7	213.7	183.4
2300	34.15	19.45	209.6	213.2	182.8
2350	33.83	19.13	208.6	212.6	182.1
2400	33.53	18.83	207.5	212.0	181.5
2420	33.44	18.74	207.2	211.8	181.2
2440	33.33	18.63	206.8	211.7	182.7
2460	33.22	18.52	206.5	211.6	189.1
2480	33.12	18.42	206.1	211.6	195.5
2500	33.01	18.31	205.8	211.5	201.9
2600	32.51	17.81	204.0	211.3	232.3
2700	32.33	17.63	203.4	211.3	254.4
2800	32.98	18.28	205.7	211.1	255.6
2900	33.55	18.85	207.8	211.0	256.6
3000	34.00	19.30	209.1	210.9	257.4
3100	34.43	19.73	210.5	210.8	258.2
3200	34.81	20.11	211.6	210.8	258.9
3300	35.15	20.45	212.7	210.7	259.5
3400	35.45	20.75	213.6	210.7	260.0
3500	35.72	21.02	214.4	210.6	260.4
3600	35.95	21.25	215.1	210.6	260.8
3700	36.16	21.46	215.7	210.6	261.1
3800	36.36	21.66	216.3	210.5	261.4
3900	36.54	21.84	216.8	210.5	261.7
4000	36.71	22.01	217.3	210.5	262.0
4500	37.39	22.69	219.3	210.6	263.1
5000	37.82	23.12	220.4	210.7	263.8
5500	38.07	23.37	221.1	210.9	264.2
6000	38.22	23.52	221.6	211.1	264.4
6500	38.27	23.57	221.7	211.3	264.5
7000	38.22	23.52	221.5	211.5	264.4
7500	38.07	23.37	221.1	211.8	264.2
8000	37.91	23.21	220.7	212.1	263.9
8500	37.82	23.12	220.5	212.4	263.8
9000	37.70	23.00	220.1	212.6	263.6
9500	37.57	22.87	219.8	212.9	263.4
10000	37.45	22.75	219.4	213.1	263.2
12500	36.84	22.14	217.7	213.7	262.2
15000	36.14	21.44	215.7	213.8	261.1
17500	35.32	20.62	213.2	213.5	259.8

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 167 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

20000	34.56	19.86	210.8	212.8	258.5
22500	33.95	19.25	208.9	211.9	257.4
25000	33.42	18.72	207.1	210.8	256.5
27500	32.84	18.14	205.2	209.7	255.4
30000	32.28	17.58	203.2	208.5	254.4
35000	31.17	16.47	199.1	205.9	252.5
40000	30.20	15.50	195.4	203.2	250.7
45000	29.44	14.74	192.2	200.6	249.2
50000	28.77	14.07	189.4	198.3	247.8
55000	28.12	13.42	186.4	196.1	246.5
60000	27.58	12.88	183.9	194.0	245.4
65000	27.13	12.43	181.7	192.1	244.4
70000	26.73	12.03	179.7	190.5	243.6
75000	26.37	11.67	177.8	189.0	242.9
80000	26.07	11.37	176.2	187.6	242.3
85000	25.77	11.07	174.6	186.4	241.7
90000	25.52	10.82	173.2	185.3	241.1
95000	25.29	10.59	171.9	184.2	240.7
100000	25.10	10.40	170.8	183.3	240.3
125000	24.34	9.64	166.2	179.8	238.5
150000	23.71	9.01	162.0	177.1	237.0
175000	23.13	8.43	158.0	174.6	235.5
200000	22.68	7.98	154.7	172.3	234.5
225000	22.31	7.61	151.7	170.5	233.5
250000	21.97	7.27	149.0	168.8	232.7
275000	21.67	6.97	146.5	167.3	232.0
300000	21.44	6.74	144.4	166.0	231.4
400000	20.60	5.90	136.5	161.4	229.4
500000	20.03	5.33	130.5	157.8	228.0
600000	19.65	4.95	126.0	155.3	226.9
700000	19.29	4.59	121.6	152.8	225.8
800000	19.04	4.34	119.9	151.6	225.1
900000	18.91	4.21	118.2	150.2	224.5
1000000	18.81	4.11	117.0	148.3	220.4
1250000	18.65	3.95	113.0	145.2	212.9
1500000	18.60	3.90	112.3	142.9	207.0
1750000	18.63	3.93	114.4	140.7	201.2
2000000	18.59	3.89	113.8	138.7	195.5
2500000	18.49	3.79	111.5	134.6	184.1
3000000	18.45	3.75	110.8	132.5	178.6
3500000	18.47	3.77	112.2	131.1	174.6
4000000	18.45	3.75	111.8	129.6	170.6
5000000	18.40	3.70	111.0	126.7	162.6
6000000	18.34	3.64	110.3	123.7	154.5
7000000	18.33	3.63	109.9	122.5	151.2
8000000	18.29	3.59	109.6	121.4	148.3
9000050	18.28	3.58	109.3	120.3	145.3
10000050	18.25	3.55	109.0	119.2	142.3

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (311 seconds for Case 1)

COPATTA run I/O file: case1lca.dat/.lis

lcarslts.wb2

TABLE 9-1B: SUMMARY OF CONTAINMENT ENERGY AND CONTAINMENT HEAT REMOVAL HEAT TRANSFER FOR CASE 1

Time (seconds)	Steam Energy (Btu)	Air Energy (Btu)	Sump Energy (Btu)	Rx Vessel Energy (Btu)	Total Energy (Btu)	Integrated ECU Energy (Btu)	Integrated CS Ht Trans (Btu)	Heat Sink Net HT (Btu)	SDHX Duty (Btu/hr)	Integrated SDHX Ht Trans (Btu)
0.0	5.9619E+05	1.7809E+07	0.0000E+00	0	1.8405E+07	0	0	0.0000E+00	0	0
0.1	5.2037E+06	1.6902E+07	6.0448E+05	0	2.2710E+07	0	0	-5.9151E+02	0	0
0.2	9.7352E+06	1.7578E+07	2.0258E+06	0	2.9339E+07	0	0	-1.3299E+03	0	0
0.3	1.4409E+07	1.8022E+07	3.4402E+06	0	3.5872E+07	0	0	-1.2852E+03	0	0
0.4	1.9009E+07	1.8400E+07	4.8501E+06	0	4.2259E+07	0	0	8.7596E+02	0	0
0.5	2.3667E+07	1.8692E+07	6.2232E+06	0	4.8582E+07	0	0	5.9124E+03	0	0
0.6	2.8329E+07	1.8899E+07	7.5914E+06	0	5.4819E+07	0	0	1.3698E+04	0	0
0.7	3.2882E+07	1.9118E+07	8.9631E+06	0	6.0963E+07	0	0	2.4337E+04	0	0
0.8	3.7522E+07	1.9269E+07	1.0222E+07	0	6.7013E+07	0	0	3.7807E+04	0	0
0.9	4.2048E+07	1.9432E+07	1.1488E+07	0	7.2968E+07	0	0	5.4565E+04	0	0.
1	4.6418E+07	1.9591E+07	1.2819E+07	0	7.8828E+07	0	0	7.4960E+04	0	0
2	8.3941E+07	2.0479E+07	2.3213E+07	0	1.2763E+08	0	0	4.9118E+05	0	0
3	1.1056E+08	2.0940E+07	3.1507E+07	0	1.6301E+08	0	0	1.2804E+06	0	0
4	1.3280E+08	2.1219E+07	3.8513E+07	0	1.9253E+08	0	0	2.4037E+06	0	0
5	1.5201E+08	2.1489E+07	4.4138E+07	0	2.1764E+08	0	0	3.8246E+06	0	0
6	1.6821E+08	2.1661E+07	4.9008E+07	0	2.3888E+08	0	0	5.4987E+06	0	0
7	1.8219E+08	2.1814E+07	5.3431E+07	0	2.5743E+08	0	0	7.3767E+06	0	0
8	1.9402E+08	2.1913E+07	5.6842E+07	0	2.7277E+08	0	0	9.4135E+06	0	0
9	2.0354E+08	2.1980E+07	5.8831E+07	0	2.8435E+08	0	0	1.1559E+07	0	0
10	2.0935E+08	2.2029E+07	6.0054E+07	0	2.9143E+08	0	0	1.3762E+07	0	0
11	2.1353E+08	2.2118E+07	6.1886E+07	0	2.9753E+08	0	0	1.5979E+07	0	0
12	2.1560E+08	2.2136E+07	6.4739E+07	0	3.0247E+08	0	0	1.8172E+07	0	0
13	2.1534E+08	2.2132E+07	6.7817E+07	0	3.0529E+08	0	0	2.0222E+07	0	0
14	2.1408E+08	2.2112E+07	7.0565E+07	0	3.0676E+08	0	0	2.2070E+07	0	0
15	2.1217E+08	2.2087E+07	7.1637E+07	0	3.0590E+08	0	0	2.3748E+07	0	0
16	2.1049E+08	2.2081E+07	7.2375E+07	0	3.0495E+08	0	0	2.5282E+07	0	0
17	2.0913E+08	2.2071E+07	7.3085E+07	0	3.0428E+08	0	0	2.6695E+07	0	0
18	2.0805E+08	2.2066E+07	7.3784E+07	0	3.0390E+08	0	0	2.8004E+07	0	0
19	2.0722E+08	2.2067E+07	7.4478E+07	0	3.0376E+08	0	0	2.9225E+07	0	0
20	2.0661E+08	2.2075E+07	7.5166E+07	0	3.0386E+08	0	0	3.0370E+07	0	0
22	2.0526E+08	2.2078E+07	7.7465E+07	0	3.0480E+08	0	0	3.2465E+07	0	0
24	2.0390E+08	2.2072E+07	7.9844E+07	0	3.0581E+08	0	0	3.4331E+07	0	0
26	2.0276E+08	2.2077E+07	8.2112E+07	0	3.0695E+08	0	0	3.6009E+07	0	0
28	2.0182E+08	2.2081E+07	8.4286E+07	0	3.0818E+08	0	0	3.7526E+07	0	0
30	2.0104E+08	2.2088E+07	8.6375E+07	0	3.0950E+08	0	0	3.8904E+07	0	0
32	2.0041E+08	2.2099E+07	8.7742E+07	0	3.1025E+08	0	0	4.0158E+07	0	0
34	1.9991E+08	2.2111E+07	8.9042E+07	0	3.1107E+08	0	5.3260E+02	4.1303E+07	0	0
36	1.9954E+08	2.2118E+07	9.0280E+07	0	3.1194E+08	0	4.5740E+03	4.2349E+07	0	0
38	1.9926E+08	2.2122E+07	9.1467E+07	0	3.1285E+08	0	1.1319E+04	4.3323E+07	0	0
40	1.9901E+08	2.2122E+07	9.2617E+07	0	3.1375E+08	0	2.0542E+04	4.4276E+07	0	0
42	1.9878E+08	2.2114E+07	9.3731E+07	0	3.1463E+08	0	3.3425E+04	4.5210E+07	0	0
44	1.9859E+08	2.2096E+07	9.4815E+07	0	3.1550E+08	0	5.1125E+04	4.6126E+07	0	0
46	1.9843E+08	2.2070E+07	9.5867E+07	0	3.1637E+08	0	7.3154E+04	4.7022E+07	0	0

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

										0
48	1.9829E+08	2.2040E+07	9.6890E+07	0	3.1722E+08	0	9.6911E+04	4.7900E+07	0	0
50	1.9818E+08	2.2008E+07	9.7887E+07	0	3.1807E+08	0	1.2194E+05	4.8760E+07	0	0
52	1.9808E+08	2.1974E+07	9.8857E+07	0	3.1892E+08	0	1.4801E+05	4.9603E+07	0	0
54	1.9794E+08	2.1979E+07	9.9833E+07	0	3.1975E+08	0	1.7497E+05	5.0429E+07	0	0
56	1.9781E+08	2.1978E+07	1.0079E+08	0	3.2058E+08	0	2.0470E+05	5.1240E+07	0	0
58	1.9770E+08	2.1964E+07	1.0175E+08	0	3.2141E+08	0	2.4793E+05	5.2037E+07	0	0
60	1.9755E+08	2.1976E+07	1.0271E+08	0	3.2223E+08	1.8848E+03	3.0644E+05	5.2819E+07	0	0
62	1.9738E+08	2.1973E+07	1.0367E+08	0	3.2302E+08	3.9572E+04	3.7257E+05	5.3587E+07	0	0
64	1.9722E+08	2.1973E+07	1.0461E+08	0	3.2380E+08	7.7241E+04	4.3866E+05	5.4341E+07	0	0
66	1.9707E+08	2.1968E+07	1.0554E+08	0	3.2458E+08	1.1490E+05	5.0474E+05	5.5082E+07	0	0
68	1.9693E+08	2.1970E+07	1.0644E+08	0	3.2535E+08	1.5254E+05	5.7076E+05	5.5811E+07	0	0
70	1.9681E+08	2.1970E+07	1.0733E+08	0	3.2611E+08	1.9016E+05	6.3678E+05	5.6526E+07	0	0
72	1.9670E+08	2.1967E+07	1.0817E+08	0	3.2684E+08	2.2778E+05	7.0277E+05	5.7230E+07	0	0
74	1.9660E+08	2.1968E+07	1.0891E+08	0	3.2748E+08	2.6538E+05	7.6874E+05	5.7922E+07	0	0
76	1.9652E+08	2.1965E+07	1.0952E+08	0	3.2800E+08	3.0298E+05	8.3470E+05	5.8603E+07	0	0
78	1.9662E+08	2.1956E+07	1.1000E+08	0	3.2858E+08	3.4057E+05	9.0063E+05	5.9273E+07	0	0
80	1.9739E+08	2.1966E+07	1.1027E+08	0	3.2962E+08	3.7821E+05	9.6668E+05	5.9937E+07	0	0
82	1.9815E+08	2.1965E+07	1.1051E+08	0	3.3063E+08	4.1594E+05	1.0329E+06	6.0597E+07	0	0
84	1.9888E+08	2.1973E+07	1.1076E+08	0	3.3161E+08	4.5374E+05	1.0993E+06	6.1252E+07	0	0
86	1.9959E+08	2.1991E+07	1.1100E+08	0	3.3258E+08	4.9163E+05	1.1658E+06	6.1904E+07	0	0
88	2.0028E+08	2.2000E+07	1.1125E+08	0	3.3353E+08	5.2959E+05	1.2324E+06	6.2550E+07	0	0
90	2.0099E+08	2.1991E+07	1.1149E+08	0	3.3447E+08	5.6761E+05	1.2992E+06	6.3190E+07	0	0
92	2.0167E+08	2.2092E+07	1.1173E+08	0	3.3549E+08	6.0570E+05	1.3661E+06	6.3825E+07	0	0
94	2.0233E+08	2.2197E+07	1.1197E+08	0	3.3650E+08	6.4387E+05	1.4331E+06	6.4455E+07	0	0
96	2.0300E+08	2.2280E+07	1.1221E+08	0	3.3749E+08	6.8212E+05	1.5002E+06	6.5078E+07	0	0
98	2.0364E+08	2.2380E+07	1.1245E+08	0	3.3847E+08	7.2043E+05	1.5674E+06	6.5695E+07	0	0
100	2.0428E+08	2.2478E+07	1.1269E+08	0	3.3944E+08	7.5882E+05	1.6346E+06	6.6307E+07	0	0
105	2.0579E+08	2.2493E+07	1.1328E+08	0	3.4157E+08	8.5510E+05	1.8031E+06	6.7813E+07	0	0
110	2.0725E+08	2.2499E+07	1.1388E+08	0	3.4362E+08	9.5179E+05	1.9723E+06	6.9288E+07	0	0
115	2.0865E+08	2.2512E+07	1.1447E+08	0	3.4563E+08	1.0489E+06	2.1423E+06	7.0734E+07	0	0
120	2.0999E+08	2.2532E+07	1.1506E+08	0	3.4758E+08	1.1463E+06	2.3130E+06	7.2149E+07	0	0
125	2.1130E+08	2.2545E+07	1.1564E+08	0	3.4949E+08	1.2442E+06	2.4843E+06	7.3533E+07	0	0
130	2.1259E+08	2.2551E+07	1.1622E+08	0	3.5137E+08	1.3423E+06	2.6563E+06	7.4887E+07	0	0
135	2.1385E+08	2.2568E+07	1.1680E+08	0	3.5322E+08	1.4408E+06	2.8290E+06	7.6211E+07	0	0
140	2.1510E+08	2.2579E+07	1.1737E+08	0	3.5505E+08	1.5396E+06	3.0022E+06	7.7507E+07	0	0
145	2.1633E+08	2.2590E+07	1.1794E+08	0	3.5686E+08	1.6387E+06	3.1761E+06	7.8775E+07	0	0
150	2.1755E+08	2.2600E+07	1.1851E+08	0	3.5866E+08	1.7381E+06	3.3507E+06	8.0017E+07	0	0
155	2.1877E+08	2.2612E+07	1.1907E+08	0	3.6045E+08	1.8378E+06	3.5258E+06	8.1235E+07	0	0
160	2.1998E+08	2.2621E+07	1.1963E+08	0	3.6223E+08	1.9378E+06	3.7016E+06	8.2429E+07	0	0
165	2.2119E+08	2.2626E+07	1.2019E+08	0	3.6400E+08	2.0380E+06	3.8778E+06	8.3600E+07	0	0
170	2.2240E+08	2.2642E+07	1.2074E+08	0	3.6578E+08	2.1386E+06	4.0546E+06	8.4746E+07	0	0
175	2.2363E+08	2.2638E+07	1.2129E+08	0	3.6755E+08	2.2394E+06	4.2319E+06	8.5873E+07	0	0
180	2.2484E+08	2.2660E+07	1.2183E+08	0	3.6933E+08	2.3406E+06	4.4097E+06	8.6981E+07	0	0
185	2.2603E+08	2.2677E+07	1.2238E+08	0	3.7109E+08	2.4420E+06	4.5880E+06	8.8070E+07	0	0
190	2.2713E+08	2.2680E+07	1.2294E+08	0	3.7274E+08	2.5437E+06	4.7667E+06	8.9140E+07	0	0
195	2.2812E+08	2.2665E+07	1.2350E+08	0	3.7429E+08	2.6457E+06	4.9457E+06	9.0189E+07	0	0
200	2.2897E+08	2.2676E+07	1.2407E+08	0	3.7572E+08	2.7478E+06	5.1251E+06	9.1215E+07	0	0
205	2.2971E+08	2.2674E+07	1.2481E+08	0	3.7719E+08	2.8502E+06	5.3048E+06	9.2222E+07	0	0
210	2.3033E+08	2.2692E+07	1.2557E+08	0	3.7859E+08	2.9527E+06	5.4848E+06	9.3207E+07	0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE ___ OF ___
CCN CONVERSION: CCN NO. CCN –	

Project or DCP/FCN SONGS 2 & 3 Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 170 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

215	2.3086E+08	2.2696E+07	1.2637E+08	0	3.7992E+08	3.0553E+06	5.6650E+06	9.4171E+07	0	0
220	2.3129E+08	2.2716E+07	1.2719E+08	0	3.8120E+08	3.1581E+06	5.8454E+06	9.5114E+07	0	0
225	2.3164E+08	2.2706E+07	1.2807E+08	0	3.8241E+08	3.2610E+06	6.0260E+06	9.6035E+07	0	0
230	2.3196E+08	2.2715E+07	1.2901E+08	0	3.8368E+08	3.3639E+06	6.2067E+06	9.6935E+07	0	0
235	2.3226E+08	2.2722E+07	1.3001E+08	0	3.8500E+08	3.4670E+06	6.3875E+06	9.7815E+07	0	0
240	2.3254E+08	2.2727E+07	1.3108E+08	0	3.8635E+08	3.5701E+06	6.5685E+06	9.8676E+07	0	0
245	2.3280E+08	2.2721E+07	1.3220E+08	0	3.8772E+08	3.6733E+06	6.7496E+06	9.9519E+07	0	0
250	2.3302E+08	2.2731E+07	1.3333E+08	0	3.8907E+08	3.7765E+06	6.9307E+06	1.0034E+08	0	0
255	2.3321E+08	2.2726E+07	1.3447E+08	0	3.9041E+08	3.8798E+06	7.1120E+06	1.0115E+08	0	0
260	2.3336E+08	2.2733E+07	1.3564E+08	0	3.9174E+08	3.9832E+06	7.2933E+06	1.0194E+08	0	0
265	2.3346E+08	2.2732E+07	1.3682E+08	0	3.9302E+08	4.0865E+06	7.4747E+06	1.0272E+08	0	0
270	2.3343E+08	2.2735E+07	1.3803E+08	0	3.9420E+08	4.1899E+06	7.6561E+06	1.0348E+08	0	0
275	2.3332E+08	2.2734E+07	1.3927E+08	0	3.9532E+08	4.2933E+06	7.8375E+06	1.0422E+08	0	0
280	2.3317E+08	2.2729E+07	1.4052E+08	0	3.9642E+08	4.3966E+06	8.0188E+06	1.0494E+08	0	0
285	2.3296E+08	2.2729E+07	1.4179E+08	0	3.9748E+08	4.4999E+06	8.2001E+06	1.0564E+08	0	0
290	2.3269E+08	2.2726E+07	1.4307E+08	0	3.9848E+08	4.6032E+06	8.3812E+06	1.0633E+08	0	0
295	2.3237E+08	2.2722E+07	1.4435E+08	0	3.9944E+08	4.7064E+06	8.5622E+06	1.0701E+08	0	0
300	2.3204E+08	2.2714E+07	1.4563E+08	0	4.0038E+08	4.8095E+06	8.7431E+06	1.0766E+08	0	0
310	2.3124E+08	2.2711E+07	1.4822E+08	0	4.0217E+08	5.0154E+06	9.1045E+06	1.0894E+08	0	0
320	2.2981E+08	2.2686E+07	1.5253E+08	4.9108E+07	4.5414E+08	5.2208E+06	9.4650E+06	1.1015E+08	0	0
330	2.2837E+08	2.2679E+07	1.5543E+08	4.9057E+07	4.5553E+08	5.4254E+06	9.8242E+06	1.1129E+08	0	0
340	2.2699E+08	2.2670E+07	1.5829E+08	4.9008E+07	4.5696E+08	5.6294E+06	1.0182E+07	1.1239E+08	0	0
350	2.2565E+08	2.2665E+07	1.6115E+08	4.8965E+07	4.5842E+08	5.8327E+06	1.0539E+07	1.1343E+08	0	0
360	2.2438E+08	2.2646E+07	1.6398E+08	4.8916E+07	4.5992E+08	6.0354E+06	1.0895E+07	1.1443E+08	0	0
370	2.2307E+08	2.2650E+07	1.6682E+08	4.8891E+07	4.6144E+08	6.2376E+06	1.1251E+07	1.1539E+08	0	0
380	2.2186E+08	2.2631E+07	1.6964E+08	4.8848E+07	4.6298E+08	6.4393E+06	1.1605E+07	1.1633E+08	0	0
390	2.2065E+08	2.2629E+07	1.7245E+08	4.8805E+07	4.6453E+08	6.6404E+06	1.1958E+07	1.1724E+08	0	0
400	2.1947E+08	2.2628E+07	1.7525E+08	4.8764E+07	4.6611E+08	6.8409E+06	1.2310E+07	1.1812E+08	0	0
420	2.1730E+08	2.2522E+07	1.8081E+08	4.8689E+07	4.6932E+08	7.2404E+06	1.3012E+07	1.1980E+08	0	0
440	2.1513E+08	2.2510E+07	1.8635E+08	4.8612E+07	4.7261E+08	7.6377E+06	1.3708E+07	1.2139E+08	0	0
460	2.1307E+08	2.2489E+07	1.9187E+08	4.8539E+07	4.7596E+08	8.0330E+06	1.4401E+07	1.2290E+08	0	0
480	2.1109E+08	2.2472E+07	1.9735E+08	4.8469E+07	4.7938E+08	8.4263E+06	1.5089E+07	1.2434E+08	0	0
500	2.0918E+08	2.2456E+07	2.0281E+08	4.8401E+07	4.8284E+08	8.8176E+06	1.5774E+07	1.2570E+08	0	0
520	2.0731E+08	2.2439E+07	2.0824E+08	4.8336E+07	4.8633E+08	9.2070E+06	1.6454E+07	1.2701E+08	0	0
540	2.0508E+08	2.2487E+07	2.1375E+08	4.8263E+07	4.8959E+08	9.5943E+06	1.7131E+07	1.2825E+08	0	0
560	2.0260E+08	2.2463E+07	2.1931E+08	4.8164E+07	4.9254E+08	9.9789E+06	1.7803E+07	1.2942E+08	0	0
580	2.0004E+08	2.2438E+07	2.2483E+08	4.7864E+07	4.9518E+08	1.0361E+07	1.8469E+07	1.3053E+08	0	0
600	1.9753E+08	2.2414E+07	2.3025E+08	4.7295E+07	4.9749E+08	1.0740E+07	1.9130E+07	1.3159E+08	0	0
650	1.9136E+08	2.2360E+07	2.4338E+08	4.5334E+07	5.0243E+08	1.1677E+07	2.0751E+07	1.3407E+08	0	0
700	1.8556E+08	2.2301E+07	2.5597E+08	4.3618E+07	5.0745E+08	1.2598E+07	2.2329E+07	1.3631E+08	0	0
750	1.8010E+08	2.2244E+07	2.6811E+08	4.2123E+07	5.1258E+08	1.3503E+07	2.3865E+07	1.3834E+08	0	0
800	1.7494E+08	2.2189E+07	2.7986E+08	4.0813E+07	5.1780E+08	1.4393E+07	2.5362E+07	1.4020E+08	0	0
850	1.7007E+08	2.2136E+07	2.9125E+08	3.9654E+07	5.2311E+08	1.5268E+07	2.6821E+07	1.4188E+08	0	0
900	1.6561E+08	2.1939E+07	3.0230E+08	3.8618E+07	5.2846E+08	1.6127E+07	2.8245E+07	1.4343E+08	0	0
950	1.6099E+08	2.2040E+07	3.1312E+08	3.7685E+07	5.3384E+08	1.6975E+07	2.9638E+07	1.4486E+08	0	0
1000	1.5677E+08	2.1991E+07	3.2366E+08	3.6832E+07	5.3925E+08	1.7808E+07	3.0999E+07	1.4617E+08	0	0
1050	1.5272E+08	2.1942E+07	3.3396E+08	3.6077E+07	5.4470E+08	1.8629E+07	3.2335E+07	1.4738E+08	0	0
1100	1.4885E+08	2.1895E+07	3.4405E+08	3.5431E+07	5.5023E+08	1.9437E+07	3.3648E+07	1.4850E+08	0	0
1150	1.4513E+08	2.1849E+07	3.5397E+08	3.4873E+07	5.5583E+08	2.0232E+07	3.4937E+07	1.4952E+08	0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE ___ OF ___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 171 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

									0	0
									0	0
									0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN –	

Project or DCP/FCN SONGS 2 & 3 Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 172 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

3900	9.8939E+07	2.1201E+07	5.7164E+08	4.3895E+07	7.3568E+08	5.3620E+07	8.4317E+07	1.7163E+08	6.9401E+07	2.8337E+07
4000	9.9821E+07	2.1218E+07	5.7149E+08	4.3942E+07	7.3647E+08	5.4853E+07	8.5956E+07	1.7298E+08	6.9397E+07	3.0264E+07
4500	1.0339E+08	2.1263E+07	5.7105E+08	4.4125E+07	7.3983E+08	6.1113E+07	9.4306E+07	1.7971E+08	6.9420E+07	3.9904E+07
5000	1.0563E+08	2.1383E+07	5.7111E+08	4.4249E+07	7.4237E+08	6.7497E+07	1.0285E+08	1.8638E+08	6.9502E+07	4.9551E+07
5500	1.0731E+08	2.1333E+07	5.7140E+08	4.4315E+07	7.4436E+08	7.3949E+07	1.1150E+08	1.9277E+08	6.9616E+07	5.9212E+07
6000	1.0813E+08	2.1345E+07	5.7194E+08	4.4359E+07	7.4577E+08	8.0451E+07	1.2021E+08	1.9893E+08	6.9751E+07	6.8890E+07
6500	1.0836E+08	2.1342E+07	5.7261E+08	4.4372E+07	7.4668E+08	8.6975E+07	1.2896E+08	2.0480E+08	6.9896E+07	7.8588E+07
7000	1.0811E+08	2.1321E+07	5.7336E+08	4.4360E+07	7.4715E+08	9.3500E+07	1.3770E+08	2.1034E+08	7.0042E+07	8.8307E+07
7500	1.0729E+08	2.1300E+07	5.7442E+08	4.4319E+07	7.4733E+08	1.0000E+08	1.4639E+08	2.1552E+08	7.0229E+07	9.8047E+07
8000	1.0646E+08	2.1292E+07	5.7554E+08	4.4275E+07	7.4756E+08	1.0647E+08	1.5502E+08	2.2037E+08	7.0432E+07	1.0782E+08
8500	1.0566E+08	2.1311E+07	5.7655E+08	4.4252E+07	7.4777E+08	1.1290E+08	1.6360E+08	2.2502E+08	7.0613E+07	1.1761E+08
9000	1.0500E+08	2.1240E+07	5.7746E+08	4.4218E+07	7.4792E+08	1.1932E+08	1.7213E+08	2.2950E+08	7.0778E+07	1.2743E+08
9500	1.0434E+08	2.1232E+07	5.7828E+08	4.4183E+07	7.4803E+08	1.2570E+08	1.8062E+08	2.3378E+08	7.0924E+07	1.3727E+08
10000	1.0369E+08	2.1225E+07	5.7900E+08	4.4150E+07	7.4807E+08	1.3206E+08	1.8905E+08	2.3790E+08	7.1073E+07	1.4713E+08
12500	1.0049E+08	2.1169E+07	5.8154E+08	4.3984E+07	7.4719E+08	1.6347E+08	2.3051E+08	2.5654E+08	7.1488E+07	1.9666E+08
15000	9.6853E+07	2.1100E+07	5.8256E+08	4.3795E+07	7.4431E+08	1.9417E+08	2.7079E+08	2.7237E+08	7.1582E+07	2.4635E+08
17500	9.2553E+07	2.1040E+07	5.8226E+08	4.3570E+07	7.3942E+08	2.2405E+08	3.0978E+08	2.8575E+08	7.1386E+07	2.9601E+08
20000	8.8548E+07	2.0976E+07	5.8065E+08	4.3344E+07	7.3351E+08	2.5295E+08	3.4739E+08	2.9692E+08	7.0910E+07	3.4543E+08
22500	8.5381E+07	2.0918E+07	5.7814E+08	4.3156E+07	7.2760E+08	2.8097E+08	3.8393E+08	3.0685E+08	7.0300E+07	3.9446E+08
25000	8.2379E+07	2.0836E+07	5.7522E+08	4.2989E+07	7.2143E+08	3.0825E+08	4.1956E+08	3.1581E+08	6.9610E+07	4.4304E+08
27500	7.9395E+07	2.0792E+07	5.7203E+08	4.2812E+07	7.1503E+08	3.3484E+08	4.5431E+08	3.2380E+08	6.8867E+07	4.9112E+08
30000	7.6465E+07	2.0731E+07	5.6858E+08	4.2637E+07	7.0841E+08	3.6072E+08	4.8817E+08	3.3084E+08	6.8074E+07	5.3867E+08
35000	7.0691E+07	2.0608E+07	5.6112E+08	4.2291E+07	6.9471E+08	4.1026E+08	5.5317E+08	3.4214E+08	6.6381E+07	6.3204E+08
40000	6.5563E+07	2.0499E+07	5.5316E+08	4.1989E+07	6.8121E+08	4.5680E+08	6.1465E+08	3.5054E+08	6.4610E+07	7.2299E+08
45000	6.1621E+07	2.0406E+07	5.4536E+08	4.1725E+07	6.6911E+08	5.0095E+08	6.7336E+08	3.5730E+08	6.2795E+07	8.1144E+08
50000	5.8164E+07	2.0316E+07	5.3817E+08	4.1485E+07	6.5813E+08	5.4291E+08	7.2977E+08	3.6258E+08	6.1237E+07	8.9755E+08
55000	5.4699E+07	2.0219E+07	5.3150E+08	4.1249E+07	6.4767E+08	5.8280E+08	7.8391E+08	3.6680E+08	5.9788E+07	9.8158E+08
60000	5.1947E+07	2.0150E+07	5.2515E+08	4.1056E+07	6.3831E+08	6.2086E+08	8.3588E+08	3.7034E+08	5.8427E+07	1.0637E+09
65000	4.9628E+07	2.0084E+07	5.1939E+08	4.0892E+07	6.3000E+08	6.5738E+08	8.8604E+08	3.7345E+08	5.7176E+07	1.1439E+09
70000	4.7605E+07	2.0022E+07	5.1425E+08	4.0749E+07	6.2263E+08	6.9238E+08	9.3462E+08	3.7601E+08	5.6083E+07	1.2225E+09
75000	4.5779E+07	1.9965E+07	5.0961E+08	4.0619E+07	6.1597E+08	7.2605E+08	9.8171E+08	3.7808E+08	5.5095E+07	1.2997E+09
80000	4.4181E+07	1.9908E+07	5.0542E+08	4.0511E+07	6.1002E+08	7.5858E+08	1.0275E+09	3.7992E+08	5.4208E+07	1.3756E+09
85000	4.2691E+07	1.9863E+07	5.0165E+08	4.0404E+07	6.0461E+08	7.9010E+08	1.0720E+09	3.8151E+08	5.3407E+07	1.4503E+09
90000	4.1403E+07	1.9822E+07	4.9816E+08	4.0312E+07	5.9970E+08	8.2070E+08	1.1154E+09	3.8290E+08	5.2669E+07	1.5240E+09
95000	4.0273E+07	1.9782E+07	4.9500E+08	4.0230E+07	5.9528E+08	8.5049E+08	1.1577E+09	3.8420E+08	5.2001E+07	1.5967E+09
100000	3.9299E+07	1.9747E+07	4.9213E+08	4.0160E+07	5.9133E+08	8.7957E+08	1.1991E+09	3.8544E+08	5.1398E+07	1.6684E+09
125000	3.5546E+07	1.9605E+07	4.8122E+08	3.9845E+07	5.7622E+08	1.0163E+09	1.3951E+09	3.9036E+08	4.9062E+07	2.0166E+09
150000	3.2405E+07	1.9476E+07	4.7278E+08	3.9576E+07	5.6424E+08	1.1406E+09	1.5744E+09	3.9187E+08	4.7285E+07	2.3510E+09
175000	2.9553E+07	1.9349E+07	4.6478E+08	3.9326E+07	5.5300E+08	1.2530E+09	1.7373E+09	3.9022E+08	4.5605E+07	2.6735E+09
200000	2.7396E+07	1.9247E+07	4.5780E+08	3.9137E+07	5.4358E+08	1.3552E+09	1.8856E+09	3.8731E+08	4.4151E+07	2.9850E+09
225000	2.5592E+07	1.9155E+07	4.5192E+08	3.8975E+07	5.3565E+08	1.4496E+09	2.0216E+09	3.8355E+08	4.2927E+07	3.2872E+09
250000	2.4028E+07	1.9070E+07	4.4679E+08	3.8833E+07	5.2872E+08	1.5362E+09	2.1467E+09	3.7811E+08	4.1866E+07	3.5816E+09
275000	2.2600E+07	1.8991E+07	4.4175E+08	3.8704E+07	5.2205E+08	1.6159E+09	2.2609E+09	3.7168E+08	4.0823E+07	3.8686E+09
300000	2.1501E+07	1.8926E+07	4.3763E+08	3.8602E+07	5.1666E+08	1.6904E+09	2.3663E+09	3.6532E+08	3.9973E+07	4.1491E+09
400000	1.7711E+07	1.8677E+07	4.2300E+08	3.8243E+07	4.9763E+08	1.9430E+09	2.7085E+09	3.3763E+08	3.6908E+07	5.2168E+09
500000	1.5255E+07	1.8490E+07	4.1165E+08	3.8000E+07	4.8339E+08	2.1323E+09	2.9344E+09	3.0602E+08	3.4583E+07	6.2054E+09
600000	1.3611E+07	1.8351E+07	4.0362E+08	3.7797E+07	4.7338E+08	2.2819E+09	3.0849E+09	2.7807E+08	3.2943E+07	7.1433E+09
700000	1.2133E+07	1.8213E+07	3.9554E+08	3.7604E+07	4.6349E+08	2.3996E+09	3.1644E+09	2.4958E+08	3.1314E+07	8.0354E+09
800000	1.0824E+07	1.8161E+07	3.9175E+08	3.7473E+07	4.5821E+08	2.4875E+09	3.1938E+09	2.2677E+08	3.0528E+07	8.8926E+09

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

900000	1.0320E+07	1.8096E+07	3.8737E+08	3.7366E+07	4.5315E+08	2.5565E+09	3.1924E+09	2.0475E+08	2.9646E+07	9.7287E+09
1000000	9.9104E+06	1.8064E+07	3.8092E+08	3.6626E+07	4.4552E+08	2.6155E+09	3.1615E+09	1.8507E+08	2.8353E+07	1.0536E+10
1250000	9.6453E+06	1.7935E+07	3.7063E+08	3.5272E+07	4.3348E+08	2.7442E+09	3.0703E+09	1.6094E+08	2.6316E+07	1.2422E+10
1500000	9.4521E+06	1.7912E+07	3.6308E+08	3.4198E+07	4.2464E+08	2.8574E+09	2.9754E+09	1.5374E+08	2.4828E+07	1.4197E+10
1750000	9.2573E+06	1.7976E+07	3.5595E+08	3.3143E+07	4.1632E+08	2.9588E+09	2.8835E+09	1.5383E+08	2.3397E+07	1.5871E+10
2000000	9.0811E+06	1.7970E+07	3.4905E+08	3.2090E+07	4.0819E+08	3.0512E+09	2.7994E+09	1.5398E+08	2.2033E+07	1.7448E+10
2500000	8.9086E+06	1.7898E+07	3.3547E+08	2.9980E+07	3.9225E+08	3.2114E+09	2.6590E+09	1.4764E+08	1.9354E+07	2.0322E+10
3000000	8.7882E+06	1.7875E+07	3.2879E+08	2.8954E+07	3.8441E+08	3.3457E+09	2.5483E+09	1.3457E+08	1.8031E+07	2.2896E+10
3500000	8.5989E+06	1.7918E+07	3.2409E+08	2.8202E+07	3.7881E+08	3.4679E+09	2.4495E+09	1.2033E+08	1.7077E+07	2.5334E+10
4000000	8.5579E+06	1.7906E+07	3.1933E+08	2.7448E+07	3.7324E+08	3.5784E+09	2.3622E+09	1.0501E+08	1.6121E+07	2.7640E+10
5000000	8.3929E+06	1.7881E+07	3.0971E+08	2.5923E+07	3.6191E+08	3.7618E+09	2.2172E+09	7.8833E+07	1.4189E+07	3.1850E+10
6000000	8.1450E+06	1.7858E+07	3.0007E+08	2.4382E+07	3.5046E+08	3.8941E+09	2.1080E+09	6.2881E+07	1.2252E+07	3.5524E+10
7000000	8.1314E+06	1.7847E+07	2.9603E+08	2.3756E+07	3.4577E+08	3.9885E+09	2.0218E+09	5.8453E+07	1.1441E+07	3.8803E+10
8000000	7.9493E+06	1.7838E+07	2.9248E+08	2.3184E+07	3.4146E+08	4.0628E+09	1.9468E+09	6.1741E+07	1.0720E+07	4.1881E+10
9000050	7.9395E+06	1.7828E+07	2.8889E+08	2.2613E+07	3.3727E+08	4.1175E+09	1.8831E+09	7.1542E+07	9.9991E+06	4.4756E+10
10000050	7.8031E+06	1.7819E+07	2.8534E+08	2.2042E+07	3.3300E+08	4.1521E+09	1.8304E+09	8.9167E+07	9.2866E+06	4.7438E+10

COPATTA run I/O file: case1lca.dat/.lis

Reactor vessel energy not calculated until end of post-reflood (311 seconds for Case 1).

ECU operation begins at 60 seconds post-LOCA; containment spray flow begins at 33 seconds and reaches full flow at 60 seconds.

Sump recirculation begins at 2437 seconds.

locarslt.wb2

TABLE 9-1C: SUMMARY OF HEAT SINK RESULTS FOR CASE 1

Time (sec)	Heat Sink Surface Temperatures (F) HS #2 Liner Plate	HS #10 - Sec Shield Wall	HS #18 - CS Th <= 0.5"	HS #19 - Elec & Galv CS	Tag/Uch Cond. HTC (B/hr-ft2-F)
0	118.4	120.0	120.0	119.9	2.00
1	125.0	127.9	126.4	120.4	26.41
10	210.3	239.6	210.7	189.9	264.13
20	214.4	240.8	215.0	243.7	206.93
40	207.7	228.6	211.6	253.7	85.07
60	214.4	230.4	221.5	254.9	84.67
80	219.6	232.3	229.2	255.1	84.61
100	224.8	235.6	236.2	256.0	85.58
150	234.8	242.4	248.8	260.0	89.71
200	241.9	247.5	256.8	263.5	92.86
250	246.4	250.3	261.4	265.3	93.91
300	248.8	251.4	263.5	265.7	93.65
350	249.4	250.9	263.6	265.7	91.98
400	249.2	250.1	263.4	265.5	90.25
500	248.1	248.5	263.3	265.0	87.13
600	246.1	245.9	263.0	264.1	83.28
800	240.6	240.0	262.0	261.6	74.31
1000	235.1	234.4	260.5	258.2	65.21
1200	229.9	229.1	258.6	254.2	59.51
1300	227.5	226.7	257.5	252.1	57.15
1400	225.2	224.4	256.3	249.9	54.72
1600	220.7	219.7	253.8	245.3	49.66
1800	216.1	215.1	251.1	240.7	45.15
2000	212.1	211.1	248.3	236.1	42.18
2200	208.3	207.3	245.3	231.4	39.04
2400	204.5	203.4	242.1	226.9	36.21
2500	202.8	201.8	240.6	224.6	35.24
3000	202.2	202.9	233.5	216.0	36.96
3500	207.3	208.0	229.1	214.2	40.81
4000	210.5	211.0	226.5	216.8	42.79
6000	216.1	216.3	222.7	221.1	45.45
8000	216.2	216.3	221.8	221.3	44.93
10000	215.4	215.5	220.7	220.0	44.04
20000	208.3	208.4	212.8	211.6	38.25
30000	201.3	201.4	204.8	203.9	33.82
40000	193.8	193.9	196.9	196.0	29.00
50000	188.0	188.1	190.6	189.9	27.12
60000	182.9	183.0	184.9	184.3	25.13
70000	178.6	178.8	180.5	180.1	23.66
80000	175.2	175.3	176.8	176.5	22.71
90000	172.3	172.5	173.7	173.5	21.84
100000	170.1	170.3	171.2	171.0	21.09
200000	154.3	156.3	154.9	154.8	16.90
300000	144.4	148.3	144.5	144.5	14.99
400000	137.1	141.5	136.6	136.6	13.08
500000	131.3	135.4	130.5	130.5	11.35
600000	127.1	130.7	126.1	126.1	9.96

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

700000	123.0	126.0	121.6	121.7	9.53
800000	120.6	123.2	119.9	119.9	9.06
900000	118.2	120.4	117.6	117.6	8.68
1000000	116.6	118.4	116.2	116.2	8.30
2000000	112.7	113.6	113.4	113.4	7.77
3000000	111.4	112.4	112.3	112.3	7.63
4000000	110.8	111.7	111.6	111.7	7.51
5000000	110.1	111.0	110.9	111.0	7.43
6000000	109.5	110.3	110.2	110.2	7.29
7000000	109.1	109.9	109.8	109.9	7.28
8000000	108.8	109.6	109.6	109.6	7.17
9000050	108.6	109.3	109.2	109.3	7.17
10000050	108.3	109.0	109.0	109.0	7.09

COPATTA run I/O file: case1lca.dat/.lis

Maximum Tagami HTC = 317.0 Btu/hr-ft2-F @ 12 seconds

lcarslts.wb2

TABLE 9-2A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 2

Time (seconds)	Containment Absolute (psia)	Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.58	1.88	90.5	197.8	0.0
0.2	17.87	3.17	112.5	206.9	0.0
0.3	19.00	4.30	127.4	211.0	0.0
0.4	20.05	5.35	139.3	213.8	0.0
0.5	21.04	6.34	148.8	215.0	0.0
0.6	21.98	7.28	156.1	216.4	0.0
0.7	22.89	8.19	162.6	217.6	0.0
0.8	23.76	9.06	167.6	217.4	0.0
0.9	24.64	9.94	172.8	217.4	0.0
1	25.49	10.79	178.1	218.4	0.0
2	32.50	17.80	206.9	219.2	0.0
3	37.41	22.71	221.9	222.5	0.0
4	41.50	26.80	231.9	225.2	0.0
5	44.98	30.28	239.6	227.6	0.0
6	47.92	33.22	245.5	229.4	0.0
7	50.53	35.83	250.4	230.7	0.0
8	52.74	38.04	254.3	231.0	0.0
9	54.46	39.76	257.4	230.6	0.0
10	55.51	40.81	259.0	229.9	0.0
11	56.32	41.62	260.2	229.5	0.0
12	56.70	42.00	260.9	230.0	0.0
13	56.66	41.96	260.7	230.5	0.0
14	56.42	41.72	260.3	230.8	0.0
15	56.07	41.37	259.7	230.1	0.0
16	55.76	41.06	259.3	229.0	0.0
17	55.51	40.81	258.8	228.0	0.0
18	55.32	40.62	258.6	227.0	0.0
19	55.19	40.49	258.7	226.1	0.0
20	55.11	40.41	259.0	225.2	0.0
22	54.90	40.20	259.1	220.5	0.0
24	54.67	39.97	258.9	215.6	0.0
26	54.54	39.84	259.1	211.6	0.0
28	54.41	39.71	259.2	208.1	0.0
30	54.31	39.61	259.5	204.9	0.0
32	54.24	39.54	259.9	203.3	0.0
34	54.19	39.49	260.3	201.8	0.0
36	54.16	39.46	260.6	200.4	0.0
38	54.13	39.43	260.8	199.2	0.0
40	54.09	39.39	260.8	198.0	0.0
42	54.05	39.35	260.6	197.0	0.0
44	53.98	39.28	260.1	196.0	0.0
46	53.91	39.21	259.3	195.0	0.0
48	53.83	39.13	258.4	194.2	0.0
50	53.74	39.04	257.3	193.4	0.0
52	53.66	38.96	256.3	192.6	0.0
54	53.61	38.91	255.8	191.9	0.0
56	53.59	38.89	255.8	191.3	0.0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 177 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

58	53.57	38.87	255.7	190.7	0.0
60	53.55	38.85	255.7	190.1	0.0
62	53.51	38.81	255.7	189.6	0.0
64	53.48	38.78	255.5	189.1	0.0
66	53.45	38.75	255.5	188.7	0.0
68	53.42	38.72	255.4	188.2	0.0
70	53.39	38.69	255.4	187.8	0.0
72	53.37	38.67	255.3	187.4	0.0
74	53.34	38.64	255.3	186.8	0.0
76	53.33	38.63	255.3	185.9	0.0
78	53.33	38.63	255.3	184.9	0.0
80	53.47	38.77	255.6	184.8	0.0
82	53.60	38.90	255.7	184.8	0.0
84	53.74	39.04	256.0	184.8	0.0
86	53.88	39.18	256.2	184.7	0.0
88	54.01	39.31	256.4	184.7	0.0
90	54.11	39.41	256.7	184.7	0.0
92	54.34	39.64	256.9	184.7	0.0
94	54.56	39.86	257.1	184.7	0.0
96	54.78	40.08	257.3	184.7	0.0
98	55.00	40.30	257.5	184.6	0.0
100	55.23	40.53	257.8	184.6	0.0
105	55.57	40.87	258.3	184.6	0.0
110	55.91	41.21	258.9	184.5	0.0
115	56.26	41.56	259.5	184.5	0.0
120	56.58	41.88	259.9	184.5	0.0
125	56.92	42.22	260.5	184.4	0.0
130	57.25	42.55	261.0	184.4	0.0
135	57.58	42.88	261.4	184.3	0.0
140	57.90	43.20	262.0	184.2	0.0
145	58.23	43.53	262.5	184.2	0.0
150	58.50	43.80	262.9	184.2	0.0
155	58.81	44.11	263.3	184.2	0.0
160	59.08	44.38	263.7	184.2	0.0
165	59.31	44.61	264.0	184.2	0.0
170	59.52	44.82	264.4	184.3	0.0
175	59.66	44.96	264.5	184.5	0.0
180	59.83	45.13	264.8	184.7	0.0
185	59.96	45.26	265.0	185.0	0.0
190	60.08	45.38	265.2	185.3	0.0
195	60.17	45.47	265.3	185.7	0.0
200	60.25	45.55	265.4	186.1	0.0
205	60.33	45.63	265.5	186.6	0.0
210	60.38	45.68	265.6	187.1	0.0
215	60.38	45.68	265.6	187.7	0.0
220	60.38	45.68	265.6	188.3	0.0
225	60.34	45.64	265.5	188.9	0.0
230	60.29	45.59	265.4	189.5	0.0
235	60.23	45.53	265.4	190.1	0.0
240	60.15	45.45	265.2	190.8	0.0
245	60.06	45.36	265.1	191.3	0.0
250	59.96	45.26	264.9	191.9	0.0
255	59.85	45.15	264.8	192.0	0.0
260	59.68	44.98	264.6	193.1	292.1

265	59.47	44.77	264.2	193.7	291.4
270	59.23	44.53	263.8	194.2	290.6
275	59.00	44.30	263.4	194.8	289.8
280	58.79	44.09	263.3	195.3	289.1
285	58.60	43.90	262.9	195.8	288.3
290	58.38	43.68	262.5	196.3	287.6
295	58.18	43.48	262.3	196.7	286.9
300	57.96	43.26	262.0	197.2	286.1
310	57.55	42.85	261.3	198.1	284.7
320	57.14	42.44	260.6	198.9	283.4
330	56.75	42.05	260.0	199.6	282.0
340	56.38	41.68	259.4	200.4	280.7
350	56.01	41.31	258.8	201.0	279.5
360	55.65	40.95	258.2	201.7	278.2
370	55.31	40.61	257.6	202.3	277.0
380	54.97	40.27	257.1	202.8	275.8
390	54.64	39.94	256.5	203.4	274.6
400	54.31	39.61	256.0	203.9	273.5
420	53.68	38.98	254.9	204.8	271.3
440	53.18	38.48	254.0	205.6	269.3
460	52.60	37.90	253.0	206.3	267.4
480	52.04	37.34	252.0	206.9	265.7
500	51.51	36.81	251.0	207.4	261.9
520	50.98	36.28	250.1	207.8	252.2
540	50.47	35.77	249.2	208.0	243.5
560	49.98	35.28	248.2	208.0	235.9
580	49.50	34.80	247.3	208.0	229.0
600	49.04	34.34	246.4	207.8	223.0
650	48.01	33.31	244.4	207.1	210.6
700	46.96	32.26	242.3	206.1	201.2
750	45.96	31.26	240.2	204.9	193.8
800	45.02	30.32	238.2	203.6	188.0
850	44.13	29.43	236.3	202.2	183.3
900	43.29	28.59	234.4	200.8	179.4
950	42.55	27.85	232.7	199.5	176.1
1000	41.78	27.08	230.8	198.1	173.2
1050	41.04	26.34	229.0	196.8	170.8
1100	40.33	25.63	227.2	195.5	168.9
1150	39.66	24.96	225.5	194.2	167.3
1200	39.02	24.32	223.8	193.0	166.0
1220	38.77	24.07	223.1	192.5	165.6
1240	38.52	23.82	222.5	192.0	165.1
1260	38.28	23.58	221.8	191.6	164.7
1280	38.05	23.35	221.2	191.1	164.3
1300	37.81	23.11	220.5	190.7	163.9
1320	37.65	22.95	220.0	190.3	163.6
1340	37.43	22.73	219.4	189.8	163.2
1360	37.20	22.50	218.7	189.4	162.9
1380	36.98	22.28	218.1	189.0	162.6
1400	36.77	22.07	217.5	188.9	168.4
1450	36.24	21.54	216.0	188.9	187.5
1500	35.73	21.03	214.4	189.0	205.5
1550	35.24	20.54	213.0	189.1	222.6
1600	34.77	20.07	211.5	189.3	238.8

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇓

1650	34.32	19.62	210.1	189.5	254.0
1700	34.34	19.64	210.2	189.7	258.1
1750	34.51	19.81	210.7	189.9	258.4
1800	34.66	19.96	211.2	190.0	258.7
1850	34.79	20.09	211.6	190.2	258.9
1900	34.89	20.19	211.9	190.4	259.1
1950	34.98	20.28	212.2	190.6	259.2
2000	35.06	20.36	212.4	190.7	259.4
2050	35.13	20.43	212.6	190.9	259.5
2100	35.19	20.49	212.8	191.1	259.6
2150	35.24	20.54	213.0	191.3	259.7
2200	35.28	20.58	213.1	191.5	259.7
2250	35.32	20.62	213.2	191.6	259.8
2300	35.35	20.65	213.3	191.8	259.8
2350	35.37	20.67	213.4	192.0	259.9
2400	35.39	20.69	213.4	192.2	259.9
2420	35.40	20.70	213.5	192.2	259.9
2440	35.40	20.70	213.4	192.3	259.9
2460	35.40	20.70	213.5	192.4	259.9
2480	35.41	20.71	213.5	192.5	259.9
2500	35.41	20.71	213.5	192.5	259.9
2600	35.41	20.71	213.5	192.9	259.9
2700	35.40	20.70	213.4	193.2	259.9
2800	35.37	20.67	213.4	193.6	259.9
2900	35.33	20.63	213.2	193.9	259.8
3000	35.29	20.59	213.1	194.3	259.8
3100	35.23	20.53	212.9	194.6	259.7
3200	35.18	20.48	212.8	194.9	259.6
3300	35.11	20.41	212.6	195.2	259.5
3400	35.04	20.34	212.3	195.5	259.4
3500	34.97	20.27	212.1	195.9	259.2
3600	34.89	20.19	211.9	196.2	259.1
3700	34.81	20.11	211.6	196.5	259.0
3800	34.73	20.03	211.4	196.7	258.8
3900	34.65	19.95	211.1	197.0	258.7
4000	34.57	19.87	210.9	197.3	258.5
4500	34.20	19.50	209.7	198.6	257.9
5000	33.83	19.13	208.5	199.7	257.2
5500	33.48	18.78	207.3	200.8	256.6
6000	33.11	18.41	206.1	201.7	256.0
6500	32.73	18.03	204.8	202.5	255.3
7000	32.37	17.67	203.5	203.1	254.6
7500	31.89	17.19	201.8	203.9	253.8
8000	31.50	16.80	200.4	204.5	253.1
8500	31.21	16.51	199.2	205.1	252.5
9000	30.95	16.25	198.3	205.6	252.1
9500	30.74	16.04	197.5	206.0	251.7
10000	30.53	15.83	196.6	206.4	251.3
12500	29.68	14.98	193.2	207.3	249.7
15000	29.00	14.30	190.3	207.4	248.3
17500	28.34	13.64	187.4	206.9	247.0
20000	27.74	13.04	184.6	206.0	245.7
22500	27.27	12.57	182.4	204.9	244.7
25000	26.86	12.16	180.4	203.8	243.9

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

27500	26.47	11.77	178.4	202.7	243.1
30000	26.10	11.40	176.4	201.5	242.3
35000	25.33	10.63	172.1	199.2	240.8
40000	24.72	10.02	168.5	197.0	239.4
45000	24.25	9.55	165.5	195.0	238.3
50000	23.81	9.11	162.7	193.2	237.2
55000	23.43	8.73	160.1	191.5	236.3
60000	23.13	8.43	157.9	190.1	235.5
65000	22.85	8.15	155.9	188.8	234.9
70000	22.59	7.89	153.9	187.6	234.2
75000	22.35	7.65	152.1	186.5	233.7
80000	22.17	7.47	150.7	185.6	233.2
85000	22.00	7.30	149.3	184.8	232.8
90000	21.85	7.15	148.0	184.0	232.5
95000	21.73	7.03	147.0	183.4	232.2
100000	21.62	6.92	146.0	182.8	231.9
125000	21.15	6.45	141.8	180.5	230.8
150000	20.76	6.06	138.0	178.6	229.8
175000	20.38	5.68	134.2	176.8	228.9
200000	20.11	5.41	131.3	175.4	228.2
225000	19.88	5.18	128.7	174.2	227.6
250000	19.65	4.95	127.0	173.2	226.7
275000	19.50	4.80	125.1	172.0	226.3
300000	19.30	4.60	121.7	170.9	226.0
400000	18.93	4.23	117.0	165.9	218.4
500000	18.83	4.13	115.5	159.8	207.7
600000	18.76	4.06	114.6	155.7	200.2
700000	18.71	4.01	114.8	152.0	193.2
800000	18.64	3.94	112.9	149.8	189.3
900000	18.68	3.98	115.1	147.9	185.7
1000000	18.58	3.88	112.0	146.0	182.1
1250000	18.61	3.91	114.0	143.4	177.3
1500000	18.57	3.87	113.6	141.4	173.5
1750000	18.54	3.84	113.2	139.5	169.7
2000000	18.52	3.82	112.9	137.5	166.0
2500000	18.46	3.76	111.9	133.5	158.3
3000000	18.35	3.65	108.7	131.6	154.7
3500000	18.34	3.64	108.4	130.3	152.0
4000000	18.40	3.70	111.1	128.9	149.4
5000000	18.36	3.66	110.6	126.2	144.1
6000000	18.29	3.59	108.5	123.4	138.8
7000000	18.30	3.60	109.8	122.2	136.6
8000000	18.30	3.60	109.5	121.2	134.6
9000050	18.27	3.57	109.2	120.2	132.7
10000050	18.25	3.55	109.0	119.1	130.7

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (258 seconds for Case 2)

COPATTA run I/O file: case2lca.dat/.lis

lcarslts.wb2

TABLE 9-3A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 3

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.58	1.88	90.5	197.8	0.0
0.2	17.87	3.17	112.5	206.9	0.0
0.3	19.00	4.30	127.4	211.0	0.0
0.4	20.05	5.35	139.3	213.8	0.0
0.5	21.04	6.34	148.8	215.0	0.0
0.6	21.98	7.28	156.1	216.4	0.0
0.7	22.89	8.19	162.6	217.6	0.0
0.8	23.76	9.06	167.6	217.4	0.0
0.9	24.64	9.94	172.8	217.4	0.0
1	25.49	10.79	178.1	218.4	0.0
2	32.50	17.80	206.9	219.2	0.0
3	37.41	22.71	221.9	222.5	0.0
4	41.50	26.80	231.9	225.2	0.0
5	44.98	30.28	239.6	227.6	0.0
6	47.92	33.22	245.5	229.4	0.0
7	50.53	35.83	250.4	230.7	0.0
8	52.74	38.04	254.3	231.0	0.0
9	54.46	39.76	257.4	230.6	0.0
10	55.51	40.81	259.0	229.9	0.0
11	56.32	41.62	260.2	229.5	0.0
12	56.70	42.00	260.9	230.0	0.0
13	56.66	41.96	260.7	230.5	0.0
14	56.42	41.72	260.3	230.8	0.0
15	56.07	41.37	259.7	230.1	0.0
16	55.76	41.06	259.3	229.0	0.0
17	55.51	40.81	258.8	228.0	0.0
18	55.32	40.62	258.6	227.0	0.0
19	55.19	40.49	258.7	226.1	0.0
20	55.11	40.41	259.0	225.2	0.0
22	54.90	40.20	259.1	220.5	0.0
24	54.67	39.97	258.9	215.6	0.0
26	54.54	39.84	259.1	211.6	0.0
28	54.41	39.71	259.2	208.1	0.0
30	54.31	39.61	259.5	204.9	0.0
32	54.24	39.54	259.9	203.3	0.0
34	54.19	39.49	260.3	201.8	0.0
36	54.14	39.44	260.3	200.4	0.0
38	54.08	39.38	260.0	199.2	0.0
40	54.01	39.31	259.5	198.0	0.0
42	53.91	39.21	258.5	196.9	0.0
44	53.79	39.09	256.9	196.0	0.0
46	53.69	38.99	255.9	195.0	0.0
48	53.66	38.96	255.9	194.2	0.0
50	53.63	38.93	255.8	193.4	0.0
52	53.61	38.91	255.8	192.7	0.0
54	53.57	38.87	255.7	192.0	0.0
56	53.55	38.85	255.7	191.4	0.0

58	53.51	38.81	255.5	190.8	0.0
60	53.43	38.73	255.3	190.3	0.0
62	53.43	38.73	255.3	189.8	0.0
64	53.35	38.65	255.2	189.4	0.0
66	53.31	38.61	255.1	189.0	0.0
68	53.28	38.58	255.1	188.6	0.0
70	53.25	38.55	255.0	188.2	0.0
72	53.22	38.52	255.0	187.8	0.0
74	53.19	38.49	254.9	187.2	0.0
76	53.16	38.46	254.9	186.4	0.0
78	53.21	38.51	255.0	185.5	0.0
80	53.35	38.65	255.3	185.4	0.0
82	53.48	38.78	255.6	185.4	0.0
84	53.61	38.91	255.6	185.4	0.0
86	53.74	39.04	256.0	185.4	0.0
88	53.87	39.17	256.1	185.5	0.0
90	54.00	39.30	256.3	185.5	0.0
92	54.18	39.48	256.5	185.5	0.0
94	54.41	39.71	256.8	185.5	0.0
96	54.62	39.92	257.1	185.6	0.0
98	54.84	40.14	257.3	185.6	0.0
100	55.05	40.35	257.4	185.6	0.0
105	55.38	40.68	257.9	185.6	0.0
110	55.71	41.01	258.5	185.7	0.0
115	56.04	41.34	259.1	185.7	0.0
120	56.36	41.66	259.5	185.8	0.0
125	56.68	41.98	260.0	185.8	0.0
130	56.99	42.29	260.5	185.9	0.0
135	57.30	42.60	260.9	185.9	0.0
140	57.62	42.92	261.5	185.9	0.0
145	57.94	43.24	262.0	186.0	0.0
150	58.23	43.53	262.4	186.0	0.0
155	58.53	43.83	262.8	186.1	0.0
160	58.75	44.05	263.2	186.2	0.0
165	58.97	44.27	263.5	186.4	0.0
170	59.16	44.46	263.8	186.6	0.0
175	59.33	44.63	264.0	186.8	0.0
180	59.47	44.77	264.3	187.1	0.0
185	59.60	44.90	264.5	187.4	0.0
190	59.66	44.96	264.5	187.8	0.0
195	59.74	45.04	264.7	188.2	0.0
200	59.81	45.11	264.8	188.7	0.0
205	59.87	45.17	264.8	189.2	0.0
210	59.90	45.20	264.9	189.8	0.0
215	59.89	45.19	264.8	190.5	0.0
220	59.87	45.17	264.8	191.1	0.0
225	59.82	45.12	264.7	191.7	0.0
230	59.76	45.06	264.7	192.4	0.0
235	59.69	44.99	264.5	193.0	0.0
240	59.59	44.89	264.4	193.6	0.0
245	59.49	44.79	264.2	194.3	0.0
250	59.38	44.68	264.1	194.9	0.0
255	59.25	44.55	263.9	195.0	0.0
260	59.07	44.37	263.6	196.0	291.5

265	58.92	44.22	263.5	196.6	290.7
270	58.66	43.96	263.0	197.2	290.0
275	58.41	43.71	262.6	197.7	289.2
280	58.17	43.47	262.2	198.3	288.5
285	57.93	43.23	261.9	198.8	287.8
290	57.70	43.00	261.5	199.3	287.1
295	57.46	42.76	261.1	199.7	286.4
300	57.24	42.54	260.7	200.2	285.7
310	56.80	42.10	260.0	201.1	284.4
320	56.37	41.67	259.4	201.9	283.1
330	55.97	41.27	258.7	202.6	281.8
340	55.57	40.87	258.0	203.4	280.5
350	55.18	40.48	257.4	204.0	279.3
360	54.80	40.10	256.8	204.7	278.1
370	54.42	39.72	256.1	205.3	276.9
380	54.06	39.36	255.5	205.8	275.8
390	53.71	39.01	254.9	206.3	274.6
400	53.46	38.76	254.5	206.8	273.5
420	52.79	38.09	253.3	207.7	271.4
440	52.15	37.45	252.2	208.5	269.4
460	51.53	36.83	251.1	209.1	267.6
480	50.94	36.24	250.0	209.7	265.9
500	50.38	35.68	249.0	210.2	262.2
520	49.82	35.12	247.9	210.5	252.5
540	49.28	34.58	246.9	210.7	243.9
560	48.76	34.06	245.9	210.7	236.2
580	48.35	33.65	245.1	210.7	229.4
600	47.85	33.15	244.1	210.5	223.4
650	46.67	31.97	241.7	209.7	211.0
700	45.56	30.86	239.4	208.7	201.6
750	44.52	29.82	237.1	207.5	194.2
800	43.53	28.83	234.9	206.2	188.4
850	42.67	27.97	232.9	204.8	183.7
900	41.78	27.08	230.8	203.5	179.7
950	40.93	26.23	228.7	202.1	176.4
1000	40.13	25.43	226.7	200.7	173.5
1050	39.36	24.66	224.7	199.4	171.1
1100	38.64	23.94	222.8	198.1	169.1
1150	37.94	23.24	220.9	196.8	167.5
1200	37.34	22.64	219.2	195.6	166.2
1220	37.08	22.38	218.4	195.2	165.7
1240	36.82	22.12	217.7	194.7	165.2
1260	36.60	21.90	217.0	194.7	173.4
1280	36.38	21.68	216.4	194.7	181.4
1300	36.17	21.47	215.7	194.7	189.2
1320	35.95	21.25	215.1	194.7	196.8
1340	35.74	21.04	214.5	194.7	204.3
1360	35.54	20.84	213.9	194.7	211.6
1380	35.33	20.63	213.3	194.8	218.8
1400	35.13	20.43	212.6	194.8	225.8
1450	34.65	19.95	211.1	194.9	242.7
1500	34.23	19.53	209.8	195.1	257.9
1550	34.43	19.73	210.4	195.2	258.2
1600	34.61	19.91	211.0	195.3	258.6

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

1650	34.77	20.07	211.5	195.5	258.9
1700	34.90	20.20	211.9	195.6	259.1
1750	35.02	20.32	212.3	195.7	259.3
1800	35.12	20.42	212.6	195.9	259.5
1850	35.21	20.51	212.9	196.0	259.6
1900	35.28	20.58	213.1	196.1	259.7
1950	35.35	20.65	213.3	196.3	259.8
2000	35.41	20.71	213.5	196.4	259.9
2050	35.46	20.76	213.6	196.5	260.0
2100	35.51	20.81	213.8	196.7	260.1
2150	35.54	20.84	213.9	196.8	260.1
2200	35.57	20.87	214.0	196.9	260.2
2250	35.61	20.91	214.1	197.1	260.2
2300	35.62	20.92	214.1	197.2	260.3
2350	35.63	20.93	214.2	197.4	260.3
2400	35.64	20.94	214.2	197.5	260.3
2420	35.64	20.94	214.2	197.5	260.3
2440	35.64	20.94	214.2	197.6	260.3
2460	35.64	20.94	214.2	197.7	260.3
2480	35.64	20.94	214.2	197.7	260.3
2500	35.64	20.94	214.2	197.8	260.3
2600	35.63	20.93	214.2	198.0	260.3
2700	35.61	20.91	214.1	198.3	260.3
2800	35.57	20.87	214.0	198.5	260.2
2900	35.52	20.82	213.8	198.8	260.1
3000	35.46	20.76	213.6	199.0	260.0
3100	35.40	20.70	213.5	199.3	259.9
3200	35.33	20.63	213.2	199.5	259.8
3300	35.26	20.56	213.0	199.7	259.7
3400	35.18	20.48	212.8	200.0	259.6
3500	35.09	20.39	212.5	200.2	259.5
3600	35.00	20.30	212.2	200.4	259.3
3700	34.91	20.21	212.0	200.6	259.2
3800	34.83	20.13	211.7	200.7	259.0
3900	34.74	20.04	211.4	200.9	258.8
4000	34.65	19.95	211.1	201.1	258.7
4500	34.23	19.53	209.8	201.9	258.0
5000	33.82	19.12	208.4	202.5	257.2
5500	33.42	18.72	207.1	202.9	256.5
6000	33.02	18.32	205.8	203.2	255.8
6500	32.61	17.91	204.4	203.4	255.0
7000	32.19	17.49	202.9	203.5	254.3
7500	31.70	17.00	201.1	203.6	253.4
8000	31.27	16.57	199.5	203.7	252.6
8500	30.93	16.23	198.2	203.7	252.0
9000	30.65	15.95	197.1	203.5	251.5
9500	30.37	15.67	196.0	203.4	251.0
10000	30.13	15.43	195.0	203.1	250.6
12500	29.07	14.37	190.6	201.5	248.5
15000	28.14	13.44	186.5	199.3	246.6
17500	27.25	12.55	182.3	197.0	244.7
20000	26.61	11.91	179.1	194.5	243.4
22500	26.10	11.40	176.4	192.3	242.3
25000	25.60	10.90	173.7	190.3	241.3

27500	25.13	10.43	170.9	188.4	240.4
30000	24.71	10.01	168.4	186.7	239.4
35000	23.84	9.14	162.9	183.2	237.3
40000	23.12	8.42	157.9	179.8	235.5
45000	22.58	7.88	153.9	176.9	234.2
50000	22.11	7.41	150.2	174.4	233.1
55000	21.72	7.02	146.8	172.2	232.1
60000	21.41	6.71	144.2	170.3	231.4
65000	21.16	6.46	141.8	168.7	230.8
70000	20.93	6.23	139.7	167.3	230.2
75000	20.73	6.03	137.7	166.1	229.7
80000	20.56	5.86	136.1	165.0	229.3
85000	20.41	5.71	134.5	164.0	229.0
90000	20.28	5.58	133.2	163.2	228.6
95000	20.18	5.48	132.0	162.4	228.4
100000	20.08	5.38	131.0	161.8	228.2
125000	19.69	4.99	126.6	159.2	227.0
150000	19.35	4.65	122.4	156.9	226.0
175000	19.00	4.30	119.2	154.9	224.8
200000	18.86	4.16	116.9	153.0	222.1
225000	18.84	4.14	117.3	150.8	217.1
250000	18.75	4.05	115.4	148.8	212.3
275000	18.73	4.03	115.8	147.0	208.3
300000	18.64	3.94	112.9	145.7	205.2
400000	18.62	3.92	114.3	140.8	193.4
500000	18.54	3.84	113.1	137.5	185.5
600000	18.42	3.72	109.8	135.2	179.8
700000	18.46	3.76	111.8	132.9	174.2
800000	18.42	3.72	111.5	131.7	171.2
900000	18.40	3.70	111.2	130.5	168.4
1000000	18.39	3.69	110.9	129.4	165.5
1250000	18.36	3.66	110.5	127.8	161.8
1500000	18.34	3.64	110.2	126.6	158.7
1750000	18.31	3.61	109.9	125.4	155.7
2000000	18.30	3.60	109.6	124.2	152.7
2500000	18.26	3.56	109.0	121.8	146.6
3000000	18.24	3.54	108.8	120.6	143.7
3500000	18.23	3.53	108.5	119.8	141.6
4000000	18.23	3.53	108.3	118.9	139.4
5000000	18.21	3.51	107.9	117.2	135.1
6000000	18.20	3.50	107.5	115.4	130.8
7000000	18.19	3.49	107.3	114.7	129.1
8000000	18.19	3.49	107.1	114.1	127.5
9000050	18.19	3.49	107.0	113.4	126.0
10000050	18.18	3.48	106.8	112.8	124.4

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (258 seconds for Case 3)

COPATTA run I/O file: case3lca.dat/.lis

lcarslts.wb2

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

TABLE 9-4A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 4

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.55	1.85	89.9	206.4	0.0
0.2	17.39	2.69	105.0	210.9	0.0
0.3	18.17	3.47	116.7	213.9	0.0
0.4	18.91	4.21	126.3	216.4	0.0
0.5	19.65	4.95	135.3	218.3	0.0
0.6	20.34	5.64	142.6	219.9	0.0
0.7	21.00	6.30	148.1	220.0	0.0
0.8	21.66	6.96	153.7	220.3	0.0
0.9	22.30	7.60	158.1	220.9	0.0
1	22.93	8.23	162.1	220.6	0.0
2	28.80	14.10	193.0	222.4	0.0
3	33.51	18.81	210.2	225.3	0.0
4	36.98	22.28	220.5	228.0	0.0
5	39.84	25.14	228.0	231.1	0.0
6	42.45	27.75	234.1	234.1	0.0
7	44.76	30.06	239.2	236.6	0.0
8	46.91	32.21	243.5	238.9	0.0
9	48.78	34.08	247.2	241.0	0.0
10	50.58	35.88	250.5	242.5	0.0
11	52.18	37.48	253.3	243.5	0.0
12	53.42	38.72	255.4	244.4	0.0
13	54.35	39.65	257.0	245.1	0.0
14	54.91	40.21	258.0	245.9	0.0
15	55.27	40.57	258.6	246.6	0.0
16	55.43	40.73	258.7	247.1	0.0
17	55.43	40.73	258.9	247.5	0.0
18	55.32	40.62	258.6	247.8	0.0
19	55.08	40.38	258.2	247.9	0.0
20	54.83	40.13	257.8	248.0	0.0
22	54.56	39.86	257.8	248.0	0.0
24	54.46	39.76	258.6	242.7	0.0
26	54.33	39.63	258.8	236.7	0.0
28	54.20	39.50	259.1	231.7	0.0
30	54.12	39.42	259.5	227.5	0.0
32	54.07	39.37	260.0	223.9	0.0
34	54.05	39.35	260.5	220.8	0.0
36	54.04	39.34	261.0	218.1	0.0
38	54.04	39.34	261.3	215.7	0.0
40	54.05	39.35	261.4	213.6	0.0
42	54.04	39.34	261.4	211.7	0.0
44	54.01	39.31	261.0	210.0	0.0
46	53.97	39.27	260.3	208.4	0.0
48	53.92	39.22	259.5	207.1	0.0
50	53.87	39.17	258.6	205.8	0.0
52	53.82	39.12	257.7	204.7	0.0
54	53.77	39.07	256.6	203.6	0.0
56	53.74	39.04	256.1	202.6	0.0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 187 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

58	53.75	39.05	256.1	201.8	0.0
60	53.76	39.06	256.1	201.0	0.0
62	53.77	39.07	256.1	200.3	0.0
64	53.76	39.06	256.0	199.7	0.0
66	53.77	39.07	256.1	199.1	0.0
68	53.77	39.07	256.0	198.5	0.0
70	53.78	39.08	256.1	198.0	0.0
72	53.79	39.09	256.1	197.6	0.0
74	53.80	39.10	256.1	197.2	0.0
76	53.82	39.12	256.2	196.8	0.0
78	53.83	39.13	256.1	196.5	0.0
80	53.85	39.15	256.2	196.1	0.0
82	53.86	39.16	256.2	195.9	0.0
84	53.87	39.17	256.2	195.6	0.0
86	53.87	39.17	256.0	195.4	0.0
88	53.88	39.18	256.0	195.3	0.0
90	53.88	39.18	256.0	195.2	0.0
92	54.07	39.37	256.4	195.2	0.0
94	54.27	39.57	256.6	195.4	0.0
96	54.51	39.81	257.0	195.6	0.0
98	54.73	40.03	257.1	195.7	0.0
100	54.95	40.25	257.3	195.9	0.0
105	55.24	40.54	257.8	196.2	0.0
110	55.48	40.78	258.2	196.6	0.0
115	55.68	40.98	258.5	197.0	0.0
120	55.84	41.14	258.8	197.4	0.0
125	55.96	41.26	258.9	197.7	0.0
130	56.06	41.36	259.0	198.1	0.0
135	56.13	41.43	259.1	198.5	0.0
140	56.18	41.48	259.2	198.9	0.0
145	56.21	41.51	259.2	199.3	0.0
150	56.23	41.53	259.2	199.7	0.0
155	56.23	41.53	259.2	200.1	0.0
160	56.21	41.51	259.2	200.4	0.0
165	56.19	41.49	259.2	200.8	0.0
170	56.16	41.46	259.1	201.2	0.0
175	56.12	41.42	259.1	201.6	0.0
180	56.06	41.36	259.0	202.0	0.0
185	56.01	41.31	258.9	202.5	0.0
190	55.95	41.25	258.8	202.9	0.0
195	55.90	41.20	258.7	203.4	0.0
200	55.85	41.15	258.6	204.0	0.0
205	55.79	41.09	258.5	204.5	0.0
210	55.73	41.03	258.4	205.0	0.0
215	55.67	40.97	258.3	205.5	0.0
220	55.61	40.91	258.2	206.0	0.0
225	55.55	40.85	258.1	206.5	0.0
230	55.48	40.78	258.0	207.0	0.0
235	55.42	40.72	257.9	207.5	0.0
240	55.35	40.65	257.8	208.0	0.0
245	55.29	40.59	257.7	208.5	0.0
250	55.22	40.52	257.6	209.0	0.0
255	55.15	40.45	257.5	210.3	287.1
260	55.02	40.32	257.3	211.0	286.9

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 188 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇓

265	54.89	40.19	257.0	211.4	286.7
270	54.77	40.07	256.8	211.9	286.6
275	54.65	39.95	256.6	212.3	286.5
280	54.53	39.83	256.4	212.8	286.3
285	54.42	39.72	256.3	213.2	286.2
290	54.30	39.60	256.1	213.6	286.1
295	54.23	39.53	255.9	214.0	285.9
300	54.12	39.42	255.7	214.5	285.8
310	53.92	39.22	255.4	215.3	285.6
320	53.68	38.98	255.0	216.0	285.3
330	53.57	38.87	255.1	216.8	285.2
340	53.39	38.69	254.5	217.5	285.0
350	53.17	38.47	254.2	218.2	284.7
360	52.99	38.29	253.9	218.9	284.5
370	52.85	38.15	253.6	219.5	284.4
380	52.67	37.97	253.2	220.2	284.1
390	52.50	37.80	252.9	220.8	283.9
400	52.33	37.63	252.7	221.4	283.7
420	52.02	37.32	252.1	222.6	283.4
440	51.71	37.01	251.5	223.7	283.0
460	51.42	36.72	251.0	224.7	282.7
480	51.13	36.43	250.5	225.7	282.4
500	50.75	36.05	249.8	226.6	280.0
520	50.29	35.59	249.0	227.4	275.0
540	49.86	35.16	248.1	228.1	270.4
560	49.44	34.74	247.4	228.7	266.0
580	49.03	34.33	246.6	229.3	262.0
600	48.63	33.93	245.8	229.7	258.1
650	47.78	33.08	244.1	230.5	249.7
700	46.89	32.19	242.3	230.9	242.3
750	46.05	31.35	240.6	231.1	235.9
800	45.26	30.56	239.0	231.1	230.2
850	44.51	29.81	237.3	230.9	225.1
900	43.79	29.09	235.8	230.5	220.5
950	43.11	28.41	234.2	230.1	216.3
1000	42.54	27.84	232.9	229.6	212.4
1050	41.91	27.21	231.4	229.0	209.0
1100	41.31	26.61	230.0	228.3	206.0
1150	40.73	26.03	228.5	227.6	203.4
1200	40.18	25.48	227.2	226.9	201.2
1220	39.96	25.26	226.6	226.6	200.4
1240	39.75	25.05	226.1	226.3	199.6
1260	39.54	24.84	225.5	226.0	198.8
1280	39.34	24.64	225.0	225.7	198.1
1300	39.14	24.44	224.5	225.5	197.5
1320	38.94	24.24	224.0	225.2	196.8
1340	38.75	24.05	223.4	224.9	196.2
1360	38.56	23.86	222.9	224.6	195.6
1380	38.37	23.67	222.4	224.3	195.0
1400	38.18	23.48	221.9	224.0	194.4
1450	37.73	23.03	220.7	223.2	193.1
1500	37.35	22.65	219.6	222.5	191.9
1550	36.92	22.22	218.4	221.8	190.8
1600	36.51	21.81	217.2	221.1	189.7

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 189 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

1650	36.11	21.41	216.0	220.4	188.7
1700	35.72	21.02	214.8	219.7	187.7
1750	35.34	20.64	213.6	219.0	186.7
1800	34.98	20.28	212.5	218.3	185.8
1850	34.62	19.92	211.4	217.6	184.9
1900	34.28	19.58	210.3	217.0	184.1
1950	33.95	19.25	209.2	216.3	183.3
2000	33.64	18.94	208.1	215.7	182.6
2050	33.36	18.66	207.2	215.1	181.9
2100	33.06	18.36	206.1	214.4	181.2
2150	32.76	18.06	205.1	213.8	180.5
2200	32.48	17.78	204.1	213.2	179.9
2250	32.20	17.50	203.0	212.6	179.3
2300	31.93	17.23	202.0	212.0	178.6
2350	31.67	16.97	201.1	211.5	178.0
2400	31.41	16.71	200.1	210.9	177.4
2420	31.31	16.61	199.7	210.7	177.2
2440	31.22	16.52	199.3	210.5	178.7
2460	31.14	16.44	199.0	210.4	185.2
2480	31.05	16.35	198.7	210.3	191.6
2500	30.97	16.27	198.4	210.3	198.0
2600	30.59	15.89	196.9	210.1	228.2
2700	30.46	15.76	196.5	210.0	251.0
2800	31.14	16.44	199.0	209.9	252.3
2900	31.74	17.04	201.3	209.7	253.4
3000	32.26	17.56	203.2	209.7	254.3
3100	32.72	18.02	204.8	209.6	255.1
3200	33.13	18.43	206.2	209.5	255.9
3300	33.49	18.79	207.4	209.5	256.5
3400	33.78	19.08	208.4	209.5	257.1
3500	34.07	19.37	209.3	209.4	257.6
3600	34.32	19.62	210.1	209.4	258.0
3700	34.55	19.85	210.8	209.4	258.5
3800	34.77	20.07	211.5	209.4	258.8
3900	34.96	20.26	212.1	209.4	259.2
4000	35.15	20.45	212.7	209.4	259.5
4500	35.91	21.21	215.0	209.6	260.7
5000	36.44	21.74	216.6	209.8	261.6
5500	36.78	22.08	217.6	210.2	262.1
6000	36.99	22.29	218.1	210.5	262.5
6500	37.08	22.38	218.4	210.9	262.6
7000	37.08	22.38	218.4	211.2	262.6
7500	37.02	22.32	218.2	211.6	262.5
8000	36.96	22.26	218.1	211.9	262.4
8500	36.91	22.21	217.9	212.2	262.3
9000	36.86	22.16	217.8	212.4	262.2
9500	36.80	22.10	217.6	212.7	262.2
10000	36.73	22.03	217.4	212.9	262.0
12500	36.30	21.60	216.2	213.8	261.4
15000	35.73	21.03	214.5	214.1	260.5
17500	35.00	20.30	212.2	214.0	259.3
20000	34.30	19.60	210.0	213.6	258.1
22500	33.74	19.04	208.2	212.8	257.0
25000	33.22	18.52	206.5	211.9	256.1

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 190 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

27500	32.67	17.97	204.6	210.9	255.1
30000	32.13	17.43	202.7	209.8	254.2
35000	31.04	16.34	198.6	207.4	252.2
40000	30.07	15.37	194.9	204.8	250.5
45000	29.32	14.62	191.7	202.3	248.9
50000	28.61	13.91	188.7	200.0	247.5
55000	27.94	13.24	185.6	197.7	246.1
60000	27.39	12.69	183.0	195.7	245.0
65000	26.94	12.24	180.8	193.8	244.1
70000	26.53	11.83	178.7	192.1	243.2
75000	26.15	11.45	176.7	190.6	242.4
80000	25.83	11.13	175.0	189.3	241.8
85000	25.54	10.84	173.3	188.0	241.2
90000	25.27	10.57	171.8	186.9	240.6
95000	25.05	10.35	170.5	185.9	240.2
100000	24.85	10.15	169.3	184.9	239.7
125000	24.10	9.40	164.7	181.5	237.9
150000	23.46	8.76	160.4	178.7	236.4
175000	22.87	8.17	156.1	176.1	234.9
200000	22.42	7.72	152.7	173.9	233.8
225000	22.06	7.36	149.8	172.1	233.0
250000	21.70	7.00	146.8	170.4	232.1
275000	21.40	6.70	144.1	168.8	231.3
300000	21.16	6.46	141.9	167.5	230.8
400000	20.33	5.63	133.7	162.9	228.8
500000	19.77	5.07	127.6	159.4	227.3
600000	19.38	4.68	122.8	156.7	226.1
700000	19.04	4.34	120.0	154.6	225.1
800000	18.91	4.21	118.3	152.5	221.5
900000	18.77	4.07	114.8	150.2	216.3
1000000	18.71	4.01	114.0	148.1	211.2
1250000	18.72	4.02	115.7	145.1	204.4
1500000	18.59	3.89	112.2	142.9	199.0
1750000	18.62	3.92	114.4	140.7	193.7
2000000	18.59	3.89	113.8	138.7	188.4
2500000	18.52	3.82	113.0	134.6	177.9
3000000	18.49	3.79	112.5	132.5	172.9
3500000	18.47	3.77	112.2	131.1	169.2
4000000	18.45	3.75	111.8	129.6	165.5
5000000	18.40	3.70	111.0	126.7	158.1
6000000	18.35	3.65	110.2	123.7	150.7
7000000	18.32	3.62	109.9	122.5	147.6
8000000	18.29	3.59	109.6	121.4	144.9
9000050	18.28	3.58	109.3	120.3	142.2
10000050	18.25	3.55	109.0	119.2	139.4

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (254 seconds for Case 4)

COPATTA run I/O file: case4lca.dat/.lis

lcarslts.wb2

TABLE 9-4B: SUMMARY OF CONTAINMENT ENERGY AND CONTAINMENT HEAT REMOVAL HEAT TRANSFER FOR CASE 4

Time (seconds)	Steam Energy (Btu)	Air Energy (Btu)	Sump Energy (Btu)	Rx Vessel Energy (Btu)	Total Energy (Btu)	Integrated ECU Energy (Btu)	Integrated CS Ht Trans (Btu)	Heat Sink Net HT (Btu)	SDHX Duty (Btu/hr)	Integrated SDHX Ht Trans (Btu)
0.0	5.9260E+05	1.7809E+07	0.0000E+00	0	1.8405E+07	0	0	0.0000E+00	0	0
0.1	5.1170E+06	1.6885E+07	5.4591E+05	0	2.2548E+07	0	0	-5.9344E+02	0	0
0.2	7.9231E+06	1.7350E+07	1.4170E+06	0	2.6690E+07	0	0	-1.4243E+03	0	0
0.3	1.0917E+07	1.7708E+07	2.3109E+06	0	3.0936E+07	0	0	-1.7880E+03	0	0
0.4	1.4024E+07	1.7992E+07	3.2187E+06	0	3.5235E+07	0	0	-1.6339E+03	0	0
0.5	1.7157E+07	1.8250E+07	4.1358E+06	0	3.9542E+07	0	0	1.9702E+01	0	0
0.6	2.0273E+07	1.8502E+07	5.0567E+06	0	4.3832E+07	0	0	3.6206E+03	0	0
0.7	2.3518E+07	1.8672E+07	5.9143E+06	0	4.8105E+07	0	0	9.1410E+03	0	0
0.8	2.6741E+07	1.8844E+07	6.7763E+06	0	5.2361E+07	0	0	1.6485E+04	0	0
0.9	3.0003E+07	1.8962E+07	7.6342E+06	0	5.6599E+07	0	0	2.5785E+04	0	0
1	3.3265E+07	1.9104E+07	8.4504E+06	0	6.0820E+07	0	0	3.7084E+04	0	0
2	6.4086E+07	2.0052E+07	1.6283E+07	0	1.0042E+08	0	0	2.5304E+05	0	0
3	8.9525E+07	2.0580E+07	2.2819E+07	0	1.3292E+08	0	0	6.7975E+05	0	0
4	1.0856E+08	2.0767E+07	2.7511E+07	0	1.5684E+08	0	0	1.3255E+06	0	0
5	1.2396E+08	2.1125E+07	3.1670E+07	0	1.7676E+08	0	0	2.1704E+06	0	0
6	1.3818E+08	2.1181E+07	3.5521E+07	0	1.9488E+08	0	0	3.2008E+06	0	0
7	1.5084E+08	2.1427E+07	3.9123E+07	0	2.1139E+08	0	0	4.3973E+06	0	0
8	1.6237E+08	2.1563E+07	4.2596E+07	0	2.2653E+08	0	0	5.7445E+06	0	0
9	1.7287E+08	2.1710E+07	4.5944E+07	0	2.4053E+08	0	0	7.2188E+06	0	0
10	1.8249E+08	2.1806E+07	4.8755E+07	0	2.5305E+08	0	0	8.8036E+06	0	0
11	1.9106E+08	2.1879E+07	5.0922E+07	0	2.6386E+08	0	0	1.0478E+07	0	0
12	1.9825E+08	2.1972E+07	5.2721E+07	0	2.7294E+08	0	0	1.2220E+07	0	0
13	2.0320E+08	2.2018E+07	5.4262E+07	0	2.7948E+08	0	0	1.4005E+07	0	0
14	2.0616E+08	2.2049E+07	5.5820E+07	0	2.8403E+08	0	0	1.5808E+07	0	0
15	2.0804E+08	2.2068E+07	5.7325E+07	0	2.8743E+08	0	0	1.7611E+07	0	0
16	2.0893E+08	2.2059E+07	5.8508E+07	0	2.8949E+08	0	0	1.9396E+07	0	0
17	2.0889E+08	2.2074E+07	5.9395E+07	0	2.9036E+08	0	0	2.1150E+07	0	0
18	2.0834E+08	2.2067E+07	6.0146E+07	0	2.9055E+08	0	0	2.2818E+07	0	0
19	2.0704E+08	2.2046E+07	6.0718E+07	0	2.8961E+08	0	0	2.4346E+07	0	0
20	2.0572E+08	2.2039E+07	6.1102E+07	0	2.8886E+08	0	0	2.5738E+07	0	0
22	2.0407E+08	2.2041E+07	6.1911E+07	0	2.8802E+08	0	0	2.8232E+07	0	0
24	2.0316E+08	2.2065E+07	6.3847E+07	0	2.8907E+08	0	0	3.0418E+07	0	0
26	2.0196E+08	2.2074E+07	6.6032E+07	0	2.9007E+08	0	0	3.2358E+07	0	0
28	2.0102E+08	2.2082E+07	6.8070E+07	0	2.9117E+08	0	0	3.4091E+07	0	0
30	2.0029E+08	2.2094E+07	6.9976E+07	0	2.9236E+08	0	0	3.5649E+07	0	0
32	1.9973E+08	2.2109E+07	7.1764E+07	0	2.9361E+08	0	0	3.7059E+07	0	0
34	1.9933E+08	2.2126E+07	7.3455E+07	0	2.9491E+08	0	5.3369E+02	3.8339E+07	0	0
36	1.9908E+08	2.2138E+07	7.5053E+07	0	2.9627E+08	0	4.5865E+03	3.9504E+07	0	0
38	1.9894E+08	2.2146E+07	7.6573E+07	0	2.9766E+08	0	1.1358E+04	4.0570E+07	0	0
40	1.9885E+08	2.2151E+07	7.8033E+07	0	2.9903E+08	0	2.0627E+04	4.1599E+07	0	0
42	1.9879E+08	2.2148E+07	7.9439E+07	0	3.0037E+08	0	3.3592E+04	4.2607E+07	0	0
44	1.9876E+08	2.2135E+07	8.0798E+07	0	3.0169E+08	0	5.1426E+04	4.3594E+07	0	0
46	1.9876E+08	2.2114E+07	8.2110E+07	0	3.0298E+08	0	7.3645E+04	4.4560E+07	0	0

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇓

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

48	1.9878E+08	2.2088E+07	8.3381E+07	0	3.0425E+08	0	9.7636E+04	4.5506E+07	0	0
50	1.9882E+08	2.2061E+07	8.4611E+07	0	3.0550E+08	0	1.2294E+05	4.6433E+07	0	0
52	1.9889E+08	2.2031E+07	8.5804E+07	0	3.0672E+08	0	1.4932E+05	4.7340E+07	0	0
54	1.9897E+08	2.1999E+07	8.6964E+07	0	3.0793E+08	0	1.7654E+05	4.8230E+07	0	0
56	1.9904E+08	2.1984E+07	8.8108E+07	0	3.0913E+08	0	2.0640E+05	4.9101E+07	0	0
58	1.9906E+08	2.1989E+07	8.9257E+07	0	3.1031E+08	0	2.4979E+05	4.9957E+07	0	0
60	1.9910E+08	2.1985E+07	9.0399E+07	0	3.1148E+08	1.8924E+03	3.0856E+05	5.0797E+07	0	0
62	1.9910E+08	2.1971E+07	9.1531E+07	0	3.1260E+08	3.9739E+04	3.7501E+05	5.1621E+07	0	0
64	1.9907E+08	2.1987E+07	9.2642E+07	0	3.1370E+08	7.7586E+04	4.4143E+05	5.2431E+07	0	0
66	1.9908E+08	2.1989E+07	9.3727E+07	0	3.1479E+08	1.1543E+05	5.0786E+05	5.3227E+07	0	0
68	1.9910E+08	2.1988E+07	9.4783E+07	0	3.1587E+08	1.5329E+05	5.7432E+05	5.4009E+07	0	0
70	1.9912E+08	2.1990E+07	9.5816E+07	0	3.1693E+08	1.9114E+05	6.4077E+05	5.4777E+07	0	0
72	1.9916E+08	2.1989E+07	9.6824E+07	0	3.1797E+08	2.2900E+05	7.0724E+05	5.5533E+07	0	0
74	1.9921E+08	2.1991E+07	9.7816E+07	0	3.1901E+08	2.6687E+05	7.7371E+05	5.6276E+07	0	0
76	1.9926E+08	2.1992E+07	9.8790E+07	0	3.2004E+08	3.0474E+05	8.4021E+05	5.7007E+07	0	0
78	1.9933E+08	2.1991E+07	9.9745E+07	0	3.2106E+08	3.4262E+05	9.0672E+05	5.7727E+07	0	0
80	1.9940E+08	2.1992E+07	1.0068E+08	0	3.2207E+08	3.8051E+05	9.7322E+05	5.8435E+07	0	0
82	1.9947E+08	2.1993E+07	1.0161E+08	0	3.2307E+08	4.1840E+05	1.0397E+06	5.9132E+07	0	0
84	1.9953E+08	2.1991E+07	1.0251E+08	0	3.2404E+08	4.5631E+05	1.1063E+06	5.9819E+07	0	0
86	1.9957E+08	2.1987E+07	1.0341E+08	0	3.2497E+08	4.9422E+05	1.1728E+06	6.0494E+07	0	0
88	1.9958E+08	2.1988E+07	1.0431E+08	0	3.2588E+08	5.3213E+05	1.2393E+06	6.1159E+07	0	0
90	1.9958E+08	2.1987E+07	1.0521E+08	0	3.2677E+08	5.7003E+05	1.3057E+06	6.1813E+07	0	0
92	2.0010E+08	2.2085E+07	1.0578E+08	0	3.2796E+08	6.0795E+05	1.3722E+06	6.2458E+07	0	0
94	2.0094E+08	2.2180E+07	1.0614E+08	0	3.2925E+08	6.4596E+05	1.4389E+06	6.3097E+07	0	0
96	2.0174E+08	2.2270E+07	1.0649E+08	0	3.3049E+08	6.8405E+05	1.5057E+06	6.3732E+07	0	0
98	2.0249E+08	2.2369E+07	1.0683E+08	0	3.3168E+08	7.2222E+05	1.5726E+06	6.4362E+07	0	0
100	2.0319E+08	2.2466E+07	1.0716E+08	0	3.3282E+08	7.6048E+05	1.6395E+06	6.4986E+07	0	0
105	2.0472E+08	2.2482E+07	1.0800E+08	0	3.3520E+08	8.5644E+05	1.8074E+06	6.6525E+07	0	0
110	2.0600E+08	2.2492E+07	1.0884E+08	0	3.3733E+08	9.5279E+05	1.9761E+06	6.8031E+07	0	0
115	2.0705E+08	2.2504E+07	1.0967E+08	0	3.3922E+08	1.0495E+06	2.1453E+06	6.9500E+07	0	0
120	2.0790E+08	2.2512E+07	1.1051E+08	0	3.4091E+08	1.1464E+06	2.3150E+06	7.0931E+07	0	0
125	2.0858E+08	2.2517E+07	1.1134E+08	0	3.4243E+08	1.2436E+06	2.4851E+06	7.2322E+07	0	0
130	2.0910E+08	2.2516E+07	1.1219E+08	0	3.4381E+08	1.3409E+06	2.6554E+06	7.3672E+07	0	0
135	2.0949E+08	2.2516E+07	1.1305E+08	0	3.4505E+08	1.4383E+06	2.8259E+06	7.4982E+07	0	0
140	2.0975E+08	2.2519E+07	1.1392E+08	0	3.4616E+08	1.5359E+06	2.9965E+06	7.6251E+07	0	0
145	2.0990E+08	2.2521E+07	1.1480E+08	0	3.4723E+08	1.6335E+06	3.1673E+06	7.7480E+07	0	0
150	2.0997E+08	2.2525E+07	1.1570E+08	0	3.4819E+08	1.7311E+06	3.3381E+06	7.8671E+07	0	0
155	2.0996E+08	2.2523E+07	1.1660E+08	0	3.4908E+08	1.8287E+06	3.5089E+06	7.9824E+07	0	0
160	2.0988E+08	2.2521E+07	1.1751E+08	0	3.4991E+08	1.9264E+06	3.6797E+06	8.0940E+07	0	0
165	2.0975E+08	2.2524E+07	1.1843E+08	0	3.5070E+08	2.0240E+06	3.8504E+06	8.2021E+07	0	0
170	2.0956E+08	2.2518E+07	1.1935E+08	0	3.5143E+08	2.1215E+06	4.0211E+06	8.3068E+07	0	0
175	2.0933E+08	2.2515E+07	1.2028E+08	0	3.5213E+08	2.2190E+06	4.1917E+06	8.4083E+07	0	0
180	2.0903E+08	2.2518E+07	1.2123E+08	0	3.5278E+08	2.3165E+06	4.3621E+06	8.5066E+07	0	0
185	2.0873E+08	2.2513E+07	1.2225E+08	0	3.5349E+08	2.4138E+06	4.5324E+06	8.6019E+07	0	0
190	2.0844E+08	2.2505E+07	1.2334E+08	0	3.5429E+08	2.5111E+06	4.7025E+06	8.6945E+07	0	0
195	2.0814E+08	2.2506E+07	1.2450E+08	0	3.5515E+08	2.6083E+06	4.8724E+06	8.7845E+07	0	0
200	2.0784E+08	2.2503E+07	1.2574E+08	0	3.5608E+08	2.7054E+06	5.0423E+06	8.8719E+07	0	0
205	2.0753E+08	2.2494E+07	1.2698E+08	0	3.5701E+08	2.8024E+06	5.2119E+06	8.9570E+07	0	0
210	2.0720E+08	2.2498E+07	1.2823E+08	0	3.5793E+08	2.8993E+06	5.3814E+06	9.0398E+07	0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO. | PAGE ___ OF ___

CCN CONVERSION: CCN NO. CCN –

Project or DCP/FCN ___ SONGS 2 & 3 ___ Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 193 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

215	2.0687E+08	2.2490E+07	1.2948E+08	0	3.5884E+08	2.9962E+06	5.5508E+06	9.1204E+07	0	0
220	2.0654E+08	2.2481E+07	1.3073E+08	0	3.5976E+08	3.0929E+06	5.7199E+06	9.1990E+07	0	0
225	2.0619E+08	2.2484E+07	1.3199E+08	0	3.6066E+08	3.1896E+06	5.8889E+06	9.2756E+07	0	0
230	2.0583E+08	2.2485E+07	1.3324E+08	0	3.6156E+08	3.2861E+06	6.0577E+06	9.3503E+07	0	0
235	2.0549E+08	2.2470E+07	1.3449E+08	0	3.6245E+08	3.3826E+06	6.2264E+06	9.4231E+07	0	0
240	2.0512E+08	2.2478E+07	1.3575E+08	0	3.6334E+08	3.4790E+06	6.3948E+06	9.4942E+07	0	0
245	2.0476E+08	2.2471E+07	1.3700E+08	0	3.6423E+08	3.5753E+06	6.5631E+06	9.5636E+07	0	0
250	2.0439E+08	2.2470E+07	1.3825E+08	0	3.6512E+08	3.6714E+06	6.7312E+06	9.6314E+07	0	0
255	2.0398E+08	2.2458E+07	1.4169E+08	4.8187E+07	4.1632E+08	3.7675E+06	6.8991E+06	9.6976E+07	0	0
260	2.0328E+08	2.2449E+07	1.4355E+08	4.8160E+07	4.1743E+08	3.8634E+06	7.0667E+06	9.7621E+07	0	0
265	2.0258E+08	2.2448E+07	1.4498E+08	4.8135E+07	4.1814E+08	3.9592E+06	7.2339E+06	9.8248E+07	0	0
270	2.0191E+08	2.2437E+07	1.4639E+08	4.8111E+07	4.1885E+08	4.0547E+06	7.4008E+06	9.8858E+07	0	0
275	2.0127E+08	2.2422E+07	1.4781E+08	4.8088E+07	4.1959E+08	4.1501E+06	7.5674E+06	9.9452E+07	0	0
280	2.0061E+08	2.2428E+07	1.4922E+08	4.8065E+07	4.2033E+08	4.2452E+06	7.7336E+06	1.0003E+08	0	0
285	1.9999E+08	2.2420E+07	1.5063E+08	4.8043E+07	4.2108E+08	4.3403E+06	7.8995E+06	1.0060E+08	0	0
290	1.9937E+08	2.2426E+07	1.5203E+08	4.8020E+07	4.2185E+08	4.4351E+06	8.0650E+06	1.0115E+08	0	0
295	1.9878E+08	2.2417E+07	1.5343E+08	4.8000E+07	4.2263E+08	4.5298E+06	8.2302E+06	1.0169E+08	0	0
300	1.9819E+08	2.2416E+07	1.5483E+08	4.7979E+07	4.2341E+08	4.6243E+06	8.3949E+06	1.0221E+08	0	0
310	1.9705E+08	2.2397E+07	1.5761E+08	4.7947E+07	4.2501E+08	4.8129E+06	8.7230E+06	1.0323E+08	0	0
320	1.9597E+08	2.2382E+07	1.6038E+08	4.7901E+07	4.2664E+08	5.0009E+06	9.0495E+06	1.0421E+08	0	0
330	1.9499E+08	2.2286E+07	1.6314E+08	4.7876E+07	4.2829E+08	5.1884E+06	9.3748E+06	1.0515E+08	0	0
340	1.9382E+08	2.2377E+07	1.6592E+08	4.7844E+07	4.2996E+08	5.3754E+06	9.6986E+06	1.0607E+08	0	0
350	1.9282E+08	2.2363E+07	1.6867E+08	4.7799E+07	4.3165E+08	5.5618E+06	1.0021E+07	1.0696E+08	0	0
360	1.9183E+08	2.2354E+07	1.7140E+08	4.7765E+07	4.3335E+08	5.7477E+06	1.0341E+07	1.0782E+08	0	0
370	1.9085E+08	2.2344E+07	1.7413E+08	4.7740E+07	4.3507E+08	5.9331E+06	1.0660E+07	1.0866E+08	0	0
380	1.8989E+08	2.2339E+07	1.7687E+08	4.7705E+07	4.3680E+08	6.1180E+06	1.0978E+07	1.0947E+08	0	0
390	1.8896E+08	2.2323E+07	1.7958E+08	4.7671E+07	4.3854E+08	6.3023E+06	1.1295E+07	1.1026E+08	0	0
400	1.8805E+08	2.2311E+07	1.8230E+08	4.7639E+07	4.4030E+08	6.4862E+06	1.1610E+07	1.1103E+08	0	0
420	1.8634E+08	2.2240E+07	1.8769E+08	4.7580E+07	4.4385E+08	6.8525E+06	1.2236E+07	1.1251E+08	0	0
440	1.8464E+08	2.2226E+07	1.9306E+08	4.7520E+07	4.4745E+08	7.2170E+06	1.2857E+07	1.1392E+08	0	0
460	1.8302E+08	2.2212E+07	1.9842E+08	4.7463E+07	4.5111E+08	7.5796E+06	1.3473E+07	1.1526E+08	0	0
480	1.8147E+08	2.2192E+07	2.0374E+08	4.7408E+07	4.5481E+08	7.9406E+06	1.4084E+07	1.1653E+08	0	0
500	1.7937E+08	2.2230E+07	2.0913E+08	4.7004E+07	4.5773E+08	8.2996E+06	1.4691E+07	1.1775E+08	0	0
520	1.7689E+08	2.2204E+07	2.1445E+08	4.6160E+07	4.5971E+08	8.6556E+06	1.5290E+07	1.1889E+08	0	0
540	1.7452E+08	2.2179E+07	2.1967E+08	4.5371E+07	4.6174E+08	9.0086E+06	1.5882E+07	1.1996E+08	0	0
560	1.7223E+08	2.2153E+07	2.2481E+08	4.4630E+07	4.6382E+08	9.3587E+06	1.6468E+07	1.2096E+08	0	0
580	1.7001E+08	2.2129E+07	2.2986E+08	4.3932E+07	4.6593E+08	9.7060E+06	1.7046E+07	1.2192E+08	0	0
600	1.6785E+08	2.2106E+07	2.3483E+08	4.3275E+07	4.6806E+08	1.0051E+07	1.7618E+07	1.2284E+08	0	0
650	1.6268E+08	2.2055E+07	2.4696E+08	4.1788E+07	4.7348E+08	1.0902E+07	1.9024E+07	1.2499E+08	0	0
700	1.5784E+08	2.1999E+07	2.5867E+08	4.0504E+07	4.7901E+08	1.1739E+07	2.0394E+07	1.2694E+08	0	0
750	1.5328E+08	2.1944E+07	2.7003E+08	3.9375E+07	4.8462E+08	1.2561E+07	2.1733E+07	1.2871E+08	0	0
800	1.4895E+08	2.1892E+07	2.8108E+08	3.8370E+07	4.9029E+08	1.3369E+07	2.3046E+07	1.3033E+08	0	0
850	1.4484E+08	2.1841E+07	2.9185E+08	3.7466E+07	4.9600E+08	1.4163E+07	2.4334E+07	1.3181E+08	0	0
900	1.4093E+08	2.1792E+07	3.0237E+08	3.6642E+07	5.0174E+08	1.4942E+07	2.5597E+07	1.3317E+08	0	0
950	1.3721E+08	2.1743E+07	3.1265E+08	3.5887E+07	5.0749E+08	1.5707E+07	2.6838E+07	1.3442E+08	0	0
1000	1.3361E+08	2.1702E+07	3.2273E+08	3.5186E+07	5.1323E+08	1.6461E+07	2.8059E+07	1.3558E+08	0	0
1050	1.3018E+08	2.1657E+07	3.3260E+08	3.4556E+07	5.1899E+08	1.7202E+07	2.9261E+07	1.3665E+08	0	0
1100	1.2688E+08	2.1611E+07	3.4231E+08	3.4013E+07	5.2481E+08	1.7932E+07	3.0444E+07	1.3764E+08	0	0
1150	1.2372E+08	2.1567E+07	3.5186E+08	3.3543E+07	5.3069E+08	1.8651E+07	3.1609E+07	1.3855E+08	0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 194 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇒

1200	1.2069E+08	2.1522E+07	3.6127E+08	3.3133E+07	5.3662E+08	1.9358E+07	3.2758E+07	1.3938E+08	0	0
1220	1.1951E+08	2.1505E+07	3.6500E+08	3.2983E+07	5.3900E+08	1.9638E+07	3.3210E+07	1.3969E+08	0	0
1240	1.1836E+08	2.1488E+07	3.6871E+08	3.2840E+07	5.4140E+08	1.9916E+07	3.3661E+07	1.3999E+08	0	0
1260	1.1722E+08	2.1471E+07	3.7240E+08	3.2704E+07	5.4380E+08	2.0191E+07	3.4110E+07	1.4028E+08	0	0
1280	1.1611E+08	2.1455E+07	3.7608E+08	3.2574E+07	5.4621E+08	2.0465E+07	3.4556E+07	1.4056E+08	0	0
1300	1.1501E+08	2.1438E+07	3.7973E+08	3.2449E+07	5.4863E+08	2.0737E+07	3.5000E+07	1.4083E+08	0	0
1320	1.1392E+08	2.1422E+07	3.8337E+08	3.2330E+07	5.5105E+08	2.1007E+07	3.5441E+07	1.4109E+08	0	0
1340	1.1286E+08	2.1406E+07	3.8700E+08	3.2215E+07	5.5347E+08	2.1275E+07	3.5880E+07	1.4134E+08	0	0
1360	1.1181E+08	2.1390E+07	3.9061E+08	3.2105E+07	5.5591E+08	2.1542E+07	3.6316E+07	1.4158E+08	0	0
1380	1.1077E+08	2.1373E+07	3.9420E+08	3.1998E+07	5.5834E+08	2.1806E+07	3.6750E+07	1.4181E+08	0	0
1400	1.0975E+08	2.1358E+07	3.9778E+08	3.1896E+07	5.6078E+08	2.2069E+07	3.7182E+07	1.4204E+08	0	0
1450	1.0726E+08	2.1318E+07	4.0667E+08	3.1653E+07	5.6690E+08	2.2719E+07	3.8250E+07	1.4257E+08	0	0
1500	1.0482E+08	2.1286E+07	4.1548E+08	3.1427E+07	5.7301E+08	2.3360E+07	3.9306E+07	1.4307E+08	0	0
1550	1.0247E+08	2.1248E+07	4.2422E+08	3.1215E+07	5.7915E+08	2.3992E+07	4.0347E+07	1.4353E+08	0	0
1600	1.0020E+08	2.1210E+07	4.3288E+08	3.1014E+07	5.8530E+08	2.4614E+07	4.1375E+07	1.4396E+08	0	0
1650	9.7994E+07	2.1172E+07	4.4147E+08	3.0823E+07	5.9146E+08	2.5227E+07	4.2389E+07	1.4434E+08	0	0
1700	9.5860E+07	2.1135E+07	4.4999E+08	3.0639E+07	5.9762E+08	2.5831E+07	4.3391E+07	1.4470E+08	0	0
1750	9.3789E+07	2.1099E+07	4.5845E+08	3.0461E+07	6.0379E+08	2.6427E+07	4.4380E+07	1.4502E+08	0	0
1800	9.1782E+07	2.1063E+07	4.6684E+08	3.0288E+07	6.0997E+08	2.7015E+07	4.5357E+07	1.4531E+08	0	0
1850	8.9848E+07	2.1027E+07	4.7517E+08	3.0124E+07	6.1617E+08	2.7593E+07	4.6322E+07	1.4556E+08	0	0
1900	8.7980E+07	2.0993E+07	4.8344E+08	2.9971E+07	6.2239E+08	2.8161E+07	4.7276E+07	1.4578E+08	0	0
1950	8.6175E+07	2.0959E+07	4.9166E+08	2.9826E+07	6.2862E+08	2.8720E+07	4.8218E+07	1.4598E+08	0	0
2000	8.4425E+07	2.0925E+07	4.9983E+08	2.9689E+07	6.3487E+08	2.9271E+07	4.9149E+07	1.4612E+08	0	0
2050	8.2716E+07	2.0897E+07	5.0795E+08	2.9557E+07	6.4111E+08	2.9814E+07	5.0070E+07	1.4626E+08	0	0
2100	8.1056E+07	2.0864E+07	5.1602E+08	2.9430E+07	6.4737E+08	3.0350E+07	5.0981E+07	1.4638E+08	0	0
2150	7.9444E+07	2.0831E+07	5.2404E+08	2.9307E+07	6.5362E+08	3.0878E+07	5.1881E+07	1.4648E+08	0	0
2200	7.7876E+07	2.0799E+07	5.3202E+08	2.9188E+07	6.5988E+08	3.1399E+07	5.2770E+07	1.4656E+08	0	0
2250	7.6352E+07	2.0767E+07	5.3995E+08	2.9070E+07	6.6614E+08	3.1912E+07	5.3650E+07	1.4662E+08	0	0
2300	7.4869E+07	2.0736E+07	5.4784E+08	2.8955E+07	6.7240E+08	3.2418E+07	5.4520E+07	1.4666E+08	0	0
2350	7.3429E+07	2.0705E+07	5.5569E+08	2.8842E+07	6.7867E+08	3.2916E+07	5.5381E+07	1.4668E+08	0	0
2400	7.2036E+07	2.0675E+07	5.6350E+08	2.8730E+07	6.8494E+08	3.3407E+07	5.6232E+07	1.4668E+08	0	0
2420	7.1493E+07	2.0661E+07	5.6661E+08	2.8686E+07	6.8745E+08	3.3601E+07	5.6570E+07	1.4667E+08	0	0
2440	7.1003E+07	2.0630E+07	5.6891E+08	2.8962E+07	6.8951E+08	3.3794E+07	5.6885E+07	1.4667E+08	6.9379E+07	9.6360E+04
2460	7.0569E+07	2.0621E+07	5.6884E+08	3.0182E+07	6.9021E+08	3.3986E+07	5.7132E+07	1.4666E+08	6.9331E+07	4.8163E+05
2480	7.0140E+07	2.0610E+07	5.6879E+08	3.1377E+07	6.9091E+08	3.4177E+07	5.7378E+07	1.4664E+08	6.9288E+07	8.6665E+05
2500	6.9715E+07	2.0600E+07	5.6875E+08	3.2547E+07	6.9161E+08	3.4368E+07	5.7623E+07	1.4663E+08	6.9248E+07	1.2514E+06
2600	6.7632E+07	2.0555E+07	5.6886E+08	3.8036E+07	6.9509E+08	3.5306E+07	5.8832E+07	1.4656E+08	6.9111E+07	3.1728E+06
2700	6.6891E+07	2.0551E+07	5.6903E+08	4.2039E+07	6.9851E+08	3.6224E+07	6.0010E+07	1.4646E+08	6.9044E+07	5.0914E+06
2800	7.0592E+07	2.0614E+07	5.6803E+08	4.2257E+07	7.0149E+08	3.7161E+07	6.1218E+07	1.4670E+08	6.8959E+07	7.0080E+06
2900	7.3699E+07	2.0711E+07	5.6719E+08	4.2448E+07	7.0405E+08	3.8135E+07	6.2478E+07	1.4726E+08	6.8887E+07	8.9224E+06
3000	7.6408E+07	2.0770E+07	5.6648E+08	4.2613E+07	7.0627E+08	3.9140E+07	6.3784E+07	1.4806E+08	6.8827E+07	1.0835E+07
3100	7.8808E+07	2.0820E+07	5.6587E+08	4.2757E+07	7.0826E+08	4.0171E+07	6.5129E+07	1.4901E+08	6.8779E+07	1.2746E+07
3200	8.0941E+07	2.0863E+07	5.6536E+08	4.2886E+07	7.1005E+08	4.1224E+07	6.6507E+07	1.5008E+08	6.8740E+07	1.4656E+07
3300	8.2841E+07	2.0902E+07	5.6492E+08	4.3000E+07	7.1166E+08	4.2296E+07	6.7915E+07	1.5124E+08	6.8710E+07	1.6565E+07
3400	8.4540E+07	2.0934E+07	5.6455E+08	4.3092E+07	7.1312E+08	4.3384E+07	6.9347E+07	1.5247E+08	6.8690E+07	1.8473E+07
3500	8.6016E+07	2.0962E+07	5.6425E+08	4.3180E+07	7.1441E+08	4.4488E+07	7.0801E+07	1.5380E+08	6.8675E+07	2.0381E+07
3600	8.7353E+07	2.0985E+07	5.6400E+08	4.3260E+07	7.1560E+08	4.5605E+07	7.2276E+07	1.5514E+08	6.8666E+07	2.2289E+07
3700	8.8572E+07	2.1006E+07	5.6380E+08	4.3332E+07	7.1671E+08	4.6735E+07	7.3768E+07	1.5652E+08	6.8663E+07	2.4196E+07
3800	8.9694E+07	2.1028E+07	5.6363E+08	4.3399E+07	7.1775E+08	4.7876E+07	7.5276E+07	1.5791E+08	6.8664E+07	2.6103E+07

E&TS DEPARTMENT

CALCULATION SHEET

Project or DCP/FCN SONGS 2 & 3 Calc. No. N-4080-026

ICCN NO./ PRELIM. CCN NO. | PAGE __ OF __

CCN CONVERSION: CCN NO. CCN –

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 195 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

3900	9.0722E+07	2.1054E+07	5.6350E+08	4.3461E+07	7.1874E+08	4.9029E+07	7.6800E+07	1.5932E+08	6.8670E+07	2.8011E+07
4000	9.1686E+07	2.1070E+07	5.6340E+08	4.3513E+07	7.1967E+08	5.0192E+07	7.8337E+07	1.6074E+08	6.8680E+07	2.9918E+07
4500	9.5675E+07	2.1126E+07	5.6326E+08	4.3718E+07	7.2378E+08	5.6121E+07	8.6190E+07	1.6781E+08	6.8776E+07	3.9463E+07
5000	9.8476E+07	2.1131E+07	5.6362E+08	4.3867E+07	7.2710E+08	6.2191E+07	9.4261E+07	1.7475E+08	6.8939E+07	4.9027E+07
5500	1.0025E+08	2.1203E+07	5.6434E+08	4.3968E+07	7.2976E+08	6.8356E+07	1.0248E+08	1.8144E+08	6.9142E+07	5.8616E+07
6000	1.0133E+08	2.1223E+07	5.6527E+08	4.4024E+07	7.3185E+08	7.4582E+07	1.1078E+08	1.8785E+08	6.9369E+07	6.8235E+07
6500	1.0181E+08	2.1230E+07	5.6634E+08	4.4047E+07	7.3343E+08	8.0840E+07	1.1912E+08	1.9394E+08	6.9606E+07	7.7887E+07
7000	1.0184E+08	2.1211E+07	5.6747E+08	4.4049E+07	7.3457E+08	8.7106E+07	1.2747E+08	1.9965E+08	6.9840E+07	8.7572E+07
7500	1.0150E+08	2.1197E+07	5.6861E+08	4.4032E+07	7.3534E+08	9.3369E+07	1.3579E+08	2.0502E+08	7.0065E+07	9.7288E+07
8000	1.0120E+08	2.1199E+07	5.6966E+08	4.4016E+07	7.3607E+08	9.9616E+07	1.4409E+08	2.1012E+08	7.0273E+07	1.0704E+08
8500	1.0093E+08	2.1195E+07	5.7063E+08	4.4002E+07	7.3675E+08	1.0585E+08	1.5235E+08	2.1499E+08	7.0465E+07	1.1681E+08
9000	1.0064E+08	2.1190E+07	5.7154E+08	4.3987E+07	7.3735E+08	1.1208E+08	1.6059E+08	2.1968E+08	7.0644E+07	1.2661E+08
9500	1.0032E+08	2.1183E+07	5.7238E+08	4.3970E+07	7.3786E+08	1.1829E+08	1.6880E+08	2.2418E+08	7.0809E+07	1.3643E+08
10000	9.9962E+07	2.1175E+07	5.7317E+08	4.3952E+07	7.3826E+08	1.2448E+08	1.7698E+08	2.2853E+08	7.0960E+07	1.4628E+08
12500	9.7749E+07	2.1128E+07	5.7622E+08	4.3838E+07	7.3893E+08	1.5522E+08	2.1738E+08	2.4813E+08	7.1535E+07	1.9578E+08
15000	9.4721E+07	2.1085E+07	5.7789E+08	4.3680E+07	7.3738E+08	1.8541E+08	2.5683E+08	2.6473E+08	7.1785E+07	2.4557E+08
17500	9.0915E+07	2.1010E+07	5.7823E+08	4.3481E+07	7.3364E+08	2.1488E+08	2.9511E+08	2.7867E+08	7.1735E+07	2.9542E+08
20000	8.7262E+07	2.0951E+07	5.7723E+08	4.3265E+07	7.2871E+08	2.4341E+08	3.3212E+08	2.9030E+08	7.1413E+07	3.4513E+08
22500	8.4295E+07	2.0896E+07	5.7528E+08	4.3089E+07	7.2356E+08	2.7114E+08	3.6811E+08	3.0062E+08	7.0898E+07	3.9455E+08
25000	8.1400E+07	2.0815E+07	5.7286E+08	4.2928E+07	7.1800E+08	2.9818E+08	4.0323E+08	3.0994E+08	7.0306E+07	4.4358E+08
27500	7.8563E+07	2.0774E+07	5.7007E+08	4.2759E+07	7.1216E+08	3.2455E+08	4.3749E+08	3.1820E+08	6.9642E+07	4.9217E+08
30000	7.5710E+07	2.0713E+07	5.6699E+08	4.2589E+07	7.0600E+08	3.5024E+08	4.7086E+08	3.2549E+08	6.8918E+07	5.4028E+08
35000	7.0066E+07	2.0593E+07	5.6013E+08	4.2251E+07	6.9304E+08	3.9939E+08	5.3492E+08	3.3713E+08	6.7334E+07	6.3491E+08
40000	6.4937E+07	2.0483E+07	5.5264E+08	4.1949E+07	6.8000E+08	4.4560E+08	5.9545E+08	3.4575E+08	6.5640E+07	7.2724E+08
45000	6.1007E+07	2.0388E+07	5.4518E+08	4.1680E+07	6.6826E+08	4.8938E+08	6.5308E+08	3.5261E+08	6.3994E+07	8.1724E+08
50000	5.7394E+07	2.0293E+07	5.3823E+08	4.1428E+07	6.5735E+08	5.3090E+08	7.0838E+08	3.5781E+08	6.2348E+07	9.0490E+08
55000	5.3826E+07	2.0193E+07	5.3163E+08	4.1186E+07	6.4684E+08	5.7030E+08	7.6124E+08	3.6188E+08	6.0894E+07	9.9047E+08
60000	5.0997E+07	2.0121E+07	5.2534E+08	4.0986E+07	6.3744E+08	6.0782E+08	8.1185E+08	3.6524E+08	5.9527E+07	1.0741E+09
65000	4.8701E+07	2.0053E+07	5.1965E+08	4.0824E+07	6.2923E+08	6.4369E+08	8.6059E+08	3.6807E+08	5.8301E+07	1.1559E+09
70000	4.6624E+07	1.9989E+07	5.1461E+08	4.0677E+07	6.2190E+08	6.7801E+08	9.0771E+08	3.7035E+08	5.7192E+07	1.2361E+09
75000	4.4724E+07	1.9929E+07	5.1000E+08	4.0542E+07	6.1520E+08	7.1098E+08	9.5325E+08	3.7215E+08	5.6200E+07	1.3148E+09
80000	4.3028E+07	1.9872E+07	5.0584E+08	4.0426E+07	6.0917E+08	7.4279E+08	9.9737E+08	3.7372E+08	5.5305E+07	1.3922E+09
85000	4.1523E+07	1.9823E+07	5.0204E+08	4.0318E+07	6.0370E+08	7.7353E+08	1.0402E+09	3.7503E+08	5.4489E+07	1.4684E+09
90000	4.0204E+07	1.9778E+07	4.9852E+08	4.0223E+07	5.9873E+08	8.0332E+08	1.0817E+09	3.7614E+08	5.3738E+07	1.5436E+09
95000	3.9074E+07	1.9737E+07	4.9536E+08	4.0141E+07	5.9431E+08	8.3230E+08	1.1222E+09	3.7722E+08	5.3064E+07	1.6177E+09
100000	3.8107E+07	1.9703E+07	4.9251E+08	4.0062E+07	5.9038E+08	8.6056E+08	1.1617E+09	3.7822E+08	5.2458E+07	1.6910E+09
125000	3.4353E+07	1.9558E+07	4.8181E+08	3.9742E+07	5.7547E+08	9.9288E+08	1.3480E+09	3.8178E+08	5.0142E+07	2.0467E+09
150000	3.1225E+07	1.9424E+07	4.7339E+08	3.9470E+07	5.6351E+08	1.1125E+09	1.5170E+09	3.8192E+08	4.8350E+07	2.3888E+09
175000	2.8300E+07	1.9289E+07	4.6536E+08	3.9215E+07	5.5217E+08	1.2199E+09	1.6688E+09	3.7911E+08	4.6647E+07	2.7184E+09
200000	2.6158E+07	1.9184E+07	4.5842E+08	3.9023E+07	5.4278E+08	1.3173E+09	1.8054E+09	3.7453E+08	4.5184E+07	3.0371E+09
225000	2.4463E+07	1.9094E+07	4.5287E+08	3.8870E+07	5.3530E+08	1.4061E+09	1.9296E+09	3.6891E+08	4.4018E+07	3.3467E+09
250000	2.2760E+07	1.8999E+07	4.4752E+08	3.8716E+07	5.2800E+08	1.4874E+09	2.0422E+09	3.6236E+08	4.2894E+07	3.6485E+09
275000	2.1343E+07	1.8916E+07	4.4233E+08	3.8585E+07	5.2117E+08	1.5616E+09	2.1429E+09	3.5521E+08	4.1814E+07	3.9425E+09
300000	2.0252E+07	1.8848E+07	4.3822E+08	3.8482E+07	5.1580E+08	1.6306E+09	2.2344E+09	3.4820E+08	4.0957E+07	4.2298E+09
400000	1.6562E+07	1.8592E+07	4.2393E+08	3.8128E+07	4.9721E+08	1.8605E+09	2.5183E+09	3.1747E+08	3.7985E+07	5.3259E+09
500000	1.4165E+07	1.8393E+07	4.1259E+08	3.7863E+07	4.8301E+08	2.0262E+09	2.6817E+09	2.8265E+08	3.5592E+07	6.3434E+09
600000	1.2517E+07	1.8250E+07	4.0431E+08	3.7652E+07	4.7272E+08	2.1535E+09	2.7649E+09	2.5114E+08	3.3885E+07	7.3082E+09
700000	1.0841E+07	1.8161E+07	3.9762E+08	3.7470E+07	4.6409E+08	2.2418E+09	2.7851E+09	2.2058E+08	3.2498E+07	8.2307E+09
800000	1.0313E+07	1.8107E+07	3.9066E+08	3.6827E+07	4.5590E+08	2.3103E+09	2.7577E+09	1.9177E+08	3.1101E+07	9.1153E+09

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

900000	1.0118E+07	1.7991E+07	3.8322E+08	3.5884E+07	4.4722E+08	2.3714E+09	2.7210E+09	1.7436E+08	2.9608E+07	9.9581E+09
1000000	9.9176E+06	1.7967E+07	3.7635E+08	3.4967E+07	4.3920E+08	2.4277E+09	2.6832E+09	1.6201E+08	2.8225E+07	1.0761E+10
1250000	9.5614E+06	1.8023E+07	3.6660E+08	3.3724E+07	4.2791E+08	2.5543E+09	2.5879E+09	1.4377E+08	2.6272E+07	1.2642E+10
1500000	9.4466E+06	1.7911E+07	3.5925E+08	3.2731E+07	4.1933E+08	2.6665E+09	2.4911E+09	1.3932E+08	2.4809E+07	1.4415E+10
1750000	9.1787E+06	1.7986E+07	3.5227E+08	3.1752E+07	4.1118E+08	2.7675E+09	2.3985E+09	1.4051E+08	2.3390E+07	1.6089E+10
2000000	9.0785E+06	1.7969E+07	3.4544E+08	3.0777E+07	4.0326E+08	2.8597E+09	2.3139E+09	1.4114E+08	2.2028E+07	1.7666E+10
2500000	8.8480E+06	1.7942E+07	3.3200E+08	2.8822E+07	3.8761E+08	3.0197E+09	2.1733E+09	1.3520E+08	1.9349E+07	2.0539E+10
3000000	8.6991E+06	1.7929E+07	3.2542E+08	2.7874E+07	3.7992E+08	3.1540E+09	2.0624E+09	1.2212E+08	1.8031E+07	2.3113E+10
3500000	8.6234E+06	1.7917E+07	3.2071E+08	2.7177E+07	3.7443E+08	3.2760E+09	1.9634E+09	1.0823E+08	1.7074E+07	2.5550E+10
4000000	8.5982E+06	1.7901E+07	3.1600E+08	2.6480E+07	3.6898E+08	3.3865E+09	1.8761E+09	9.2868E+07	1.6119E+07	2.7856E+10
5000000	8.4072E+06	1.7878E+07	3.0649E+08	2.5068E+07	3.5785E+08	3.5698E+09	1.7311E+09	6.6678E+07	1.4187E+07	3.2066E+10
6000000	8.2267E+06	1.7853E+07	2.9693E+08	2.3645E+07	3.4665E+08	3.7022E+09	1.6218E+09	5.0643E+07	1.2247E+07	3.5740E+10
7000000	8.1369E+06	1.7846E+07	2.9296E+08	2.3065E+07	3.4201E+08	3.7965E+09	1.5357E+09	4.6176E+07	1.1441E+07	3.9019E+10
8000000	7.9563E+06	1.7838E+07	2.8945E+08	2.2538E+07	3.3778E+08	3.8708E+09	1.4607E+09	4.9490E+07	1.0719E+07	4.2097E+10
9000050	7.9240E+06	1.7828E+07	2.8590E+08	2.2011E+07	3.3366E+08	3.9256E+09	1.3970E+09	5.9268E+07	1.0000E+07	4.4972E+10
10000050	7.8045E+06	1.7819E+07	2.8239E+08	2.1482E+07	3.2949E+08	3.9601E+09	1.3443E+09	7.6847E+07	9.2870E+06	4.7654E+10

COPATTA run I/O file: case4lca.dat/.lis

Reactor vessel energy not calculated until end of post-reflood (254 seconds for Case 4).

ECU operation begins at 60 seconds post-LOCA; containment spray flow begins at 33 seconds and reaches full flow at 60 seconds.

Sump recirculation begins at 2437 seconds.

lcarslts.wb2

TABLE 9-4C: SUMMARY OF HEAT SINK RESULTS FOR CASE 4

Time (sec)	Heat Sink Surface Temperatures (F)				Tag/Uch Cond. HTC (B/hr-ft2-F)
	HS #2 Liner Plate	HS #10 - Sec Shield Wall	HS #18 - CS Th <= 0.5"	HS #19 - Elec & Galv CS	
0	118.4	120.0	120.0	119.9	2.00
1	122.1	124.2	123.6	120.2	19.52
10	185.5	219.7	186.2	161.9	148.37
20	211.9	240.2	212.4	229.3	214.96
40	204.9	228.0	208.3	250.5	85.00
60	212.7	230.4	219.2	253.9	85.21
80	218.7	232.6	227.7	255.1	85.31
100	223.6	235.1	234.6	255.9	85.22
150	232.9	240.3	246.8	258.7	87.41
200	237.3	241.9	252.5	259.0	86.73
250	239.4	242.4	254.9	259.0	85.62
300	240.0	241.7	255.2	258.8	83.51
350	239.9	241.1	255.0	258.6	81.57
400	239.6	240.4	255.0	258.3	79.75
500	238.4	238.7	254.8	257.5	76.23
600	235.9	235.6	254.4	256.4	70.97
800	230.5	229.9	253.3	253.5	61.84
1000	225.5	224.8	251.7	249.8	56.71
1200	220.8	220.0	249.8	245.7	51.39
1300	218.3	217.4	248.7	243.5	48.67
1400	216.0	215.0	247.6	241.3	45.95
1600	211.8	210.9	245.1	236.7	42.90
1800	208.0	207.0	242.4	232.1	39.69
2000	204.1	203.0	239.6	227.6	36.60
2200	200.5	199.5	236.7	223.1	34.39
2400	197.2	196.1	233.6	218.7	32.08
2500	195.5	194.5	232.1	216.5	31.04
3000	195.8	196.7	225.4	208.5	33.83
3500	201.5	202.3	221.6	208.6	37.13
4000	205.5	206.2	219.5	212.4	39.66
6000	212.4	212.7	217.7	217.7	43.26
8000	213.3	213.5	218.1	218.3	43.21
10000	213.2	213.3	217.8	217.7	42.78
20000	207.4	207.5	211.8	210.8	37.67
30000	200.7	200.8	204.3	203.4	33.53
40000	193.3	193.4	196.4	195.5	28.86
50000	187.4	187.4	189.9	189.3	26.90
60000	182.0	182.2	184.0	183.4	24.78
70000	177.6	177.8	179.5	179.1	23.40
80000	174.0	174.1	175.7	175.3	22.36
90000	171.0	171.2	172.4	172.1	21.42
100000	168.7	168.9	169.8	169.6	20.75
200000	152.6	154.6	152.9	152.8	16.57
300000	142.0	146.2	142.0	142.0	14.44
400000	134.7	139.1	133.9	133.8	12.33
500000	128.8	132.8	127.6	127.6	10.41

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 198 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

600000	124.3	127.7	122.9	122.9	9.65
700000	120.7	123.6	119.6	119.6	9.06
800000	118.3	120.6	117.4	117.5	8.68
900000	116.9	118.9	116.6	116.6	8.50
1000000	116.1	117.7	115.9	116.0	8.31
2000000	112.7	113.6	113.4	113.4	7.77
3000000	111.4	112.4	112.3	112.3	7.59
4000000	110.8	111.7	111.6	111.7	7.54
5000000	110.1	111.0	110.9	111.0	7.44
6000000	109.4	110.2	110.2	110.2	7.34
7000000	109.1	109.9	109.8	109.9	7.29
8000000	108.8	109.6	109.6	109.6	7.18
9000050	108.6	109.3	109.3	109.3	7.16
10000050	108.3	109.0	109.0	109.0	7.09

COPATTA run I/O file: case4lca.dat/.lis

Maximum Tagami HTC = 252.2 Btu/hr-ft2-F @ 17 seconds

lcarslts.wb2

TABLE 9-5A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 5

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.55	1.85	89.9	206.4	0.0
0.2	17.39	2.69	105.0	210.9	0.0
0.3	18.17	3.47	116.7	214.0	0.0
0.4	18.91	4.21	126.3	216.4	0.0
0.5	19.65	4.95	135.3	218.3	0.0
0.6	20.34	5.64	142.6	219.9	0.0
0.7	21.00	6.30	148.1	220.0	0.0
0.8	21.66	6.96	153.7	220.3	0.0
0.9	22.30	7.60	158.1	220.9	0.0
1	22.93	8.23	162.2	220.6	0.0
2	28.80	14.10	193.0	222.4	0.0
3	33.51	18.81	210.2	225.3	0.0
4	36.98	22.28	220.5	228.1	0.0
5	39.84	25.14	227.9	231.3	0.0
6	42.44	27.74	234.0	234.2	0.0
7	44.75	30.05	239.1	236.8	0.0
8	46.91	32.21	243.5	238.8	0.0
9	48.80	34.10	247.2	240.9	0.0
10	50.58	35.88	250.5	242.4	0.0
11	52.23	37.53	253.5	243.4	0.0
12	53.45	38.75	255.5	244.2	0.0
13	54.42	39.72	257.3	245.0	0.0
14	54.93	40.23	258.0	245.7	0.0
15	55.28	40.58	258.5	246.5	0.0
16	55.44	40.74	258.8	247.0	0.0
17	55.45	40.75	258.9	247.3	0.0
18	55.34	40.64	258.7	247.6	0.0
19	55.10	40.40	258.2	247.8	0.0
20	54.86	40.16	257.8	247.9	0.0
22	54.66	39.96	258.3	247.6	0.0
24	54.46	39.76	258.5	240.2	0.0
26	54.33	39.63	258.8	234.0	0.0
28	54.21	39.51	259.1	228.8	0.0
30	54.13	39.43	259.5	224.5	0.0
32	54.08	39.38	260.1	220.8	0.0
34	54.07	39.37	260.7	217.5	0.0
36	54.06	39.36	261.1	214.7	0.0
38	54.07	39.37	261.5	212.2	0.0
40	54.08	39.38	261.7	210.0	0.0
42	54.07	39.37	261.7	208.1	0.0
44	54.05	39.35	261.4	206.3	0.0
46	54.01	39.31	260.7	204.7	0.0
48	53.97	39.27	260.0	203.2	0.0
50	53.92	39.22	259.1	201.9	0.0
52	53.87	39.17	258.2	200.6	0.0
54	53.82	39.12	257.2	199.5	0.0
56	53.77	39.07	256.1	198.5	0.0

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

58	53.78	39.08	256.1	197.6	0.0
60	53.79	39.09	256.1	196.7	0.0
62	53.78	39.08	256.1	195.9	0.0
64	53.78	39.08	256.1	195.2	0.0
66	53.78	39.08	256.1	194.6	0.0
68	53.77	39.07	256.0	194.0	0.0
70	53.77	39.07	256.1	193.4	0.0
72	53.78	39.08	256.0	192.9	0.0
74	53.78	39.08	256.1	192.4	0.0
76	53.79	39.09	256.1	192.0	0.0
78	53.80	39.10	256.1	191.5	0.0
80	53.81	39.11	256.1	191.1	0.0
82	53.82	39.12	256.1	190.8	0.0
84	53.82	39.12	256.1	190.5	0.0
86	53.82	39.12	256.0	190.2	0.0
88	53.78	39.08	255.9	190.0	0.0
90	53.77	39.07	255.9	189.8	0.0
92	53.99	39.29	256.3	189.8	0.0
94	54.17	39.47	256.4	190.0	0.0
96	54.40	39.70	256.7	190.2	0.0
98	54.62	39.92	257.0	190.4	0.0
100	54.83	40.13	257.2	190.7	0.0
105	55.12	40.42	257.7	191.3	0.0
110	55.35	40.65	257.9	191.9	0.0
115	55.56	40.86	258.3	192.6	0.0
120	55.72	41.02	258.5	193.2	0.0
125	55.86	41.16	258.8	194.0	0.0
130	55.96	41.26	259.0	194.7	0.0
135	56.03	41.33	259.0	195.4	0.0
140	56.08	41.38	259.0	196.1	0.0
145	56.08	41.38	259.0	196.9	0.0
150	56.07	41.37	259.0	197.5	0.0
155	56.04	41.34	258.9	198.2	0.0
160	55.95	41.25	258.8	198.8	0.0
165	55.87	41.17	258.7	199.4	0.0
170	55.75	41.05	258.5	200.0	0.0
175	55.57	40.87	258.2	199.1	287.1
180	55.29	40.59	257.7	200.6	284.8
185	55.01	40.31	257.3	201.6	282.6
190	54.75	40.05	256.9	202.5	280.5
195	54.48	39.78	256.4	203.4	278.4
200	54.22	39.52	255.9	204.2	276.4
205	54.02	39.32	255.5	205.0	274.4
210	53.79	39.09	255.1	205.8	272.5
215	53.61	38.91	254.9	206.5	270.7
220	53.38	38.68	254.5	207.2	269.0
225	53.16	38.46	254.1	207.8	267.3
230	52.95	38.25	253.7	208.4	265.7
235	52.75	38.05	253.5	209.0	264.1
240	52.55	37.85	253.1	209.6	262.6
245	52.35	37.65	252.8	210.1	261.1
250	52.15	37.45	252.4	210.6	259.7
255	51.96	37.26	252.1	211.1	258.3
260	51.78	37.08	251.7	211.5	256.9

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 201 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

265	51.59	36.89	251.4	212.0	255.6
270	51.41	36.71	251.1	212.4	254.4
275	51.24	36.54	250.7	212.8	253.2
280	51.07	36.37	250.4	213.2	252.0
285	50.89	36.19	250.1	213.5	250.9
290	50.73	36.03	249.8	213.9	249.8
295	50.56	35.86	249.5	214.2	248.7
300	50.40	35.70	249.2	214.5	247.6
310	50.08	35.38	248.6	215.1	245.6
320	49.77	35.07	248.0	215.6	243.8
330	49.48	34.78	247.5	216.1	242.0
340	49.21	34.51	246.9	216.5	240.3
350	48.90	34.20	246.3	216.9	238.7
360	48.62	33.92	245.8	217.2	237.1
370	48.40	33.70	245.3	217.5	235.7
380	48.18	33.48	244.9	217.8	234.3
390	47.92	33.22	244.4	218.0	232.9
400	47.66	32.96	243.9	218.3	231.6
420	47.18	32.48	242.9	218.6	227.5
440	46.69	31.99	241.9	218.8	217.5
460	46.22	31.52	241.0	218.7	208.9
480	45.77	31.07	240.0	218.4	201.6
500	45.34	30.64	239.1	218.0	195.4
520	44.91	30.21	238.2	217.4	190.1
540	44.50	29.80	237.3	216.8	185.4
560	44.11	29.41	236.4	216.2	181.5
580	43.72	29.02	235.6	215.4	178.0
600	43.34	28.64	234.7	214.7	175.0
650	42.51	27.81	232.8	212.7	169.1
700	41.65	26.95	230.7	210.7	164.8
750	40.84	26.14	228.7	208.6	161.4
800	40.07	25.37	226.8	206.7	158.7
850	39.35	24.65	224.9	204.8	156.5
900	38.66	23.96	223.1	203.0	154.6
950	38.01	23.31	221.3	201.3	152.9
1000	37.47	22.77	219.8	199.6	151.3
1050	36.87	22.17	218.1	198.0	149.9
1100	36.30	21.60	216.4	196.5	148.9
1150	35.76	21.06	214.8	195.0	148.1
1200	35.24	20.54	213.1	193.6	147.4
1220	35.04	20.34	212.5	193.1	147.2
1240	34.84	20.14	211.9	192.6	147.0
1260	34.64	19.94	211.2	192.0	146.7
1280	34.45	19.75	210.6	191.5	146.5
1300	34.26	19.56	210.0	191.0	146.3
1320	34.08	19.38	209.4	190.5	146.1
1340	33.90	19.20	208.8	190.1	145.9
1360	33.72	19.02	208.2	189.6	145.7
1380	33.56	18.86	207.6	189.2	147.7
1400	33.41	18.71	207.1	189.2	156.0
1450	32.99	18.29	205.7	189.1	175.6
1500	32.59	17.89	204.3	189.1	194.0
1550	32.21	17.51	203.0	189.1	211.1
1600	31.84	17.14	201.7	189.3	227.1

1650	31.48	16.78	200.4	189.5	241.9
1700	31.28	16.58	199.6	189.7	252.6
1750	31.51	16.81	200.5	189.9	253.0
1800	31.71	17.01	201.2	190.1	253.4
1850	31.90	17.20	202.0	190.2	253.7
1900	32.04	17.34	202.4	190.4	254.0
1950	32.18	17.48	202.9	190.6	254.2
2000	32.30	17.60	203.3	190.8	254.4
2050	32.43	17.73	203.9	191.0	254.6
2100	32.53	17.83	204.1	191.2	254.8
2150	32.62	17.92	204.5	191.4	255.0
2200	32.70	18.00	204.8	191.6	255.1
2250	32.77	18.07	205.1	191.8	255.3
2300	32.83	18.13	205.3	192.0	255.4
2350	32.88	18.18	205.3	192.2	255.5
2400	32.93	18.23	205.5	192.4	255.6
2420	32.94	18.24	205.6	192.5	255.6
2440	32.97	18.27	205.7	192.6	255.7
2460	32.97	18.27	205.7	192.7	255.7
2480	32.99	18.29	205.7	192.8	255.7
2500	33.02	18.32	205.9	192.9	255.7
2600	33.06	18.36	206.0	193.3	255.8
2700	33.10	18.40	206.1	193.7	255.9
2800	33.12	18.42	206.2	194.1	255.9
2900	33.12	18.42	206.2	194.4	255.9
3000	33.13	18.43	206.2	194.8	255.9
3100	33.13	18.43	206.2	195.2	255.9
3200	33.11	18.41	206.1	195.6	255.9
3300	33.08	18.38	206.0	196.0	255.9
3400	33.05	18.35	205.9	196.3	255.8
3500	32.99	18.29	205.7	196.7	255.7
3600	32.94	18.24	205.5	197.0	255.6
3700	32.91	18.21	205.4	197.4	255.5
3800	32.86	18.16	205.3	197.7	255.5
3900	32.81	18.11	205.1	198.0	255.4
4000	32.76	18.06	204.9	198.4	255.3
4500	32.51	17.81	204.1	199.9	254.9
5000	32.25	17.55	203.1	201.2	254.4
5500	31.97	17.27	202.1	202.4	253.9
6000	31.70	17.00	201.2	203.5	253.4
6500	31.44	16.74	200.2	204.4	252.9
7000	31.17	16.47	199.1	205.3	252.5
7500	30.89	16.19	198.1	206.0	252.0
8000	30.69	15.99	197.3	206.6	251.6
8500	30.50	15.80	196.6	207.1	251.2
9000	30.33	15.63	195.9	207.6	250.9
9500	30.18	15.48	195.3	207.9	250.7
10000	30.04	15.34	194.7	208.3	250.4
12500	29.40	14.70	192.1	209.2	249.1
15000	28.78	14.08	189.4	209.3	247.9
17500	28.14	13.44	186.6	208.9	246.5
20000	27.56	12.86	183.9	208.0	245.4
22500	27.12	12.42	181.7	207.0	244.4
25000	26.73	12.03	179.7	205.9	243.6

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 203 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

27500	26.34	11.64	177.7	204.8	242.8
30000	25.97	11.27	175.7	203.7	242.1
35000	25.21	10.51	171.5	201.5	240.5
40000	24.59	9.89	167.8	199.3	239.1
45000	24.11	9.41	164.7	197.3	237.9
50000	23.68	8.98	161.9	195.5	236.9
55000	23.29	8.59	159.2	193.9	235.9
60000	22.97	8.27	156.9	192.5	235.2
65000	22.68	7.98	154.7	191.2	234.5
70000	22.41	7.71	152.6	190.0	233.8
75000	22.19	7.49	150.8	189.0	233.3
80000	22.00	7.30	149.3	188.0	232.8
85000	21.82	7.12	147.8	187.2	232.4
90000	21.66	6.96	146.5	186.4	232.0
95000	21.53	6.83	145.3	185.8	231.7
100000	21.42	6.72	144.3	185.2	231.4
125000	20.95	6.25	140.0	182.9	230.3
150000	20.54	5.84	135.9	181.0	229.3
175000	20.15	5.45	131.9	179.2	228.3
200000	19.86	5.16	129.6	177.9	227.6
225000	19.68	4.98	127.9	176.8	227.0
250000	19.46	4.76	124.9	175.3	226.2
275000	19.26	4.56	122.5	174.1	225.6
300000	19.12	4.42	120.8	173.3	225.1
400000	18.96	4.26	118.6	165.7	211.7
500000	18.85	4.15	117.0	159.7	201.7
600000	18.79	4.09	116.0	155.6	194.6
700000	18.67	3.97	113.4	151.9	188.0
800000	18.66	3.96	114.2	149.8	184.4
900000	18.60	3.90	112.4	147.8	180.9
1000000	18.60	3.90	113.3	146.0	177.6
1250000	18.60	3.90	114.0	143.4	173.1
1500000	18.56	3.86	113.6	141.4	169.5
1750000	18.54	3.84	113.2	139.5	166.0
2000000	18.52	3.82	112.9	137.5	162.4
2500000	18.37	3.67	109.1	133.5	155.2
3000000	18.43	3.73	111.6	131.6	151.8
3500000	18.41	3.71	111.3	130.2	149.3
4000000	18.31	3.61	108.2	128.9	146.8
5000000	18.36	3.66	110.6	126.2	141.9
6000000	18.32	3.62	110.0	123.4	136.9
7000000	18.31	3.61	109.7	122.2	134.8
8000000	18.29	3.59	109.4	121.2	133.0
9000050	18.27	3.57	109.2	120.2	131.1
10000050	18.26	3.56	108.9	119.1	129.2

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (174 seconds for Case 5)
COPATTA run I/O file: case5lca.dat/.lis

lcarslts.wb2

TABLE 9-6A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 6

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	16.55	1.85	89.9	206.4	0.0
0.2	17.39	2.69	105.0	210.9	0.0
0.3	18.17	3.47	116.7	214.0	0.0
0.4	18.91	4.21	126.3	216.4	0.0
0.5	19.65	4.95	135.3	218.3	0.0
0.6	20.34	5.64	142.6	219.9	0.0
0.7	21.00	6.30	148.1	220.0	0.0
0.8	21.66	6.96	153.7	220.3	0.0
0.9	22.30	7.60	158.1	220.9	0.0
1	22.93	8.23	162.2	220.6	0.0
2	28.80	14.10	193.0	222.4	0.0
3	33.51	18.81	210.2	225.3	0.0
4	36.98	22.28	220.5	228.1	0.0
5	39.84	25.14	227.9	231.3	0.0
6	42.44	27.74	234.0	234.2	0.0
7	44.75	30.05	239.1	236.8	0.0
8	46.91	32.21	243.5	238.8	0.0
9	48.80	34.10	247.2	240.9	0.0
10	50.58	35.88	250.5	242.4	0.0
11	52.23	37.53	253.5	243.4	0.0
12	53.45	38.75	255.5	244.2	0.0
13	54.42	39.72	257.3	245.0	0.0
14	54.93	40.23	258.0	245.7	0.0
15	55.28	40.58	258.5	246.5	0.0
16	55.44	40.74	258.8	247.0	0.0
17	55.45	40.75	258.9	247.3	0.0
18	55.34	40.64	258.7	247.6	0.0
19	55.10	40.40	258.2	247.8	0.0
20	54.86	40.16	257.8	247.9	0.0
22	54.66	39.96	258.3	247.6	0.0
24	54.46	39.76	258.5	240.2	0.0
26	54.33	39.63	258.8	234.0	0.0
28	54.21	39.51	259.1	228.8	0.0
30	54.13	39.43	259.5	224.5	0.0
32	54.08	39.38	260.1	220.8	0.0
34	54.06	39.36	260.6	217.5	0.0
36	54.04	39.34	260.8	214.7	0.0
38	54.03	39.33	260.8	212.2	0.0
40	53.99	39.29	260.4	210.0	0.0
42	53.94	39.24	259.5	208.1	0.0
44	53.84	39.14	258.1	206.3	0.0
46	53.73	39.03	256.1	204.7	0.0
48	53.71	39.01	256.0	203.2	0.0
50	53.72	39.02	256.0	201.9	0.0
52	53.72	39.02	256.0	200.7	0.0
54	53.72	39.02	256.0	199.6	0.0
56	53.73	39.03	256.0	198.6	0.0

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇓

58	53.72	39.02	255.9	197.7	0.0
60	53.71	39.01	255.8	196.9	0.0
62	53.66	38.96	255.8	196.2	0.0
64	53.65	38.95	255.7	195.5	0.0
66	53.65	38.95	255.7	194.9	0.0
68	53.64	38.94	255.7	194.4	0.0
70	53.64	38.94	255.7	193.8	0.0
72	53.63	38.93	255.7	193.3	0.0
74	53.63	38.93	255.7	192.9	0.0
76	53.64	38.94	255.7	192.5	0.0
78	53.64	38.94	255.7	192.1	0.0
80	53.64	38.94	255.7	191.8	0.0
82	53.65	38.95	255.7	191.4	0.0
84	53.65	38.95	255.7	191.2	0.0
86	53.65	38.95	255.7	190.9	0.0
88	53.64	38.94	255.7	190.7	0.0
90	53.63	38.93	255.7	190.6	0.0
92	53.84	39.14	255.9	190.6	0.0
94	54.02	39.32	256.0	190.9	0.0
96	54.24	39.54	256.3	191.1	0.0
98	54.45	39.75	256.5	191.4	0.0
100	54.66	39.96	256.7	191.6	0.0
105	54.92	40.22	257.1	192.3	0.0
110	55.15	40.45	257.5	193.0	0.0
115	55.34	40.64	257.8	193.7	0.0
120	55.50	40.80	258.1	194.5	0.0
125	55.62	40.92	258.3	195.3	0.0
130	55.70	41.00	258.4	196.0	0.0
135	55.77	41.07	258.5	196.8	0.0
140	55.80	41.10	258.5	197.6	0.0
145	55.80	41.10	258.5	198.4	0.0
150	55.77	41.07	258.5	199.1	0.0
155	55.73	41.03	258.4	199.8	0.0
160	55.62	40.92	258.2	200.5	0.0
165	55.53	40.83	258.1	201.1	0.0
170	55.40	40.70	257.9	201.7	0.0
175	55.21	40.51	257.6	200.9	286.7
180	54.92	40.22	257.2	202.4	284.5
185	54.63	39.93	256.7	203.4	282.3
190	54.34	39.64	256.1	204.3	280.2
195	54.06	39.36	255.6	205.2	278.1
200	53.80	39.10	255.2	206.0	276.1
205	53.57	38.87	254.8	206.8	274.2
210	53.39	38.69	254.5	207.6	272.3
215	53.15	38.45	254.1	208.3	270.6
220	52.92	38.22	253.8	208.9	268.8
225	52.69	37.99	253.4	209.6	267.2
230	52.46	37.76	253.0	210.2	265.6
235	52.24	37.54	252.5	210.8	264.0
240	52.03	37.33	252.2	211.3	262.5
245	51.82	37.12	251.8	211.8	261.0
250	51.61	36.91	251.4	212.3	259.6
255	51.41	36.71	251.0	212.8	258.3
260	51.21	36.51	250.7	213.2	256.9

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 206 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

265	51.02	36.32	250.3	213.7	255.7
270	50.83	36.13	250.0	214.1	254.4
275	50.65	35.95	249.6	214.4	253.2
280	50.47	35.77	249.3	214.8	252.1
285	50.29	35.59	249.0	215.1	250.9
290	50.11	35.41	248.6	215.5	249.9
295	49.94	35.24	248.3	215.8	248.8
300	49.77	35.07	248.0	216.1	247.8
310	49.44	34.74	247.4	216.6	245.8
320	49.11	34.41	246.7	217.1	243.9
330	48.79	34.09	246.1	217.5	242.1
340	48.49	33.79	245.5	217.9	240.5
350	48.27	33.57	245.1	218.3	238.9
360	47.98	33.28	244.5	218.6	237.3
370	47.69	32.99	244.0	218.9	235.9
380	47.42	32.72	243.5	219.1	234.5
390	47.15	32.45	242.9	219.4	233.2
400	46.88	32.18	242.3	219.6	231.9
420	46.36	31.66	241.2	219.9	227.8
440	45.85	31.15	240.2	220.0	217.8
460	45.35	30.65	239.1	219.8	209.3
480	44.88	30.18	238.1	219.5	202.0
500	44.42	29.72	237.1	219.1	195.8
520	43.97	29.27	236.1	218.6	190.5
540	43.54	28.84	235.1	218.0	185.9
560	43.11	28.41	234.2	217.3	182.0
580	42.78	28.08	233.4	216.6	178.5
600	42.38	27.68	232.5	215.8	175.6
650	41.41	26.71	230.2	213.9	169.7
700	40.50	25.80	227.9	211.9	165.4
750	39.65	24.95	225.7	209.9	162.1
800	38.85	24.15	223.6	208.0	159.5
850	38.10	23.40	221.6	206.2	157.3
900	37.45	22.75	219.8	204.4	155.4
950	36.76	22.06	217.8	202.8	153.7
1000	36.11	21.41	215.8	201.1	152.2
1050	35.49	20.79	213.9	199.6	150.9
1100	34.89	20.19	212.1	198.1	149.8
1150	34.33	19.63	210.2	196.7	149.0
1200	33.79	19.09	208.5	195.3	148.2
1220	33.59	18.89	207.7	194.8	148.0
1240	33.42	18.72	207.2	194.4	150.0
1260	33.25	18.55	206.6	194.3	158.6
1280	33.08	18.38	206.0	194.2	167.0
1300	32.91	18.21	205.5	194.2	175.1
1320	32.75	18.05	204.9	194.1	183.1
1340	32.58	17.88	204.3	194.1	190.8
1360	32.42	17.72	203.7	194.1	198.3
1380	32.26	17.56	203.2	194.1	205.6
1400	32.11	17.41	202.6	194.1	212.6
1450	31.73	17.03	201.3	194.1	229.5
1500	31.37	16.67	199.9	194.3	245.1
1550	31.33	16.63	199.7	194.4	252.7
1600	31.58	16.88	200.7	194.5	253.1

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

1650	31.79	17.09	201.5	194.6	253.5
1700	31.98	17.28	202.2	194.7	253.9
1750	32.15	17.45	202.8	194.9	254.2
1800	32.30	17.60	203.3	195.0	254.4
1850	32.43	17.73	203.8	195.1	254.7
1900	32.55	17.85	204.2	195.3	254.9
1950	32.65	17.95	204.6	195.4	255.1
2000	32.75	18.05	204.9	195.5	255.2
2050	32.84	18.14	205.2	195.7	255.4
2100	32.92	18.22	205.5	195.8	255.5
2150	32.99	18.29	205.7	196.0	255.7
2200	33.05	18.35	205.9	196.1	255.8
2250	33.10	18.40	206.1	196.3	255.9
2300	33.15	18.45	206.3	196.4	256.0
2350	33.19	18.49	206.4	196.6	256.0
2400	33.22	18.52	206.5	196.7	256.1
2420	33.23	18.53	206.5	196.8	256.1
2440	33.25	18.55	206.6	196.8	256.1
2460	33.26	18.56	206.6	196.9	256.2
2480	33.26	18.56	206.6	196.9	256.2
2500	33.27	18.57	206.7	197.0	256.2
2600	33.31	18.61	206.8	197.3	256.3
2700	33.32	18.62	206.8	197.6	256.3
2800	33.32	18.62	206.8	197.9	256.3
2900	33.32	18.62	206.8	198.1	256.3
3000	33.31	18.61	206.8	198.4	256.3
3100	33.29	18.59	206.7	198.7	256.2
3200	33.25	18.55	206.6	198.9	256.2
3300	33.21	18.51	206.5	199.2	256.1
3400	33.17	18.47	206.3	199.4	256.0
3500	33.12	18.42	206.1	199.7	255.9
3600	33.06	18.36	205.9	199.9	255.8
3700	33.00	18.30	205.7	200.1	255.7
3800	32.93	18.23	205.5	200.3	255.6
3900	32.87	18.17	205.3	200.5	255.5
4000	32.81	18.11	205.1	200.7	255.4
4500	32.51	17.81	204.0	201.6	254.9
5000	32.19	17.49	202.9	202.4	254.3
5500	31.87	17.17	201.8	202.9	253.7
6000	31.55	16.85	200.6	203.4	253.1
6500	31.23	16.53	199.4	203.7	252.6
7000	30.90	16.20	198.1	203.9	252.0
7500	30.59	15.89	196.9	204.0	251.4
8000	30.30	15.60	195.8	204.0	250.9
8500	30.06	15.36	194.8	203.9	250.5
9000	29.85	15.15	193.9	203.8	250.0
9500	29.65	14.95	193.1	203.6	249.6
10000	29.46	14.76	192.3	203.4	249.2
12500	28.59	13.89	188.6	201.9	247.5
15000	27.74	13.04	184.7	200.0	245.7
17500	26.91	12.21	180.7	197.8	244.0
20000	26.25	11.55	177.3	195.5	242.7
22500	25.72	11.02	174.4	193.4	241.6
25000	25.22	10.52	171.5	191.4	240.5

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

27500	24.79	10.09	169.0	189.5	239.6
30000	24.40	9.70	166.6	187.8	238.6
35000	23.54	8.84	160.9	184.5	236.6
40000	22.81	8.11	155.7	181.2	234.8
45000	22.27	7.57	151.6	178.3	233.5
50000	21.82	7.12	147.9	175.8	232.4
55000	21.42	6.72	144.4	173.7	231.4
60000	21.12	6.42	141.6	171.8	230.7
65000	20.86	6.16	139.1	170.2	230.1
70000	20.63	5.93	136.9	168.8	229.5
75000	20.43	5.73	134.8	167.6	229.0
80000	20.25	5.55	133.0	166.5	228.6
85000	20.10	5.40	131.3	165.5	228.2
90000	19.97	5.27	129.8	164.6	227.9
95000	19.86	5.16	128.6	163.9	227.5
100000	19.77	5.07	127.5	163.2	227.3
125000	19.37	4.67	122.7	160.5	226.1
150000	19.03	4.33	119.4	158.3	224.9
175000	18.87	4.17	116.2	155.3	218.2
200000	18.84	4.14	117.3	152.7	213.2
225000	18.77	4.07	115.9	150.6	208.6
250000	18.68	3.98	113.6	148.6	204.1
275000	18.72	4.02	115.7	146.9	200.5
300000	18.69	3.99	115.1	145.6	197.6
400000	18.58	3.88	113.8	140.8	186.8
500000	18.53	3.83	113.0	137.5	179.5
600000	18.41	3.71	109.6	135.2	174.2
700000	18.44	3.74	111.7	132.9	169.0
800000	18.42	3.72	111.5	131.7	166.3
900000	18.32	3.62	108.3	130.5	163.6
1000000	18.38	3.68	110.9	129.4	161.0
1250000	18.35	3.65	110.5	127.8	157.5
1500000	18.34	3.64	110.2	126.6	154.7
1750000	18.31	3.61	109.9	125.4	151.9
2000000	18.29	3.59	109.6	124.2	149.1
2500000	18.26	3.56	109.0	121.8	143.5
3000000	18.23	3.53	108.8	120.6	140.8
3500000	18.23	3.53	108.5	119.8	138.8
4000000	18.22	3.52	108.3	118.9	136.8
5000000	18.21	3.51	107.9	117.2	132.9
6000000	18.19	3.49	107.5	115.4	128.9
7000000	18.19	3.49	107.3	114.7	127.3
8000000	18.18	3.48	107.1	114.1	125.8
9000050	18.18	3.48	107.0	113.4	124.4
10000050	18.17	3.47	106.8	112.8	122.9

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of post-reflood (174 seconds for Case 6)
COPATTA run I/O file: case6lca.dat/.lis

tcarslts.wb2

TABLE 9-7A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 7

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	17.83	3.13	111.8	216.1	0.0
0.2	19.48	4.78	133.1	219.3	0.0
0.3	20.85	6.15	146.1	217.7	0.0
0.4	22.07	7.37	156.0	218.1	0.0
0.5	23.19	8.49	163.9	218.2	0.0
0.6	24.24	9.54	170.5	218.8	0.0
0.7	25.24	10.54	176.2	218.6	0.0
0.8	26.18	11.48	181.1	218.1	0.0
0.9	27.06	12.36	185.4	218.9	0.0
1	27.88	13.18	189.1	218.9	0.0
2	34.97	20.27	214.7	223.7	0.0
3	40.89	26.19	230.5	230.9	0.0
4	45.80	31.10	241.3	236.7	0.0
5	49.92	35.22	249.3	241.4	0.0
6	53.27	38.57	255.2	245.3	0.0
7	56.21	41.51	260.1	246.9	0.0
8	58.16	43.46	263.3	247.6	0.0
9	59.33	44.63	265.1	248.0	0.0
10	60.03	45.33	265.9	248.3	0.0
11	60.42	45.72	266.7	248.6	0.0
12	60.27	45.57	267.4	248.7	0.0
13	60.01	45.31	266.8	248.9	292.7
14	59.81	45.11	266.2	249.0	292.5
15	59.66	44.96	265.7	249.1	292.3
16	59.53	44.83	265.4	249.2	292.2
17	59.42	44.72	265.1	249.3	292.0
18	59.34	44.64	264.8	249.4	291.9
19	59.27	44.57	264.7	249.5	291.9
20	59.23	44.53	264.6	249.5	291.8
22	59.16	44.46	264.6	249.7	291.7
24	59.13	44.43	264.5	249.8	291.7
26	59.08	44.38	264.4	249.9	291.6
28	59.01	44.31	264.3	250.0	291.6
30	58.97	44.27	264.2	250.1	291.5
32	58.86	44.16	264.0	250.1	291.4
34	58.75	44.05	263.9	250.2	291.2
36	58.65	43.95	263.7	250.3	291.1
38	58.56	43.86	263.6	250.3	291.0
40	58.43	43.73	263.4	250.4	290.9
42	58.34	43.64	263.3	250.4	290.8
44	58.34	43.64	263.5	250.5	290.8
46	58.23	43.53	263.3	250.5	290.7
48	58.14	43.44	263.1	250.6	290.6
50	58.09	43.39	262.9	250.6	290.4
52	57.96	43.26	262.8	250.7	290.3
54	57.90	43.20	262.6	250.7	290.3
56	57.76	43.06	262.5	250.8	290.1

58	57.68	42.98	262.3	250.8	290.0
60	57.57	42.87	262.1	250.9	289.9
62	57.44	42.74	261.9	250.9	289.7
64	57.33	42.63	261.7	251.0	289.6
66	57.21	42.51	261.6	251.2	289.5
68	57.10	42.40	261.4	251.4	289.3
70	56.99	42.29	261.2	251.6	289.2
72	56.88	42.18	261.0	251.8	289.1
74	56.78	42.08	260.9	252.0	288.9
76	56.68	41.98	260.7	252.1	288.8
78	56.58	41.88	260.6	252.3	288.7
80	56.48	41.78	260.4	252.5	288.6
82	56.39	41.69	260.3	252.6	288.5
84	56.30	41.60	260.1	252.8	288.4
86	56.21	41.51	260.0	253.0	288.3
88	56.12	41.42	259.8	253.1	288.2
90	56.04	41.34	259.7	253.3	288.1
92	56.04	41.34	259.6	253.4	288.1
94	56.04	41.34	259.4	253.6	288.1
96	56.04	41.34	259.3	253.7	288.1
98	56.05	41.35	259.2	253.9	288.1
100	56.05	41.35	259.1	254.0	288.1
105	55.88	41.18	258.8	254.3	287.9
110	55.71	41.01	258.5	254.7	287.7
115	55.56	40.86	258.3	255.0	287.5
120	55.42	40.72	258.0	255.3	287.4
125	55.28	40.58	257.8	255.5	287.2
130	55.15	40.45	257.6	255.8	287.0
135	55.03	40.33	257.4	256.1	286.9
140	54.92	40.22	257.2	256.3	286.8
145	54.81	40.11	257.0	256.6	286.6
150	54.69	39.99	256.8	256.8	286.5
155	54.50	39.80	256.5	257.0	286.3
160	54.31	39.61	256.2	257.3	286.1
165	54.12	39.42	255.9	257.5	285.9
170	53.94	39.24	255.6	257.7	285.7
175	53.78	39.08	255.3	257.9	285.4
180	53.61	38.91	255.0	258.1	285.2
185	53.49	38.79	254.8	258.3	285.2
190	53.36	38.66	254.6	258.5	284.9
195	53.14	38.44	254.2	258.7	284.4
200	52.92	38.22	253.8	258.9	283.7
205	52.72	38.02	253.5	259.1	282.9
210	52.51	37.81	253.2	259.2	282.2
215	52.31	37.61	252.8	259.4	281.5
220	52.12	37.42	252.5	259.5	280.8
225	51.93	37.23	252.1	259.6	280.0
230	51.74	37.04	251.8	259.7	279.3
235	51.56	36.86	251.4	259.8	278.6
240	51.38	36.68	251.1	259.9	277.9
245	51.20	36.50	250.8	260.0	277.2
250	51.03	36.33	250.5	260.0	276.5
255	50.86	36.16	250.2	260.1	275.8
260	50.70	36.00	249.9	260.1	275.1

265	50.53	35.83	249.6	260.2	274.3
270	50.37	35.67	249.3	260.2	273.6
275	50.22	35.52	249.0	260.2	272.9
280	50.06	35.36	248.7	260.3	272.2
285	49.91	35.21	248.4	260.3	271.5
290	49.76	35.06	248.1	260.3	270.8
295	49.61	34.91	247.8	260.3	270.1
300	49.47	34.77	247.6	260.3	269.4
310	49.19	34.49	247.1	260.3	268.0
320	48.94	34.24	246.5	260.2	266.6
330	48.68	33.98	246.0	260.1	265.2
340	48.42	33.72	245.5	260.0	263.8
350	48.18	33.48	245.2	259.9	262.4
360	47.96	33.26	244.7	259.8	261.0
370	47.71	33.01	244.2	259.7	259.6
380	47.48	32.78	243.7	259.5	258.2
390	47.25	32.55	243.3	259.4	256.8
400	47.01	32.31	242.8	259.2	255.4
420	46.57	31.87	241.9	258.8	252.7
440	46.14	31.44	241.0	258.3	250.2
460	45.74	31.04	240.2	257.9	247.8
480	45.34	30.64	239.3	257.4	245.5
500	44.96	30.26	238.5	256.8	243.3
520	44.59	29.89	237.7	256.3	241.2
540	44.23	29.53	236.9	255.7	239.1
560	43.87	29.17	236.2	255.1	237.2
580	43.53	28.83	235.4	254.6	235.4
600	43.20	28.50	234.6	254.0	233.6
650	42.47	27.77	233.0	252.4	229.4
700	41.71	27.01	231.2	250.9	225.6
750	40.99	26.29	229.4	249.4	222.0
800	40.30	25.60	227.7	247.8	218.6
850	39.65	24.95	226.1	246.3	215.4
900	39.04	24.34	224.5	244.8	212.3
950	38.46	23.76	223.0	243.3	209.4
1000	37.90	23.20	221.4	241.8	206.5
1050	37.44	22.74	220.1	240.3	203.9
1100	36.92	22.22	218.7	238.9	201.6
1150	36.43	21.73	217.3	237.5	199.6
1200	35.96	21.26	215.9	236.1	197.9
1220	35.77	21.07	215.3	235.6	197.2
1240	35.59	20.89	214.7	235.1	196.6
1260	35.41	20.71	214.2	234.6	196.0
1280	35.23	20.53	213.7	234.0	195.4
1300	35.06	20.36	213.1	233.5	194.9
1320	34.89	20.19	212.6	233.0	194.4
1340	34.72	20.02	212.0	232.5	193.8
1360	34.55	19.85	211.5	232.0	193.3
1380	34.39	19.69	211.0	231.6	192.9
1400	34.23	19.53	210.5	231.1	192.4
1450	33.84	19.14	209.2	229.9	191.3
1500	33.46	18.76	207.9	228.8	190.2
1550	33.13	18.43	206.8	227.7	189.2
1600	32.78	18.08	205.6	226.6	188.2

1650	32.44	17.74	204.4	225.6	187.3
1700	32.11	17.41	203.2	224.6	186.4
1750	31.79	17.09	202.0	223.6	185.5
1800	31.48	16.78	200.8	222.6	184.6
1850	31.18	16.48	199.7	221.7	183.8
1900	30.89	16.19	198.6	220.8	183.0
1950	30.64	15.94	197.5	219.9	182.3
2000	30.37	15.67	196.5	219.0	181.6
2050	30.10	15.40	195.4	218.2	180.9
2100	29.85	15.15	194.3	217.4	180.3
2150	29.60	14.90	193.3	216.6	179.6
2200	29.37	14.67	192.3	215.8	179.0
2250	29.14	14.44	191.3	215.0	178.4
2300	28.91	14.21	190.3	214.3	177.9
2350	28.70	14.00	189.3	213.6	177.3
2400	28.49	13.79	188.3	212.9	176.7
2420	28.42	13.72	188.0	212.8	183.3
2440	28.38	13.68	188.3	212.7	189.7
2460	28.31	13.61	187.6	212.6	196.1
2480	28.24	13.54	187.2	212.5	202.4
2500	28.18	13.48	186.9	212.4	208.6
2600	27.87	13.17	185.5	212.1	238.2
2700	28.40	13.70	187.9	211.9	246.9
2800	29.10	14.40	191.0	211.6	248.3
2900	29.70	15.00	193.5	211.4	249.6
3000	30.24	15.54	195.7	211.2	250.7
3100	30.71	16.01	197.6	211.1	251.5
3200	31.10	16.40	199.1	210.9	252.2
3300	31.46	16.76	200.4	210.8	252.9
3400	31.78	17.08	201.6	210.6	253.5
3500	32.06	17.36	202.6	210.5	254.0
3600	32.33	17.63	203.6	210.4	254.5
3700	32.57	17.87	204.4	210.3	254.9
3800	32.79	18.09	205.2	210.3	255.3
3900	33.00	18.30	205.9	210.2	255.7
4000	33.19	18.49	206.5	210.1	256.0
4500	33.94	19.24	209.0	209.9	257.3
5000	34.48	19.78	210.8	209.9	258.3
5500	34.80	20.10	211.8	209.9	259.0
6000	35.01	20.31	212.4	210.0	259.3
6500	35.13	20.43	212.8	210.1	259.5
7000	35.17	20.47	212.9	210.3	259.6
7500	35.30	20.60	213.3	210.1	259.8
8000	35.50	20.80	213.9	209.7	260.1
8500	35.65	20.95	214.4	209.3	260.3
9000	35.77	21.07	214.7	209.1	260.5
9500	35.85	21.15	215.0	208.8	260.7
10000	35.92	21.22	215.2	208.6	260.8
12500	35.96	21.26	215.3	207.7	260.8
15000	35.61	20.91	214.3	207.0	260.3
17500	35.03	20.33	212.5	206.2	259.4
20000	34.43	19.73	210.6	205.3	258.3
22500	33.94	19.24	209.0	204.3	257.4
25000	33.47	18.77	207.5	203.2	256.6

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 213 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

27500	32.99	18.29	205.9	202.1	255.7
30000	32.48	17.78	204.1	200.9	254.8
35000	31.45	16.75	200.4	198.5	253.0
40000	30.58	15.88	197.0	195.9	251.4
45000	29.86	15.16	194.2	193.5	250.1
50000	29.24	14.54	191.6	191.2	248.8
55000	28.66	13.96	189.1	189.1	247.6
60000	28.18	13.48	187.0	187.1	246.6
65000	27.76	13.06	185.0	185.4	245.7
70000	27.36	12.66	183.1	183.8	244.9
75000	27.02	12.32	181.4	182.3	244.2
80000	26.75	12.05	180.0	181.0	243.7
85000	26.49	11.79	178.7	179.8	243.1
90000	26.26	11.56	177.6	178.8	242.7
95000	26.08	11.38	176.6	177.8	242.3
100000	25.92	11.22	175.7	177.0	242.0
125000	25.21	10.51	171.7	173.9	240.5
150000	24.59	9.89	168.1	171.3	239.1
175000	24.03	9.33	164.5	168.8	237.7
200000	23.60	8.90	161.6	166.7	236.7
225000	23.23	8.53	159.1	164.9	235.8
250000	22.88	8.18	156.5	163.2	234.9
275000	22.57	7.87	154.2	161.6	234.2
300000	22.34	7.64	152.4	160.3	233.6
400000	21.53	6.83	145.6	155.9	231.7
500000	20.95	6.25	140.4	152.4	230.3
600000	20.56	5.86	136.6	150.0	229.3
700000	20.18	5.48	132.6	147.6	228.4
800000	19.99	5.29	130.5	146.1	227.9
900000	19.80	5.10	128.4	144.8	227.4
1000000	19.62	4.92	126.2	143.5	226.8
1250000	19.35	4.65	123.0	141.5	226.0
1500000	19.16	4.46	120.7	140.0	225.5
1750000	18.98	4.28	118.3	138.6	224.9
2000000	18.80	4.10	115.9	137.1	224.4
2500000	18.51	3.81	113.2	134.7	221.3
3000000	18.45	3.75	112.6	132.6	213.1
3500000	18.35	3.65	109.3	131.1	207.2
4000000	18.32	3.62	108.9	129.6	201.3
5000000	18.27	3.57	108.1	126.7	189.4
6000000	18.30	3.60	110.3	123.7	177.6
7000000	18.28	3.58	109.9	122.5	172.8
8000000	18.25	3.55	109.6	121.4	168.4
9000050	18.23	3.53	109.3	120.3	164.0
10000050	18.21	3.51	109.0	119.2	159.7

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of initial blowdown (12.2 seconds for Case 7)

COPATTA run I/O file: case7lca.dat/.lis

lcarslts.wb2

TABLE 9-7B: SUMMARY OF CONTAINMENT ENERGY AND CONTAINMENT HEAT REMOVAL HEAT TRANSFER FOR CASE 7

Time (seconds)	Steam Energy (Btu)	Air Energy (Btu)	Sump Energy (Btu)	Rx Vessel Energy (Btu)	Total Energy (Btu)	Integrated ECU Energy (Btu)	Integrated CS Ht Trans (Btu)	Heat Sink Net HT (Btu)	SDHX Duty (Btu/hr)	Integrated SDHX Ht Trans (Btu)
0.0	5.9260E+05	1.7809E+07	0.0000E+00	0	1.8405E+07	0	0	0.0000E+00	0	0
0.1	9.5632E+06	1.7558E+07	1.2957E+06	0	2.8417E+07	0	0	-3.0551E+02	0	0
0.2	1.6488E+07	1.8211E+07	2.7263E+06	0	3.7425E+07	0	0	-2.4025E+01	0	0
0.3	2.2946E+07	1.8613E+07	3.9125E+06	0	4.5471E+07	0	0	3.7755E+03	0	0
0.4	2.8931E+07	1.8916E+07	5.0427E+06	0	5.2890E+07	0	0	1.1391E+04	0	0
0.5	3.4605E+07	1.9159E+07	6.1053E+06	0	5.9868E+07	0	0	2.2667E+04	0	0
0.6	4.0017E+07	1.9361E+07	7.1393E+06	0	6.6518E+07	0	0	3.7305E+04	0	0
0.7	4.5168E+07	1.9577E+07	8.0926E+06	0	7.2837E+07	0	0	5.5108E+04	0	0
0.8	5.0191E+07	1.9686E+07	8.9482E+06	0	7.8826E+07	0	0	7.5858E+04	0	0
0.9	5.4825E+07	1.9817E+07	9.8377E+06	0	8.4480E+07	0	0	1.0049E+05	0	0
1	5.9242E+07	1.9932E+07	1.0624E+07	0	8.9797E+07	0	0	1.2949E+05	0	0
2	9.7443E+07	2.0720E+07	1.8615E+07	0	1.3678E+08	0	0	6.6454E+05	0	0
3	1.2962E+08	2.1193E+07	2.7028E+07	0	1.7784E+08	0	0	1.6375E+06	0	0
4	1.5648E+08	2.1542E+07	3.4460E+07	0	2.1248E+08	0	0	3.0095E+06	0	0
5	1.7905E+08	2.1775E+07	4.1171E+07	0	2.4200E+08	0	0	4.7222E+06	0	0
6	1.9750E+08	2.1962E+07	4.6941E+07	0	2.6640E+08	0	0	6.7138E+06	0	0
7	2.1320E+08	2.1890E+07	4.9895E+07	0	2.8498E+08	0	0	8.9165E+06	0	0
8	2.2375E+08	2.2059E+07	5.1350E+07	0	2.9716E+08	0	0	1.1264E+07	0	0
9	2.3036E+08	2.2244E+07	5.2332E+07	0	3.0494E+08	0	0	1.3683E+07	0	0
10	2.3415E+08	2.2264E+07	5.3073E+07	0	3.0949E+08	0	0	1.6112E+07	0	0
11	2.3616E+08	2.2316E+07	5.3819E+07	0	3.1230E+08	0	0	1.8511E+07	0	0
12	2.3495E+08	2.2337E+07	5.4377E+07	0	3.1167E+08	0	0	2.0740E+07	0	0
13	2.3366E+08	2.2318E+07	5.4876E+07	4.5016E+07	3.5588E+08	0	0	2.2735E+07	0	0
14	2.3274E+08	2.2300E+07	5.5328E+07	4.4899E+07	3.5527E+08	0	0	2.4544E+07	0	0
15	2.3199E+08	2.2286E+07	5.5741E+07	4.4793E+07	3.5481E+08	0	0	2.6199E+07	0	0
16	2.3137E+08	2.2274E+07	5.6122E+07	4.4699E+07	3.5446E+08	0	0	2.7726E+07	0	0
17	2.3086E+08	2.2265E+07	5.6475E+07	4.4615E+07	3.5421E+08	0	0	2.9143E+07	0	0
18	2.3044E+08	2.2258E+07	5.6805E+07	4.4539E+07	3.5405E+08	0	0	3.0466E+07	0	0
19	2.3011E+08	2.2260E+07	5.7114E+07	4.4473E+07	3.5395E+08	0	0	3.1706E+07	0	0
20	2.2984E+08	2.2258E+07	5.7405E+07	4.4413E+07	3.5392E+08	0	0	3.2873E+07	0	0
22	2.2952E+08	2.2245E+07	5.7940E+07	4.4310E+07	3.5402E+08	0	0	3.5019E+07	0	0
24	2.2932E+08	2.2244E+07	5.8419E+07	4.4244E+07	3.5423E+08	0	0	3.6950E+07	0	0
26	2.2904E+08	2.2252E+07	5.8854E+07	4.4240E+07	3.5439E+08	0	0	3.8698E+07	0	0
28	2.2868E+08	2.2249E+07	5.9250E+07	4.4297E+07	3.5448E+08	0	0	4.0286E+07	0	0
30	2.2821E+08	2.2241E+07	5.9610E+07	4.4425E+07	3.5448E+08	0	0	4.1733E+07	0	0
32	2.2764E+08	2.2214E+07	5.9937E+07	4.4600E+07	3.5439E+08	0	0	4.3051E+07	0	0
34	2.2704E+08	2.2208E+07	6.0241E+07	4.4799E+07	3.5429E+08	0	5.5940E+02	4.4254E+07	0	0
36	2.2650E+08	2.2208E+07	6.0528E+07	4.5029E+07	3.5427E+08	0	4.7957E+03	4.5357E+07	0	0
38	2.2600E+08	2.2211E+07	6.0809E+07	4.5252E+07	3.5427E+08	0	1.1852E+04	4.6421E+07	0	0
40	2.2554E+08	2.2200E+07	6.1086E+07	4.5467E+07	3.5429E+08	0	2.1487E+04	4.7460E+07	0	0
42	2.2506E+08	2.2189E+07	6.1362E+07	4.5712E+07	3.5432E+08	0	3.4944E+04	4.8477E+07	0	0
44	2.2468E+08	2.2094E+07	6.1624E+07	4.5986E+07	3.5436E+08	0	5.3503E+04	4.9472E+07	0	0
46	2.2410E+08	2.2195E+07	6.1934E+07	4.6191E+07	3.5442E+08	0	7.6700E+04	5.0445E+07	0	0

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE ___ OF ___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN ___ SONGS 2 & 3 ___ Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 215 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

48	2.2362E+08	2.2198E+07	6.2215E+07	4.6443E+07	3.5447E+08	0	1.0178E+05	5.1397E+07	0	0
50	2.2314E+08	2.2197E+07	6.2494E+07	4.6684E+07	3.5452E+08	0	1.2833E+05	5.2327E+07	0	0
52	2.2265E+08	2.2183E+07	6.2767E+07	4.6946E+07	3.5454E+08	0	1.5614E+05	5.3237E+07	0	0
54	2.2211E+08	2.2164E+07	6.3035E+07	4.7231E+07	3.5454E+08	0	1.8498E+05	5.4126E+07	0	0
56	2.2155E+08	2.2159E+07	6.3308E+07	4.7512E+07	3.5453E+08	0	2.1676E+05	5.4996E+07	0	0
58	2.2094E+08	2.2154E+07	6.3600E+07	4.7802E+07	3.5450E+08	0	2.6292E+05	5.5847E+07	0	0
60	2.2032E+08	2.2146E+07	6.3915E+07	4.8095E+07	3.5448E+08	2.0012E+03	3.2534E+05	5.6679E+07	0	0
62	2.1966E+08	2.2142E+07	6.4250E+07	4.8386E+07	3.5444E+08	4.1990E+04	3.9582E+05	5.7493E+07	0	0
64	2.1902E+08	2.2132E+07	6.4651E+07	4.8606E+07	3.5441E+08	8.1914E+04	4.6619E+05	5.8291E+07	0	0
66	2.1838E+08	2.2138E+07	6.5295E+07	4.8583E+07	3.5440E+08	1.2178E+05	5.3645E+05	5.9072E+07	0	0
68	2.1779E+08	2.2121E+07	6.5929E+07	4.8562E+07	3.5440E+08	1.6158E+05	6.0660E+05	5.9836E+07	0	0
70	2.1719E+08	2.2119E+07	6.6563E+07	4.8540E+07	3.5441E+08	2.0132E+05	6.7666E+05	6.0585E+07	0	0
72	2.1661E+08	2.2118E+07	6.7194E+07	4.8520E+07	3.5444E+08	2.4100E+05	7.4661E+05	6.1320E+07	0	0
74	2.1605E+08	2.2114E+07	6.7821E+07	4.8500E+07	3.5448E+08	2.8063E+05	8.1647E+05	6.2039E+07	0	0
76	2.1551E+08	2.2104E+07	6.8443E+07	4.8480E+07	3.5454E+08	3.2020E+05	8.8623E+05	6.2745E+07	0	0
78	2.1498E+08	2.2102E+07	6.9064E+07	4.8461E+07	3.5460E+08	3.5973E+05	9.5590E+05	6.3437E+07	0	0
80	2.1446E+08	2.2100E+07	6.9681E+07	4.8443E+07	3.5468E+08	3.9919E+05	1.0255E+06	6.4115E+07	0	0
82	2.1395E+08	2.2101E+07	7.0296E+07	4.8424E+07	3.5477E+08	4.3861E+05	1.0949E+06	6.4781E+07	0	0
84	2.1346E+08	2.2092E+07	7.0906E+07	4.8407E+07	3.5487E+08	4.7798E+05	1.1643E+06	6.5434E+07	0	0
86	2.1298E+08	2.2087E+07	7.1515E+07	4.8390E+07	3.5497E+08	5.1731E+05	1.2335E+06	6.6076E+07	0	0
88	2.1252E+08	2.2080E+07	7.2119E+07	4.8373E+07	3.5509E+08	5.5658E+05	1.3027E+06	6.6705E+07	0	0
90	2.1206E+08	2.2079E+07	7.2724E+07	4.8357E+07	3.5522E+08	5.9581E+05	1.3717E+06	6.7324E+07	0	0
92	2.1161E+08	2.2165E+07	7.3329E+07	4.8356E+07	3.5546E+08	6.3500E+05	1.4406E+06	6.7930E+07	0	0
94	2.1117E+08	2.2246E+07	7.3931E+07	4.8356E+07	3.5570E+08	6.7414E+05	1.5094E+06	6.8525E+07	0	0
96	2.1074E+08	2.2331E+07	7.4532E+07	4.8357E+07	3.5596E+08	7.1324E+05	1.5780E+06	6.9109E+07	0	0
98	2.1032E+08	2.2418E+07	7.5131E+07	4.8358E+07	3.5622E+08	7.5229E+05	1.6465E+06	6.9681E+07	0	0
100	2.0991E+08	2.2502E+07	7.5727E+07	4.8360E+07	3.5650E+08	7.9130E+05	1.7148E+06	7.0243E+07	0	0
105	2.0895E+08	2.2497E+07	7.7195E+07	4.8326E+07	3.5697E+08	8.8864E+05	1.8852E+06	7.1605E+07	0	0
110	2.0806E+08	2.2488E+07	7.8650E+07	4.8294E+07	3.5749E+08	9.8572E+05	2.0551E+06	7.2912E+07	0	0
115	2.0722E+08	2.2482E+07	8.0092E+07	4.8264E+07	3.5806E+08	1.0826E+06	2.2245E+06	7.4169E+07	0	0
120	2.0643E+08	2.2472E+07	8.1523E+07	4.8237E+07	3.5866E+08	1.1792E+06	2.3935E+06	7.5378E+07	0	0
125	2.0569E+08	2.2468E+07	8.2944E+07	4.8210E+07	3.5931E+08	1.2756E+06	2.5622E+06	7.6543E+07	0	0
130	2.0498E+08	2.2465E+07	8.4357E+07	4.8185E+07	3.5999E+08	1.3718E+06	2.7305E+06	7.7667E+07	0	0
135	2.0432E+08	2.2460E+07	8.5760E+07	4.8162E+07	3.6070E+08	1.4678E+06	2.8984E+06	7.8752E+07	0	0
140	2.0371E+08	2.2450E+07	8.7154E+07	4.8140E+07	3.6145E+08	1.5637E+06	3.0660E+06	7.9801E+07	0	0
145	2.0312E+08	2.2444E+07	8.8540E+07	4.8119E+07	3.6222E+08	1.6594E+06	3.2333E+06	8.0815E+07	0	0
150	2.0248E+08	2.2434E+07	8.9938E+07	4.8096E+07	3.6295E+08	1.7549E+06	3.4002E+06	8.1797E+07	0	0
155	2.0146E+08	2.2425E+07	9.1421E+07	4.8061E+07	3.6337E+08	1.8502E+06	3.5668E+06	8.2745E+07	0	0
160	2.0043E+08	2.2414E+07	9.2907E+07	4.8023E+07	3.6377E+08	1.9452E+06	3.7328E+06	8.3658E+07	0	0
165	1.9940E+08	2.2421E+07	9.4392E+07	4.7993E+07	3.6420E+08	2.0399E+06	3.8983E+06	8.4539E+07	0	0
170	1.9843E+08	2.2411E+07	9.5861E+07	4.7957E+07	3.6466E+08	2.1344E+06	4.0631E+06	8.5389E+07	0	0
175	1.9751E+08	2.2389E+07	9.7319E+07	4.7919E+07	3.6513E+08	2.2286E+06	4.2272E+06	8.6211E+07	0	0
180	1.9660E+08	2.2377E+07	9.8775E+07	4.7887E+07	3.6564E+08	2.3226E+06	4.3906E+06	8.7005E+07	0	0
185	1.9544E+08	2.2559E+07	1.0029E+08	4.7874E+07	3.6616E+08	2.4163E+06	4.5535E+06	8.7776E+07	0	0
190	1.9471E+08	2.2380E+07	1.0170E+08	4.7838E+07	3.6663E+08	2.5099E+06	4.7160E+06	8.8524E+07	0	0
195	1.9351E+08	2.2368E+07	1.0321E+08	4.7745E+07	3.6683E+08	2.6032E+06	4.8774E+06	8.9247E+07	0	0
200	1.9233E+08	2.2356E+07	1.0471E+08	4.7626E+07	3.6702E+08	2.6961E+06	5.0379E+06	8.9943E+07	0	0
205	1.9122E+08	2.2322E+07	1.0618E+08	4.7505E+07	3.6723E+08	2.7888E+06	5.1977E+06	9.0616E+07	0	0
210	1.9008E+08	2.2333E+07	1.0767E+08	4.7384E+07	3.6746E+08	2.8811E+06	5.3566E+06	9.1267E+07	0	0

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

215	1.8902E+08	2.2304E+07	1.0913E+08	4.7263E+07	3.6771E+08	2.9732E+06	5.5147E+06	9.1896E+07	0	0
220	1.8794E+08	2.2304E+07	1.1059E+08	4.7142E+07	3.6797E+08	3.0649E+06	5.6720E+06	9.2504E+07	0	0
225	1.8691E+08	2.2297E+07	1.1203E+08	4.7021E+07	3.6826E+08	3.1564E+06	5.8285E+06	9.3094E+07	0	0
230	1.8590E+08	2.2286E+07	1.1347E+08	4.6899E+07	3.6856E+08	3.2475E+06	5.9842E+06	9.3666E+07	0	0
235	1.8493E+08	2.2264E+07	1.1490E+08	4.6778E+07	3.6887E+08	3.3384E+06	6.1392E+06	9.4220E+07	0	0
240	1.8395E+08	2.2266E+07	1.1632E+08	4.6657E+07	3.6920E+08	3.4291E+06	6.2935E+06	9.4758E+07	0	0
245	1.8300E+08	2.2259E+07	1.1774E+08	4.6536E+07	3.6953E+08	3.5194E+06	6.4470E+06	9.5281E+07	0	0
250	1.8209E+08	2.2243E+07	1.1914E+08	4.6415E+07	3.6988E+08	3.6095E+06	6.5999E+06	9.5789E+07	0	0
255	1.8117E+08	2.2242E+07	1.2054E+08	4.6295E+07	3.7024E+08	3.6994E+06	6.7520E+06	9.6286E+07	0	0
260	1.8027E+08	2.2232E+07	1.2193E+08	4.6174E+07	3.7061E+08	3.7890E+06	6.9035E+06	9.6772E+07	0	0
265	1.7939E+08	2.2223E+07	1.2332E+08	4.6054E+07	3.7099E+08	3.8783E+06	7.0544E+06	9.7247E+07	0	0
270	1.7853E+08	2.2214E+07	1.2470E+08	4.5933E+07	3.7137E+08	3.9673E+06	7.2045E+06	9.7712E+07	0	0
275	1.7768E+08	2.2205E+07	1.2607E+08	4.5813E+07	3.7176E+08	4.0560E+06	7.3541E+06	9.8167E+07	0	0
280	1.7684E+08	2.2195E+07	1.2744E+08	4.5692E+07	3.7216E+08	4.1445E+06	7.5030E+06	9.8612E+07	0	0
285	1.7601E+08	2.2186E+07	1.2880E+08	4.5572E+07	3.7256E+08	4.2328E+06	7.6513E+06	9.9048E+07	0	0
290	1.7520E+08	2.2170E+07	1.3015E+08	4.5452E+07	3.7297E+08	4.3207E+06	7.7989E+06	9.9476E+07	0	0
295	1.7439E+08	2.2172E+07	1.3150E+08	4.5332E+07	3.7339E+08	4.4085E+06	7.9460E+06	9.9895E+07	0	0
300	1.7362E+08	2.2147E+07	1.3284E+08	4.5212E+07	3.7382E+08	4.4960E+06	8.0926E+06	1.0031E+08	0	0
310	1.7209E+08	2.2118E+07	1.3550E+08	4.4972E+07	3.7468E+08	4.6702E+06	8.3839E+06	1.0110E+08	0	0
320	1.7056E+08	2.2128E+07	1.3814E+08	4.4732E+07	3.7556E+08	4.8436E+06	8.6730E+06	1.0187E+08	0	0
330	1.6910E+08	2.2109E+07	1.4076E+08	4.4491E+07	3.7646E+08	5.0161E+06	8.9599E+06	1.0261E+08	0	0
340	1.6767E+08	2.2096E+07	1.4336E+08	4.4251E+07	3.7738E+08	5.1877E+06	9.2446E+06	1.0332E+08	0	0
350	1.6628E+08	2.2071E+07	1.4595E+08	4.4011E+07	3.7830E+08	5.3585E+06	9.5277E+06	1.0402E+08	0	0
360	1.6489E+08	2.2070E+07	1.4851E+08	4.3771E+07	3.7925E+08	5.5285E+06	9.8086E+06	1.0468E+08	0	0
370	1.6356E+08	2.2054E+07	1.5106E+08	4.3531E+07	3.8020E+08	5.6977E+06	1.0088E+07	1.0533E+08	0	0
380	1.6225E+08	2.2039E+07	1.5358E+08	4.3290E+07	3.8116E+08	5.8662E+06	1.0365E+07	1.0595E+08	0	0
390	1.6099E+08	2.2018E+07	1.5608E+08	4.3049E+07	3.8214E+08	6.0338E+06	1.0640E+07	1.0655E+08	0	0
400	1.5973E+08	2.2011E+07	1.5857E+08	4.2809E+07	3.8312E+08	6.2006E+06	1.0913E+07	1.0714E+08	0	0
420	1.5732E+08	2.1983E+07	1.6348E+08	4.2339E+07	3.8512E+08	6.5321E+06	1.1455E+07	1.0825E+08	0	0
440	1.5500E+08	2.1955E+07	1.6832E+08	4.1895E+07	3.8717E+08	6.8607E+06	1.1991E+07	1.0930E+08	0	0
460	1.5276E+08	2.1928E+07	1.7311E+08	4.1471E+07	3.8927E+08	7.1864E+06	1.2521E+07	1.1028E+08	0	0
480	1.5061E+08	2.1902E+07	1.7783E+08	4.1067E+07	3.9141E+08	7.5093E+06	1.3046E+07	1.1121E+08	0	0
500	1.4852E+08	2.1877E+07	1.8251E+08	4.0682E+07	3.9358E+08	7.8292E+06	1.3566E+07	1.1210E+08	0	0
520	1.4649E+08	2.1852E+07	1.8713E+08	4.0314E+07	3.9578E+08	8.1462E+06	1.4082E+07	1.1295E+08	0	0
540	1.4451E+08	2.1827E+07	1.9170E+08	3.9960E+07	3.9800E+08	8.4603E+06	1.4592E+07	1.1376E+08	0	0
560	1.4259E+08	2.1803E+07	1.9623E+08	3.9620E+07	4.0023E+08	8.7717E+06	1.5098E+07	1.1454E+08	0	0
580	1.4071E+08	2.1779E+07	2.0071E+08	3.9293E+07	4.0249E+08	9.0804E+06	1.5599E+07	1.1528E+08	0	0
600	1.3888E+08	2.1755E+07	2.0515E+08	3.8978E+07	4.0476E+08	9.3865E+06	1.6095E+07	1.1600E+08	0	0
650	1.3447E+08	2.1705E+07	2.1608E+08	3.8236E+07	4.1048E+08	1.0142E+07	1.7321E+07	1.1768E+08	0	0
700	1.3029E+08	2.1649E+07	2.2677E+08	3.7552E+07	4.1627E+08	1.0883E+07	1.8523E+07	1.1922E+08	0	0
750	1.2634E+08	2.1595E+07	2.3725E+08	3.6910E+07	4.2209E+08	1.1610E+07	1.9702E+07	1.2061E+08	0	0
800	1.2259E+08	2.1540E+07	2.4752E+08	3.6303E+07	4.2795E+08	1.2324E+07	2.0860E+07	1.2189E+08	0	0
850	1.1903E+08	2.1489E+07	2.5760E+08	3.5725E+07	4.3385E+08	1.3023E+07	2.1997E+07	1.2304E+08	0	0
900	1.1567E+08	2.1439E+07	2.6750E+08	3.5169E+07	4.3978E+08	1.3708E+07	2.3114E+07	1.2407E+08	0	0
950	1.1247E+08	2.1390E+07	2.7722E+08	3.4629E+07	4.4571E+08	1.4379E+07	2.4212E+07	1.2500E+08	0	0
1000	1.0942E+08	2.1343E+07	2.8678E+08	3.4107E+07	4.5165E+08	1.5037E+07	2.5292E+07	1.2584E+08	0	0
1050	1.0648E+08	2.1303E+07	2.9619E+08	3.3630E+07	4.5760E+08	1.5683E+07	2.6355E+07	1.2661E+08	0	0
1100	1.0366E+08	2.1257E+07	3.0546E+08	3.3216E+07	4.6359E+08	1.6318E+07	2.7403E+07	1.2732E+08	0	0
1150	1.0096E+08	2.1213E+07	3.1461E+08	3.2851E+07	4.6963E+08	1.6942E+07	2.8434E+07	1.2796E+08	0	0

E&TS DEPARTMENT

CALCULATION SHEET

Project or DCP/FCN SONGS 2 & 3 Calc. No. N-4080-026

ICCN NO./ PRELIM. CCN NO.

PAGE OF

CCN CONVERSION: CCN NO. CCN –

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 217 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

1200	9.8356E+07	2.1169E+07	3.2365E+08	3.2529E+07	4.7570E+08	1.7555E+07	2.9449E+07	1.2855E+08	0	0
1220	9.7343E+07	2.1151E+07	3.2724E+08	3.2409E+07	4.7814E+08	1.7797E+07	2.9851E+07	1.2877E+08	0	0
1240	9.6344E+07	2.1134E+07	3.3081E+08	3.2295E+07	4.8058E+08	1.8038E+07	3.0250E+07	1.2898E+08	0	0
1260	9.5359E+07	2.1116E+07	3.3437E+08	3.2185E+07	4.8303E+08	1.8277E+07	3.0647E+07	1.2919E+08	0	0
1280	9.4387E+07	2.1099E+07	3.3791E+08	3.2079E+07	4.8548E+08	1.8515E+07	3.1042E+07	1.2939E+08	0	0
1300	9.3430E+07	2.1082E+07	3.4144E+08	3.1977E+07	4.8793E+08	1.8751E+07	3.1435E+07	1.2958E+08	0	0
1320	9.2487E+07	2.1066E+07	3.4495E+08	3.1879E+07	4.9038E+08	1.8985E+07	3.1825E+07	1.2976E+08	0	0
1340	9.1561E+07	2.1049E+07	3.4846E+08	3.1783E+07	4.9285E+08	1.9217E+07	3.2213E+07	1.2993E+08	0	0
1360	9.0650E+07	2.1032E+07	3.5194E+08	3.1691E+07	4.9532E+08	1.9448E+07	3.2599E+07	1.3010E+08	0	0
1380	8.9754E+07	2.1016E+07	3.5542E+08	3.1601E+07	4.9779E+08	1.9677E+07	3.2982E+07	1.3025E+08	0	0
1400	8.8873E+07	2.0999E+07	3.5888E+08	3.1514E+07	5.0027E+08	1.9904E+07	3.3363E+07	1.3040E+08	0	0
1450	8.6729E+07	2.0959E+07	3.6749E+08	3.1305E+07	5.0648E+08	2.0465E+07	3.4307E+07	1.3074E+08	0	0
1500	8.4663E+07	2.0920E+07	3.7602E+08	3.1107E+07	5.1271E+08	2.1015E+07	3.5238E+07	1.3104E+08	0	0
1550	8.2656E+07	2.0886E+07	3.8448E+08	3.0920E+07	5.1894E+08	2.1556E+07	3.6157E+07	1.3131E+08	0	0
1600	8.0720E+07	2.0847E+07	3.9288E+08	3.0740E+07	5.2519E+08	2.2089E+07	3.7064E+07	1.3154E+08	0	0
1650	7.8849E+07	2.0809E+07	4.0122E+08	3.0566E+07	5.3144E+08	2.2612E+07	3.7959E+07	1.3175E+08	0	0
1700	7.7039E+07	2.0771E+07	4.0950E+08	3.0397E+07	5.3770E+08	2.3127E+07	3.8841E+07	1.3192E+08	0	0
1750	7.5287E+07	2.0734E+07	4.1771E+08	3.0232E+07	5.4397E+08	2.3633E+07	3.9712E+07	1.3206E+08	0	0
1800	7.3598E+07	2.0698E+07	4.2587E+08	3.0071E+07	5.5024E+08	2.4131E+07	4.0572E+07	1.3218E+08	0	0
1850	7.1973E+07	2.0661E+07	4.3397E+08	2.9917E+07	5.5652E+08	2.4619E+07	4.1421E+07	1.3226E+08	0	0
1900	7.0403E+07	2.0626E+07	4.4202E+08	2.9772E+07	5.6282E+08	2.5099E+07	4.2258E+07	1.3231E+08	0	0
1950	6.8882E+07	2.0593E+07	4.5002E+08	2.9636E+07	5.6913E+08	2.5571E+07	4.3086E+07	1.3235E+08	0	0
2000	6.7402E+07	2.0561E+07	4.5797E+08	2.9505E+07	5.7544E+08	2.6036E+07	4.3903E+07	1.3236E+08	0	0
2050	6.5972E+07	2.0527E+07	4.6588E+08	2.9380E+07	5.8176E+08	2.6493E+07	4.4710E+07	1.3235E+08	0	0
2100	6.4586E+07	2.0494E+07	4.7374E+08	2.9260E+07	5.8808E+08	2.6942E+07	4.5508E+07	1.3232E+08	0	0
2150	6.3239E+07	2.0461E+07	4.8155E+08	2.9143E+07	5.9440E+08	2.7384E+07	4.6295E+07	1.3228E+08	0	0
2200	6.1934E+07	2.0429E+07	4.8933E+08	2.9029E+07	6.0072E+08	2.7819E+07	4.7073E+07	1.3222E+08	0	0
2250	6.0675E+07	2.0398E+07	4.9706E+08	2.8917E+07	6.0705E+08	2.8246E+07	4.7842E+07	1.3214E+08	0	0
2300	5.9457E+07	2.0367E+07	5.0476E+08	2.8807E+07	6.1339E+08	2.8666E+07	4.8601E+07	1.3204E+08	0	0
2350	5.8277E+07	2.0336E+07	5.1241E+08	2.8698E+07	6.1972E+08	2.9078E+07	4.9352E+07	1.3192E+08	0	0
2400	5.7134E+07	2.0306E+07	5.2003E+08	2.8591E+07	6.2606E+08	2.9483E+07	5.0093E+07	1.3179E+08	0	0
2420	5.6792E+07	2.0298E+07	5.1986E+08	2.9821E+07	6.2678E+08	2.9644E+07	5.0292E+07	1.3173E+08	7.0877E+07	3.9391E+05
2440	5.6465E+07	2.0269E+07	5.1973E+08	3.1025E+07	6.2749E+08	2.9804E+07	5.0491E+07	1.3168E+08	7.0813E+07	7.8744E+05
2460	5.6118E+07	2.0267E+07	5.1961E+08	3.2205E+07	6.2820E+08	2.9963E+07	5.0689E+07	1.3163E+08	7.0752E+07	1.1806E+06
2480	5.5778E+07	2.0261E+07	5.1951E+08	3.3360E+07	6.2891E+08	3.0121E+07	5.0885E+07	1.3157E+08	7.0696E+07	1.5735E+06
2500	5.5445E+07	2.0253E+07	5.1943E+08	3.4491E+07	6.2962E+08	3.0278E+07	5.1080E+07	1.3152E+08	7.0643E+07	1.9661E+06
2600	5.3837E+07	2.0214E+07	5.1931E+08	3.9796E+07	6.3315E+08	3.1055E+07	5.2038E+07	1.3122E+08	7.0454E+07	3.9254E+06
2700	5.6574E+07	2.0292E+07	5.1828E+08	4.1321E+07	6.3647E+08	3.1829E+07	5.2997E+07	1.3105E+08	7.0294E+07	5.8801E+06
2800	6.0269E+07	2.0388E+07	5.1700E+08	4.1575E+07	6.3923E+08	3.2647E+07	5.4020E+07	1.3132E+08	7.0135E+07	7.8303E+06
2900	6.3420E+07	2.0467E+07	5.1588E+08	4.1796E+07	6.4156E+08	3.3507E+07	5.5103E+07	1.3192E+08	6.9993E+07	9.7763E+06
3000	6.6188E+07	2.0535E+07	5.1489E+08	4.1983E+07	6.4359E+08	3.4401E+07	5.6237E+07	1.3273E+08	6.9866E+07	1.1719E+07
3100	6.8723E+07	2.0522E+07	5.1399E+08	4.2130E+07	6.4537E+08	3.5322E+07	5.7415E+07	1.3371E+08	6.9752E+07	1.3658E+07
3200	7.0815E+07	2.0637E+07	5.1322E+08	4.2255E+07	6.4692E+08	3.6268E+07	5.8629E+07	1.3482E+08	6.9650E+07	1.5594E+07
3300	7.2656E+07	2.0686E+07	5.1253E+08	4.2367E+07	6.4824E+08	3.7236E+07	5.9875E+07	1.3609E+08	6.9559E+07	1.7527E+07
3400	7.4311E+07	2.0723E+07	5.1191E+08	4.2467E+07	6.4941E+08	3.8222E+07	6.1150E+07	1.3743E+08	6.9477E+07	1.9458E+07
3500	7.5815E+07	2.0753E+07	5.1136E+08	4.2557E+07	6.5048E+08	3.9227E+07	6.2448E+07	1.3879E+08	6.9404E+07	2.1387E+07
3600	7.7193E+07	2.0777E+07	5.1086E+08	4.2640E+07	6.5147E+08	4.0246E+07	6.3769E+07	1.4016E+08	6.9340E+07	2.3313E+07
3700	7.8449E+07	2.0804E+07	5.1041E+08	4.2716E+07	6.5238E+08	4.1277E+07	6.5110E+07	1.4155E+08	6.9282E+07	2.5239E+07
3800	7.9618E+07	2.0828E+07	5.1000E+08	4.2785E+07	6.5324E+08	4.2320E+07	6.6469E+07	1.4295E+08	6.9231E+07	2.7162E+07

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE ___ OF ___
CCN CONVERSION: CCN NO. CCN –	

Project or DCP/FCN ___ SONGS 2 & 3 ___ Calc. No. N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events

Sheet No. 218 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

3900	8.0698E+07	2.0854E+07	5.0964E+08	4.2850E+07	6.5404E+08	4.3374E+07	6.7846E+07	1.4437E+08	6.9185E+07	2.9085E+07
4000	8.1693E+07	2.0877E+07	5.0931E+08	4.2910E+07	6.5479E+08	4.4438E+07	6.9237E+07	1.4580E+08	6.9145E+07	3.1006E+07
4500	8.5844E+07	2.0941E+07	5.0809E+08	4.3140E+07	6.5802E+08	4.9879E+07	7.6381E+07	1.5292E+08	6.9017E+07	4.0599E+07
5000	8.8646E+07	2.0994E+07	5.0748E+08	4.3313E+07	6.6044E+08	5.5486E+07	8.3770E+07	1.5994E+08	6.8975E+07	5.0181E+07
5500	9.0352E+07	2.1039E+07	5.0730E+08	4.3420E+07	6.6211E+08	6.1207E+07	9.1317E+07	1.6685E+08	6.8992E+07	5.9762E+07
6000	9.1475E+07	2.1058E+07	5.0737E+08	4.3485E+07	6.6339E+08	6.7000E+07	9.8960E+07	1.7336E+08	6.9048E+07	6.9347E+07
6500	9.2105E+07	2.1066E+07	5.0762E+08	4.3516E+07	6.6431E+08	7.2838E+07	1.0666E+08	1.7944E+08	6.9127E+07	7.8943E+07
7000	9.2284E+07	2.1075E+07	5.0799E+08	4.3524E+07	6.6487E+08	7.8695E+07	1.1438E+08	1.8514E+08	6.9217E+07	8.8550E+07
7500	9.2994E+07	2.1085E+07	5.0730E+08	4.3564E+07	6.6494E+08	8.4565E+07	1.2212E+08	1.9066E+08	6.9103E+07	9.8162E+07
8000	9.4014E+07	2.1105E+07	5.0604E+08	4.3617E+07	6.6478E+08	9.0480E+07	1.2994E+08	1.9616E+08	6.8850E+07	1.0774E+08
8500	9.4813E+07	2.1120E+07	5.0497E+08	4.3658E+07	6.6456E+08	9.6431E+07	1.3783E+08	2.0150E+08	6.8630E+07	1.1729E+08
9000	9.5423E+07	2.1129E+07	5.0403E+08	4.3690E+07	6.6427E+08	1.0241E+08	1.4577E+08	2.0669E+08	6.8436E+07	1.2680E+08
9500	9.5889E+07	2.1136E+07	5.0322E+08	4.3713E+07	6.6396E+08	1.0841E+08	1.5376E+08	2.1171E+08	6.8265E+07	1.3630E+08
10000	9.6222E+07	2.1148E+07	5.0251E+08	4.3729E+07	6.6361E+08	1.1443E+08	1.6178E+08	2.1655E+08	6.8113E+07	1.4577E+08
12500	9.6422E+07	2.1130E+07	4.9998E+08	4.3740E+07	6.6127E+08	1.4462E+08	2.0213E+08	2.3833E+08	6.7541E+07	1.9285E+08
15000	9.4599E+07	2.1089E+07	4.9828E+08	4.3647E+07	6.5761E+08	1.7462E+08	2.4232E+08	2.5666E+08	6.7085E+07	2.3959E+08
17500	9.1534E+07	2.1026E+07	4.9657E+08	4.3488E+07	6.5262E+08	2.0411E+08	2.8177E+08	2.7199E+08	6.6587E+07	2.8601E+08
20000	8.8401E+07	2.0975E+07	4.9440E+08	4.3304E+07	6.4708E+08	2.3280E+08	3.2025E+08	2.8480E+08	6.5980E+07	3.3204E+08
22500	8.5820E+07	2.0928E+07	4.9184E+08	4.3151E+07	6.4174E+08	2.6080E+08	3.5791E+08	2.9616E+08	6.5305E+07	3.7763E+08
25000	8.3185E+07	2.0981E+07	4.8916E+08	4.3008E+07	6.3633E+08	2.8819E+08	3.9485E+08	3.0634E+08	6.4600E+07	4.2273E+08
27500	8.0669E+07	2.0808E+07	4.8637E+08	4.2857E+07	6.3070E+08	3.1499E+08	4.3107E+08	3.1548E+08	6.3875E+07	4.6733E+08
30000	7.8011E+07	2.0764E+07	4.8343E+08	4.2699E+07	6.2490E+08	3.4116E+08	4.6655E+08	3.2353E+08	6.2996E+07	5.1135E+08
35000	7.2625E+07	2.0647E+07	4.7712E+08	4.2379E+07	6.1277E+08	3.9151E+08	5.3509E+08	3.3675E+08	6.1375E+07	5.9772E+08
40000	6.7967E+07	2.0548E+07	4.7039E+08	4.2106E+07	6.0101E+08	4.3910E+08	6.0049E+08	3.4682E+08	5.9685E+07	6.8178E+08
45000	6.4249E+07	2.0469E+07	4.6386E+08	4.1876E+07	5.9045E+08	4.8453E+08	6.6343E+08	3.5538E+08	5.8076E+07	7.6354E+08
50000	6.1026E+07	2.0390E+07	4.5773E+08	4.1653E+07	5.8080E+08	5.2805E+08	7.2420E+08	3.6240E+08	5.6556E+07	8.4310E+08
55000	5.8022E+07	2.0313E+07	4.5208E+08	4.1445E+07	5.7186E+08	5.6968E+08	7.8299E+08	3.6796E+08	5.5177E+07	9.2068E+08
60000	5.5454E+07	2.0243E+07	4.4681E+08	4.1272E+07	5.6378E+08	6.0964E+08	8.3994E+08	3.7289E+08	5.3898E+07	9.9640E+08
65000	5.3261E+07	2.0183E+07	4.4202E+08	4.1119E+07	5.5658E+08	6.4824E+08	8.9533E+08	3.7736E+08	5.2742E+07	1.0704E+09
70000	5.1238E+07	2.0130E+07	4.3765E+08	4.0977E+07	5.5000E+08	6.8560E+08	9.4927E+08	3.8135E+08	5.1689E+07	1.1429E+09
75000	4.9499E+07	2.0081E+07	4.3362E+08	4.0855E+07	5.4405E+08	7.2175E+08	1.0018E+09	3.8482E+08	5.0681E+07	1.2140E+09
80000	4.8081E+07	2.0037E+07	4.3002E+08	4.0754E+07	5.3889E+08	7.5678E+08	1.0533E+09	3.8802E+08	4.9821E+07	1.2838E+09
85000	4.6773E+07	1.9996E+07	4.2683E+08	4.0662E+07	5.3426E+08	7.9087E+08	1.1038E+09	3.9097E+08	4.9058E+07	1.3524E+09
90000	4.5831E+07	1.9961E+07	4.2393E+08	4.0581E+07	5.3010E+08	8.2411E+08	1.1533E+09	3.9370E+08	4.8367E+07	1.4201E+09
95000	4.4699E+07	1.9931E+07	4.2137E+08	4.0515E+07	5.2651E+08	8.5667E+08	1.2021E+09	3.9639E+08	4.7758E+07	1.4868E+09
100000	4.3792E+07	1.9902E+07	4.1915E+08	4.0456E+07	5.2329E+08	8.8866E+08	1.2502E+09	3.9904E+08	4.7227E+07	1.5528E+09
125000	4.0214E+07	1.9779E+07	4.1045E+08	4.0199E+07	5.1064E+08	1.0410E+09	1.4812E+09	4.1043E+08	4.5155E+07	1.8731E+09
150000	3.7143E+07	1.9664E+07	4.0327E+08	3.9952E+07	5.0003E+08	1.1820E+09	1.6973E+09	4.1808E+08	4.3445E+07	2.1807E+09
175000	3.4286E+07	1.9553E+07	3.9655E+08	3.9710E+07	4.9009E+08	1.3124E+09	1.8992E+09	4.2141E+08	4.1852E+07	2.4768E+09
200000	3.2186E+07	1.9465E+07	3.9055E+08	3.9528E+07	4.8173E+08	1.4335E+09	2.0884E+09	4.2293E+08	4.0444E+07	2.7623E+09
225000	3.0402E+07	1.9385E+07	3.8567E+08	3.9372E+07	4.7483E+08	1.5469E+09	2.2674E+09	4.2332E+08	3.9300E+07	3.0391E+09
250000	2.8642E+07	1.9304E+07	3.8093E+08	3.9220E+07	4.6810E+08	1.6531E+09	2.4364E+09	4.2233E+08	3.8186E+07	3.3082E+09
275000	2.7172E+07	1.9233E+07	3.7631E+08	3.9089E+07	4.6180E+08	1.7528E+09	2.5955E+09	4.2015E+08	3.7055E+07	3.5693E+09
300000	2.6052E+07	1.9177E+07	3.7265E+08	3.8989E+07	4.5687E+08	1.8475E+09	2.7471E+09	4.1790E+08	3.6204E+07	3.8236E+09
400000	2.2208E+07	1.8965E+07	3.6042E+08	3.8641E+07	4.4023E+08	2.1805E+09	3.2874E+09	4.0404E+08	3.3354E+07	4.7896E+09
500000	1.9583E+07	1.8802E+07	3.5048E+08	3.8396E+07	4.2726E+08	2.4537E+09	3.7282E+09	3.8286E+08	3.1070E+07	5.6803E+09
600000	1.7801E+07	1.8681E+07	3.4365E+08	3.8226E+07	4.1836E+08	2.6886E+09	4.1042E+09	3.6396E+08	2.9492E+07	6.5215E+09
700000	1.6149E+07	1.8559E+07	3.3666E+08	3.8065E+07	4.0943E+08	2.8907E+09	4.4186E+09	3.4444E+08	2.7883E+07	7.3183E+09
800000	1.5288E+07	1.8490E+07	3.3260E+08	3.7977E+07	4.0435E+08	3.0669E+09	4.6861E+09	3.2819E+08	2.6952E+07	8.0790E+09

900000	1.4494E+07	1.8425E+07	3.2887E+08	3.7878E+07	3.9967E+08	3.2251E+09	4.9210E+09	3.1484E+08	2.6098E+07	8.8158E+09
1000000	1.3719E+07	1.8358E+07	3.2513E+08	3.7781E+07	3.9499E+08	3.3674E+09	5.1229E+09	3.0248E+08	2.5242E+07	9.5289E+09
1250000	1.2627E+07	1.8258E+07	3.1921E+08	3.7639E+07	3.8774E+08	3.6727E+09	5.5170E+09	2.8210E+08	2.3896E+07	1.1228E+10
1500000	1.1865E+07	1.8183E+07	3.1494E+08	3.7538E+07	3.8253E+08	3.9324E+09	5.8108E+09	2.7327E+08	2.2909E+07	1.2851E+10
1750000	1.1150E+07	1.8110E+07	3.1081E+08	3.7442E+07	3.7751E+08	4.1496E+09	6.0147E+09	2.6689E+08	2.1980E+07	1.4410E+10
2000000	1.0446E+07	1.8034E+07	3.0657E+08	3.7346E+07	3.7239E+08	4.3298E+09	6.1252E+09	2.5968E+08	2.1023E+07	1.5903E+10
2500000	8.9781E+06	1.7939E+07	2.9963E+08	3.6786E+07	3.6334E+08	4.5512E+09	6.1172E+09	2.4075E+08	1.9446E+07	1.8721E+10
3000000	8.7427E+06	1.7930E+07	2.9332E+08	3.5310E+07	3.5530E+08	4.6887E+09	6.0127E+09	2.1834E+08	1.8040E+07	2.1300E+10
3500000	8.7349E+06	1.7818E+07	2.8905E+08	3.4234E+07	3.4984E+08	4.8115E+09	5.9151E+09	2.0248E+08	1.7080E+07	2.3739E+10
4000000	8.6467E+06	1.7807E+07	2.8481E+08	3.3155E+07	3.4442E+08	4.9219E+09	5.8279E+09	1.8705E+08	1.6123E+07	2.6044E+10
5000000	8.4523E+06	1.7781E+07	2.7625E+08	3.0969E+07	3.3345E+08	5.1051E+09	5.6826E+09	1.6122E+08	1.4193E+07	3.0254E+10
6000000	8.1926E+06	1.7858E+07	2.6762E+08	2.8752E+07	3.2242E+08	5.2372E+09	5.5733E+09	1.4552E+08	1.2247E+07	3.3925E+10
7000000	8.1046E+06	1.7847E+07	2.6404E+08	2.7851E+07	3.1784E+08	5.3313E+09	5.4868E+09	1.4141E+08	1.1440E+07	3.7205E+10
8000000	8.0074E+06	1.7837E+07	2.6084E+08	2.7026E+07	3.1371E+08	5.4052E+09	5.4119E+09	1.4532E+08	1.0713E+07	4.0282E+10
9000050	7.9120E+06	1.7828E+07	2.5767E+08	2.6199E+07	3.0961E+08	5.4597E+09	5.3475E+09	1.5562E+08	9.9981E+06	4.3157E+10
10000050	7.8241E+06	1.7819E+07	2.5450E+08	2.5369E+07	3.0551E+08	5.4939E+09	5.2952E+09	1.7351E+08	9.2844E+06	4.5837E+10

COPATTA run I/O file: case7lca.dat/.lis

Reactor vessel energy not calculated until end of initial RCS Blowdown (12.2 seconds for Case 7).

ECU operation begins at 60 seconds post-LOCA; containment spray flow begins at 33 seconds and reaches full flow at 60 seconds.

Sump recirculation begins at 2401 seconds.

lcarslts.wb2

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Glimer	12/17/99					

REV ⇒

TABLE 9-7C: SUMMARY OF HEAT SINK RESULTS FOR CASE 7

Time (sec)	Heat Sink Surface Temperatures (F) HS #2 Liner Plate	HS #10 - Sec Shield Wall	HS #18 - CS Th </= 0.5"	HS #19 - Elec & Galv CS	Tag/Uch Cond. HTC (B/hr-ft2-F)
0	118.4	120.0	120.0	119.9	2.00
1	127.8	132.0	129.3	120.7	31.15
10	220.5	248.7	220.9	202.9	311.51
20	220.2	246.9	220.9	252.1	212.10
40	214.8	236.1	218.9	261.3	93.15
60	221.6	237.6	228.9	262.2	91.73
80	226.1	238.1	236.0	262.2	90.05
100	229.0	238.2	241.0	262.1	87.38
150	233.5	238.7	248.4	261.9	84.98
200	234.8	237.7	250.8	261.5	81.39
250	234.4	235.8	250.6	261.0	77.37
300	233.2	233.8	250.5	260.3	73.68
350	231.9	232.1	250.4	259.5	70.19
400	230.4	230.3	250.2	258.6	66.81
500	227.5	227.1	249.7	256.6	61.70
600	224.7	224.1	249.1	254.4	58.59
800	219.5	218.7	247.5	249.5	52.24
1000	214.0	213.0	245.4	244.3	45.86
1200	209.4	208.4	243.1	238.9	42.25
1300	207.2	206.2	241.8	236.2	40.37
1400	205.0	203.9	240.4	233.5	38.45
1600	200.8	199.6	237.6	228.2	35.39
1800	196.9	195.7	234.6	223.0	32.73
2000	193.1	191.9	231.4	217.9	29.97
2200	189.6	188.3	228.1	212.9	28.15
2400	186.2	184.9	224.8	208.2	26.84
2500	184.7	183.6	223.2	205.9	26.32
3000	187.3	188.4	216.5	198.6	29.34
3500	194.2	195.2	213.1	202.1	33.60
4000	198.5	199.3	211.4	206.0	35.71
6000	206.6	207.0	212.3	212.4	39.54
8000	209.0	209.3	213.7	213.8	40.58
10000	210.8	211.0	214.9	215.0	41.46
20000	207.8	207.9	212.1	211.2	38.19
30000	202.0	202.1	205.5	204.8	34.40
40000	195.4	195.5	198.3	197.5	30.20
50000	190.2	190.3	192.6	192.1	27.90
60000	185.6	185.8	187.8	187.4	26.31
70000	182.1	182.2	183.8	183.5	24.88
80000	178.9	179.1	180.6	180.3	23.78
90000	176.4	176.6	178.0	177.8	23.14
100000	174.5	174.8	176.0	175.9	22.60
200000	161.1	161.9	161.8	161.7	18.90
300000	152.1	155.0	152.5	152.5	16.54
400000	145.4	149.4	145.7	145.7	15.27
500000	140.3	144.4	140.5	140.5	14.12

600000	136.6	140.4	136.6	136.6	13.14
700000	132.7	136.4	132.6	132.7	12.04
800000	130.4	133.5	130.5	130.5	11.38
900000	128.3	131.0	128.4	128.4	10.69
1000000	126.2	128.7	126.2	126.3	9.99
2000000	115.6	116.8	115.9	115.9	8.80
3000000	111.5	112.5	112.3	112.3	7.61
4000000	110.8	111.8	111.6	111.7	7.56
5000000	110.1	111.0	110.9	111.0	7.46
6000000	109.4	110.3	110.2	110.2	7.32
7000000	109.1	109.9	109.8	109.9	7.27
8000000	108.8	109.6	109.5	109.6	7.21
9000050	108.6	109.3	109.3	109.3	7.15
10000050	108.3	109.0	109.0	109.0	7.10

COPATTA run I/O file: case7lca.dat/.lls

Maximum Tagami HTC = 342.7 Btu/hr-ft2-F @ 11 seconds

lcarslts.wb2

TABLE 9-8A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 8

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	17.83	3.13	111.8	216.1	0.0
0.2	19.48	4.78	133.1	219.3	0.0
0.3	20.85	6.15	146.1	217.7	0.0
0.4	22.07	7.37	156.0	218.1	0.0
0.5	23.19	8.49	163.9	218.2	0.0
0.6	24.24	9.54	170.5	218.8	0.0
0.7	25.24	10.54	176.2	218.6	0.0
0.8	26.18	11.48	181.1	218.1	0.0
0.9	27.06	12.36	185.4	218.9	0.0
1	27.88	13.18	189.1	218.9	0.0
2	34.97	20.27	214.7	223.7	0.0
3	40.89	26.19	230.5	230.9	0.0
4	45.80	31.10	241.3	236.7	0.0
5	49.92	35.22	249.3	241.4	0.0
6	53.27	38.57	255.2	245.3	0.0
7	56.21	41.51	260.1	246.9	0.0
8	58.16	43.46	263.3	247.6	0.0
9	59.33	44.63	265.1	248.0	0.0
10	60.03	45.33	265.9	248.3	0.0
11	60.42	45.72	266.7	248.6	0.0
12	60.27	45.57	267.4	248.7	0.0
13	59.98	45.28	266.7	248.9	292.7
14	59.74	45.04	266.0	249.0	292.4
15	59.54	44.84	265.4	249.1	292.2
16	59.38	44.68	264.9	249.2	292.0
17	59.24	44.54	264.7	249.3	291.8
18	59.13	44.43	264.5	249.4	291.7
19	59.03	44.33	264.4	249.5	291.6
20	58.99	44.29	264.2	249.5	291.5
22	58.87	44.17	264.0	249.7	291.4
24	58.76	44.06	263.9	249.8	291.3
26	58.65	43.95	263.7	249.9	291.1
28	58.52	43.82	263.5	250.0	291.0
30	58.44	43.74	264.2	250.1	290.9
32	58.23	43.53	263.1	250.5	290.6
34	58.05	43.35	262.9	251.0	290.4
36	57.85	43.15	262.6	251.4	290.2
38	57.74	43.04	262.5	251.9	290.1
40	57.59	42.89	262.1	252.3	289.9
42	57.43	42.73	261.9	252.7	289.7
44	57.28	42.58	261.7	253.1	289.5
46	57.14	42.44	261.4	253.5	289.4
48	56.99	42.29	261.2	253.8	289.2
50	56.84	42.14	261.0	254.2	289.0
52	56.68	41.98	260.7	254.6	288.8
54	56.52	41.82	260.5	254.9	288.7
56	56.35	41.65	260.2	255.2	288.5

58	56.18	41.48	259.9	255.6	288.3
60	56.01	41.31	259.6	255.9	288.1
62	55.81	41.11	259.3	256.2	287.8
64	55.63	40.93	259.0	256.5	287.6
66	55.44	40.74	258.7	256.8	287.4
68	55.26	40.56	258.4	257.1	287.2
70	55.09	40.39	258.2	257.3	287.0
72	54.91	40.21	257.9	257.6	286.8
74	54.74	40.04	257.6	257.8	286.6
76	54.57	39.87	257.3	258.1	286.4
78	54.40	39.70	257.0	258.3	286.2
80	54.24	39.54	256.8	258.5	286.0
82	54.08	39.38	256.5	258.7	285.8
84	53.93	39.23	256.3	258.9	285.6
86	53.81	39.11	256.0	259.1	285.5
88	53.63	38.93	255.7	259.3	285.3
90	53.48	38.78	255.5	259.5	285.1
92	53.46	38.76	255.2	259.7	285.0
94	53.40	38.70	255.0	259.9	284.9
96	53.36	38.66	254.9	260.0	284.9
98	53.33	38.63	254.7	260.2	284.9
100	53.28	38.58	254.4	260.4	284.9
105	52.94	38.24	253.9	260.8	284.5
110	52.63	37.93	253.4	261.1	284.1
115	52.32	37.62	252.8	261.4	283.7
120	52.02	37.32	252.2	261.8	283.4
125	51.74	37.04	251.8	262.0	283.1
130	51.46	36.76	251.3	262.3	282.7
135	51.19	36.49	250.8	262.5	282.4
140	50.93	36.23	250.3	262.8	282.1
145	50.68	35.98	249.8	263.0	281.8
150	50.42	35.72	249.4	263.2	281.3
155	50.17	35.47	248.9	263.3	279.3
160	49.92	35.22	248.4	263.5	277.2
165	49.69	34.99	248.0	263.5	275.1
170	49.46	34.76	247.6	263.6	273.1
175	49.23	34.53	247.2	263.6	271.1
180	49.05	34.35	246.7	263.6	269.2
185	48.84	34.14	246.3	263.6	267.3
190	48.63	33.93	245.9	263.5	265.2
195	48.43	33.73	245.5	263.4	261.6
200	48.28	33.58	245.4	263.3	258.1
205	48.09	33.39	244.9	263.1	254.6
210	47.90	33.20	244.6	262.9	251.3
215	47.72	33.02	244.2	262.7	248.1
220	47.54	32.84	243.8	262.4	245.1
225	47.37	32.67	243.5	262.1	242.1
230	47.19	32.49	243.2	261.8	239.3
235	47.02	32.32	242.8	261.4	236.5
240	46.86	32.16	242.5	261.0	233.9
245	46.69	31.99	242.2	260.6	231.4
250	46.52	31.82	241.8	260.2	228.9
255	46.37	31.67	241.5	259.8	226.6
260	46.21	31.51	241.1	259.3	224.3

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 224 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

265	46.05	31.35	240.8	258.9	222.1
270	45.90	31.20	240.5	258.4	220.0
275	45.75	31.05	240.2	257.9	218.0
280	45.60	30.90	239.9	257.5	216.0
285	45.46	30.76	239.6	257.0	214.1
290	45.31	30.61	239.3	256.5	212.3
295	45.17	30.47	239.0	256.0	210.5
300	45.03	30.33	238.7	255.4	208.8
310	44.76	30.06	238.1	254.4	205.6
320	44.49	29.79	237.5	253.4	202.5
330	44.22	29.52	236.9	252.3	199.7
340	44.00	29.30	236.4	251.2	197.0
350	43.72	29.02	235.8	250.2	194.5
360	43.47	28.77	235.2	249.1	192.2
370	43.23	28.53	234.7	248.0	189.9
380	43.00	28.30	234.2	246.9	187.8
390	42.85	28.15	233.8	245.9	185.9
400	42.62	27.92	233.3	244.8	184.0
420	42.18	27.48	232.3	242.7	180.6
440	41.76	27.06	231.3	240.7	177.6
460	41.35	26.65	230.3	238.7	175.1
480	40.95	26.25	229.3	236.8	172.8
500	40.57	25.87	228.4	234.9	170.8
520	40.20	25.50	227.4	233.1	169.0
540	39.83	25.13	226.5	231.4	167.5
560	39.48	24.78	225.6	229.7	166.1
580	39.14	24.44	224.7	228.1	164.8
600	38.81	24.11	223.8	226.5	163.6
650	38.02	23.32	221.7	222.8	161.2
700	37.34	22.64	219.8	219.5	159.1
750	36.63	21.93	217.8	216.4	157.3
800	35.96	21.26	215.8	213.5	155.7
850	35.32	20.62	213.8	210.8	154.2
900	34.72	20.02	211.9	208.4	152.8
950	34.15	19.45	210.1	206.1	151.4
1000	33.61	18.91	208.3	203.9	150.1
1050	33.13	18.43	206.7	201.8	148.9
1100	32.64	17.94	204.9	199.9	148.1
1150	32.17	17.47	203.2	198.1	147.3
1200	31.73	17.03	201.6	196.4	146.7
1220	31.55	16.85	200.9	195.7	146.5
1240	31.38	16.68	200.3	195.1	146.3
1260	31.21	16.51	199.6	194.5	146.1
1280	31.04	16.34	198.9	193.8	145.9
1300	30.88	16.18	198.3	193.2	145.7
1320	30.73	16.03	197.7	192.7	145.5
1340	30.59	15.89	197.1	192.1	145.3
1360	30.45	15.75	196.5	191.8	149.4
1380	30.31	15.61	196.0	191.7	157.6
1400	30.16	15.46	195.4	191.6	165.7
1450	29.82	15.12	194.0	191.5	184.7
1500	29.49	14.79	192.7	191.4	202.5
1550	29.17	14.47	191.3	191.4	219.1
1600	28.87	14.17	190.0	191.6	234.5

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99					

REV ⇓

1650	28.65	13.95	189.2	191.7	247.5
1700	28.94	14.24	190.3	191.8	248.1
1750	29.19	14.49	191.4	192.0	248.6
1800	29.42	14.72	192.4	192.1	249.1
1850	29.63	14.93	193.3	192.2	249.5
1900	29.80	15.10	193.9	192.4	249.9
1950	29.96	15.26	194.6	192.5	250.2
2000	30.11	15.41	195.2	192.7	250.5
2050	30.25	15.55	195.8	192.8	250.8
2100	30.37	15.67	196.2	193.0	251.0
2150	30.49	15.79	196.7	193.2	251.2
2200	30.59	15.89	197.1	193.3	251.4
2250	30.68	15.98	197.4	193.5	251.5
2300	30.74	16.04	197.7	193.6	251.6
2350	30.81	16.11	198.0	193.8	251.8
2400	30.88	16.18	198.2	194.0	251.9
2420	30.91	16.21	198.3	194.0	251.9
2440	30.93	16.23	198.4	194.1	252.0
2460	30.95	16.25	198.5	194.2	252.0
2480	30.98	16.28	198.6	194.2	252.1
2500	30.99	16.29	198.6	194.3	252.1
2600	31.08	16.38	199.0	194.6	252.3
2700	31.15	16.45	199.2	194.9	252.4
2800	31.19	16.49	199.4	195.3	252.5
2900	31.23	16.53	199.5	195.6	252.5
3000	31.26	16.56	199.6	195.9	252.6
3100	31.26	16.56	199.7	196.2	252.6
3200	31.27	16.57	199.7	196.5	252.6
3300	31.27	16.57	199.7	196.8	252.6
3400	31.26	16.56	199.6	197.1	252.6
3500	31.24	16.54	199.6	197.4	252.6
3600	31.21	16.51	199.5	197.7	252.5
3700	31.18	16.48	199.4	198.0	252.5
3800	31.16	16.46	199.3	198.3	252.4
3900	31.13	16.43	199.1	198.6	252.4
4000	31.10	16.40	199.0	198.8	252.3
4500	30.94	16.24	198.5	200.1	252.0
5000	30.77	16.07	197.8	201.2	251.7
5500	30.59	15.89	197.1	202.2	251.4
6000	30.38	15.68	196.3	203.1	251.0
6500	30.15	15.45	195.3	203.9	250.6
7000	29.90	15.20	194.3	204.6	250.2
7500	29.79	15.09	193.9	204.8	249.9
8000	29.77	15.07	193.8	204.8	249.9
8500	29.71	15.01	193.6	204.9	249.7
9000	29.63	14.93	193.3	204.9	249.6
9500	29.55	14.85	192.9	204.9	249.4
10000	29.47	14.77	192.6	204.9	249.3
12500	28.99	14.29	190.5	204.5	248.3
15000	28.43	13.73	188.1	203.9	247.1
17500	27.83	13.13	185.3	203.0	245.9
20000	27.28	12.58	182.7	201.8	244.8
22500	26.88	12.18	180.7	200.6	243.9
25000	26.51	11.81	178.9	199.4	243.2

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 226 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

27500	26.15	11.45	177.0	198.3	242.5
30000	25.80	11.10	175.0	197.1	241.7
35000	25.10	10.40	171.1	194.9	240.3
40000	24.52	9.82	167.6	192.7	238.9
45000	24.08	9.38	164.8	190.7	237.8
50000	23.68	8.98	162.1	189.0	236.9
55000	23.35	8.65	159.9	187.4	236.1
60000	23.09	8.39	158.0	186.1	235.4
65000	22.85	8.15	156.3	185.0	234.9
70000	22.61	7.91	154.5	184.0	234.3
75000	22.40	7.70	152.9	183.0	233.8
80000	22.23	7.53	151.5	182.1	233.4
85000	22.08	7.38	150.3	181.4	233.0
90000	21.95	7.25	149.2	180.7	232.7
95000	21.84	7.14	148.3	180.1	232.4
100000	21.74	7.04	147.5	179.5	232.2
125000	21.30	6.60	143.6	177.4	231.1
150000	20.91	6.21	140.0	175.6	230.2
175000	20.54	5.84	136.3	173.8	229.3
200000	20.27	5.57	133.6	172.3	228.6
225000	20.04	5.34	131.1	171.1	228.1
250000	19.83	5.13	128.7	170.0	227.4
275000	19.64	4.94	126.5	168.8	226.9
300000	19.46	4.76	125.8	168.2	226.3
400000	18.95	4.25	117.8	164.8	224.9
500000	18.78	4.08	115.6	159.7	215.6
600000	18.72	4.02	114.7	155.6	207.5
700000	18.67	3.97	114.7	151.9	200.0
800000	18.67	3.97	115.6	149.8	195.9
900000	18.60	3.90	113.7	147.8	191.9
1000000	18.60	3.90	114.7	145.9	188.1
1250000	18.56	3.86	114.0	143.4	182.9
1500000	18.45	3.75	110.8	141.4	178.8
1750000	18.46	3.76	111.8	139.5	174.8
2000000	18.44	3.74	111.4	137.5	170.7
2500000	18.37	3.67	110.5	133.5	162.4
3000000	18.38	3.68	111.5	131.6	158.5
3500000	18.37	3.67	111.3	130.2	155.7
4000000	18.35	3.65	111.1	128.9	152.8
5000000	18.33	3.63	110.6	126.2	147.1
6000000	18.28	3.58	110.0	123.4	141.4
7000000	18.25	3.55	109.8	122.2	139.0
8000000	18.24	3.54	109.5	121.2	136.9
9000050	18.24	3.54	109.2	120.1	134.8
10000050	18.21	3.51	109.0	119.1	132.6

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of initial blowdown (12.2 seconds for Case 8)
COPATTA run I/O file: case8lca.dat/.lis

lcarslts.wb2

TABLE 9-9A: SUMMARY OF CONTAINMENT CONDITIONS FOR CASE 9

Time (seconds)	Containment Pressure Absolute (psia)	Containment Pressure Gauge (psig)	Vapor Temp (F)	Sump Temp (F)	Rx Vessel Temp * (F)
0.0	16.80	2.10	120.0	120.0	0.0
0.1	17.83	3.13	111.8	216.1	0.0
0.2	19.48	4.78	133.1	219.3	0.0
0.3	20.85	6.15	146.1	217.7	0.0
0.4	22.07	7.37	156.0	218.1	0.0
0.5	23.19	8.49	163.9	218.2	0.0
0.6	24.24	9.54	170.5	218.8	0.0
0.7	25.24	10.54	176.2	218.6	0.0
0.8	26.18	11.48	181.1	218.1	0.0
0.9	27.06	12.36	185.4	218.9	0.0
1	27.88	13.18	189.1	218.9	0.0
2	34.97	20.27	214.7	223.7	0.0
3	40.89	26.19	230.5	230.9	0.0
4	45.80	31.10	241.3	236.7	0.0
5	49.92	35.22	249.3	241.4	0.0
6	53.27	38.57	255.2	245.3	0.0
7	56.21	41.51	260.1	246.9	0.0
8	58.16	43.46	263.3	247.6	0.0
9	59.33	44.63	265.1	248.0	0.0
10	60.03	45.33	265.9	248.3	0.0
11	60.42	45.72	266.7	248.6	0.0
12	60.27	45.57	267.4	248.7	0.0
13	59.98	45.28	266.7	248.9	292.7
14	59.74	45.04	266.0	249.0	292.4
15	59.54	44.84	265.4	249.1	292.2
16	59.38	44.68	264.9	249.2	292.0
17	59.24	44.54	264.7	249.3	291.8
18	59.13	44.43	264.5	249.4	291.7
19	59.03	44.33	264.4	249.5	291.6
20	58.99	44.29	264.2	249.5	291.5
22	58.87	44.17	264.0	249.7	291.4
24	58.76	44.06	263.9	249.8	291.3
26	58.65	43.95	263.7	249.9	291.1
28	58.52	43.82	263.5	250.0	291.0
30	58.44	43.74	264.2	250.1	290.9
32	58.23	43.53	263.1	250.5	290.6
34	58.05	43.35	262.9	251.0	290.4
36	57.89	43.19	262.6	251.4	290.2
38	57.73	43.03	262.4	251.9	290.1
40	57.58	42.88	262.1	252.3	289.9
42	57.43	42.73	261.9	252.7	289.7
44	57.27	42.57	261.7	253.1	289.5
46	57.12	42.42	261.4	253.5	289.4
48	56.97	42.27	261.2	253.8	289.2
50	56.81	42.11	260.9	254.2	289.0
52	56.65	41.95	260.7	254.6	288.8
54	56.48	41.78	260.4	254.9	288.6
56	56.31	41.61	260.1	255.2	288.4

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

CCN CONVERSION: CCN NO. CCN --

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 228 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

58	56.13	41.43	259.8	255.6	288.2
60	55.94	41.24	259.5	255.9	288.0
62	55.74	41.04	259.2	256.2	287.7
64	55.55	40.85	258.9	256.5	287.5
66	55.36	40.66	258.6	256.8	287.3
68	55.17	40.47	258.3	257.0	287.1
70	54.99	40.29	258.0	257.3	286.9
72	54.81	40.11	257.7	257.5	286.7
74	54.63	39.93	257.4	257.8	286.4
76	54.46	39.76	257.1	258.0	286.2
78	54.29	39.59	256.8	258.2	286.0
80	54.13	39.43	256.6	258.4	285.9
82	53.96	39.26	256.3	258.6	285.7
84	53.80	39.10	256.0	258.8	285.5
86	53.65	38.95	255.8	259.0	285.3
88	53.49	38.79	255.5	259.2	285.1
90	53.34	38.64	255.2	259.3	284.9
92	53.27	38.57	255.0	259.5	284.8
94	53.28	38.58	254.8	259.7	284.8
96	53.19	38.49	254.6	259.8	284.7
98	53.12	38.42	254.4	260.0	284.7
100	53.10	38.40	254.1	260.1	284.6
105	52.76	38.06	253.6	260.5	284.3
110	52.43	37.73	253.0	260.8	283.9
115	52.11	37.41	252.4	261.0	283.5
120	51.81	37.11	251.9	261.3	283.1
125	51.51	36.81	251.3	261.5	282.8
130	51.22	36.52	250.8	261.7	282.5
135	50.94	36.24	250.3	261.9	282.1
140	50.67	35.97	249.8	262.1	281.8
145	50.41	35.71	249.3	262.2	281.5
150	50.14	35.44	248.8	262.4	281.0
155	49.89	35.19	248.4	262.5	279.1
160	49.66	34.96	247.9	262.5	276.9
165	49.42	34.72	247.5	262.6	274.8
170	49.14	34.44	247.0	262.6	272.8
175	48.91	34.21	246.5	262.6	270.9
180	48.68	33.98	246.1	262.5	269.0
185	48.46	33.76	245.6	262.4	267.1
190	48.24	33.54	245.2	262.3	265.0
195	48.12	33.42	245.0	262.2	261.5
200	47.91	33.21	244.6	262.0	258.0
205	47.71	33.01	244.2	261.8	254.5
210	47.51	32.81	243.8	261.6	251.2
215	47.33	32.63	243.4	261.3	248.1
220	47.14	32.44	243.1	261.0	245.0
225	46.95	32.25	242.7	260.7	242.1
230	46.77	32.07	242.3	260.3	239.3
235	46.59	31.89	241.9	259.9	236.5
240	46.42	31.72	241.6	259.5	233.9
245	46.24	31.54	241.2	259.1	231.4
250	46.07	31.37	240.9	258.7	228.9
255	45.91	31.21	240.5	258.3	226.6
260	45.74	31.04	240.2	257.8	224.3

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN –	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 229 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

265	45.58	30.88	239.8	257.3	222.2
270	45.43	30.73	239.5	256.9	220.1
275	45.28	30.58	239.2	256.4	218.0
280	45.13	30.43	238.9	255.9	216.1
285	44.98	30.28	238.5	255.4	214.2
290	44.83	30.13	238.2	254.9	212.4
295	44.65	29.95	237.9	254.4	210.6
300	44.51	29.81	237.6	253.9	208.9
310	44.21	29.51	236.9	252.8	205.7
320	43.93	29.23	236.2	251.8	202.7
330	43.65	28.95	235.6	250.7	199.9
340	43.38	28.68	235.0	249.7	197.2
350	43.12	28.42	234.4	248.6	194.7
360	42.95	28.25	234.7	247.6	192.3
370	42.65	27.95	233.4	246.5	190.1
380	42.41	27.71	232.9	245.5	188.0
390	42.19	27.49	232.3	244.5	186.1
400	41.96	27.26	231.7	243.4	184.2
420	41.49	26.79	230.6	241.4	180.8
440	41.04	26.34	229.5	239.4	177.9
460	40.61	25.91	228.5	237.5	175.3
480	40.19	25.49	227.4	235.7	173.0
500	39.79	25.09	226.4	233.9	171.0
520	39.39	24.69	225.4	232.1	169.3
540	39.01	24.31	224.4	230.4	167.7
560	38.64	23.94	223.4	228.8	166.3
580	38.29	23.59	222.4	227.2	165.0
600	37.94	23.24	221.5	225.7	163.9
650	37.16	22.46	219.3	222.2	161.4
700	36.37	21.67	217.0	218.9	159.4
750	35.62	20.92	214.7	216.0	157.6
800	34.90	20.20	212.5	213.2	155.9
850	34.24	19.54	210.4	210.6	154.4
900	33.61	18.91	208.3	208.2	153.0
950	33.04	18.34	206.3	206.0	151.6
1000	32.47	17.77	204.3	203.9	150.3
1050	31.93	17.23	202.4	201.9	149.1
1100	31.42	16.72	200.4	200.0	148.2
1150	30.93	16.23	198.5	198.3	147.5
1200	30.49	15.79	196.7	196.6	146.9
1220	30.32	15.62	196.0	196.2	151.1
1240	30.18	15.48	195.5	196.1	159.7
1260	30.03	15.33	194.9	196.0	168.0
1280	29.89	15.19	194.3	195.9	176.0
1300	29.75	15.05	193.7	195.8	183.9
1320	29.61	14.91	193.2	195.7	191.5
1340	29.48	14.78	192.6	195.7	198.9
1360	29.34	14.64	192.0	195.6	206.1
1380	29.21	14.51	191.5	195.6	213.1
1400	29.08	14.38	190.9	195.6	219.9
1450	28.77	14.07	189.6	195.6	236.1
1500	28.64	13.94	189.0	195.6	247.5
1550	28.95	14.25	190.4	195.6	248.1
1600	29.23	14.53	191.6	195.7	248.7

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 230 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

1650	29.47	14.77	192.6	195.7	249.2
1700	29.68	14.98	193.5	195.7	249.6
1750	29.87	15.17	194.2	195.8	250.0
1800	30.04	15.34	194.9	195.9	250.4
1850	30.20	15.50	195.6	195.9	250.7
1900	30.34	15.64	196.1	196.0	250.9
1950	30.47	15.77	196.6	196.1	251.2
2000	30.58	15.88	197.1	196.1	251.4
2050	30.69	15.99	197.5	196.2	251.6
2100	30.76	16.06	197.8	196.3	251.7
2150	30.85	16.15	198.1	196.4	251.8
2200	30.93	16.23	198.4	196.5	252.0
2250	30.99	16.29	198.6	196.6	252.1
2300	31.06	16.36	198.9	196.6	252.2
2350	31.11	16.41	199.1	196.7	252.3
2400	31.16	16.46	199.3	196.8	252.4
2420	31.18	16.48	199.3	196.9	252.4
2440	31.19	16.49	199.4	196.9	252.5
2460	31.21	16.51	199.4	196.9	252.5
2480	31.22	16.52	199.5	197.0	252.5
2500	31.24	16.54	199.6	197.0	252.5
2600	31.29	16.59	199.8	197.2	252.7
2700	31.33	16.63	199.9	197.4	252.7
2800	31.36	16.66	200.1	197.6	252.8
2900	31.37	16.67	200.1	197.8	252.8
3000	31.37	16.67	200.1	198.0	252.8
3100	31.36	16.66	200.1	198.1	252.8
3200	31.34	16.64	200.0	198.3	252.8
3300	31.32	16.62	199.9	198.5	252.7
3400	31.30	16.60	199.8	198.7	252.7
3500	31.26	16.56	199.7	198.8	252.6
3600	31.22	16.52	199.5	199.0	252.5
3700	31.18	16.48	199.3	199.1	252.5
3800	31.13	16.43	199.2	199.3	252.4
3900	31.09	16.39	199.0	199.4	252.3
4000	31.05	16.35	198.8	199.5	252.2
4500	30.82	16.12	198.0	200.1	251.8
5000	30.60	15.90	197.1	200.6	251.4
5500	30.33	15.63	196.1	200.9	251.0
6000	30.06	15.36	195.0	201.2	250.5
6500	29.77	15.07	193.8	201.3	249.9
7000	29.46	14.76	192.6	201.3	249.3
7500	29.32	14.62	192.0	200.9	249.0
8000	29.25	14.55	191.7	200.3	248.8
8500	29.15	14.45	191.2	199.8	248.6
9000	29.03	14.33	190.7	199.3	248.4
9500	28.91	14.21	190.2	198.8	248.1
10000	28.78	14.08	189.6	198.3	247.8
12500	28.10	13.40	186.6	196.0	246.5
15000	27.36	12.66	183.1	193.7	245.0
17500	26.66	11.96	179.6	191.4	243.5
20000	26.05	11.35	176.4	189.2	242.2
22500	25.55	10.85	173.7	187.1	241.2
25000	25.11	10.41	171.1	185.1	240.3

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE__ OF__
CCN CONVERSION: CCN NO. CCN --	

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 231 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

27500	24.71	10.01	168.8	183.4	239.4
30000	24.36	9.66	166.6	181.7	238.5
35000	23.69	8.99	162.2	178.7	236.9
40000	23.09	8.39	158.0	175.9	235.5
45000	22.62	7.92	154.6	173.4	234.3
50000	22.20	7.50	151.3	171.2	233.3
55000	21.83	7.13	148.2	169.2	232.4
60000	21.55	6.85	145.9	167.5	231.7
65000	21.32	6.62	143.8	166.0	231.2
70000	21.10	6.40	141.8	164.8	230.6
75000	20.92	6.22	140.1	163.6	230.2
80000	20.76	6.06	138.6	162.6	229.8
85000	20.62	5.92	137.2	161.8	229.5
90000	20.50	5.80	136.0	161.0	229.2
95000	20.41	5.71	135.0	160.3	228.9
100000	20.32	5.62	134.1	159.7	228.7
125000	19.95	5.25	130.1	157.3	227.8
150000	19.62	4.92	126.3	155.2	226.8
175000	19.31	4.61	122.5	153.1	225.9
200000	19.10	4.40	119.8	151.4	225.3
225000	18.86	4.16	117.6	150.1	224.5
250000	18.72	4.02	115.6	148.8	222.6
275000	18.70	4.00	115.9	147.0	218.3
300000	18.68	3.98	115.6	145.6	215.0
400000	18.53	3.83	112.9	140.8	202.1
500000	18.47	3.77	112.0	137.5	193.4
600000	18.44	3.74	112.3	135.1	187.1
700000	18.43	3.73	112.2	132.8	181.0
800000	18.38	3.68	111.5	131.6	177.8
900000	18.36	3.66	111.2	130.5	174.6
1000000	18.34	3.64	110.9	129.4	171.5
1250000	18.31	3.61	110.5	127.8	167.4
1500000	18.30	3.60	110.1	126.6	164.1
1750000	18.27	3.57	109.9	125.4	160.7
2000000	18.25	3.55	109.6	124.2	157.4
2500000	18.21	3.51	109.0	121.8	150.7
3000000	18.19	3.49	108.8	120.6	147.5
3500000	18.19	3.49	108.5	119.8	145.2
4000000	18.18	3.48	108.3	118.9	142.8
5000000	18.17	3.47	107.9	117.2	138.1
6000000	18.15	3.45	107.5	115.4	133.4
7000000	18.15	3.45	107.3	114.7	131.5
8000000	18.14	3.44	107.1	114.1	129.8
9000050	18.14	3.44	107.0	113.4	128.0
10000050	18.13	3.43	106.8	112.8	126.3

* COPATTA does not calculate and display a vessel water temperature until start of vessel boil-off calculations @ end of initial blowdown (12.2 seconds for Case 9)
COPATTA run I/O file: .case9lca.dat/.lis

lcarslts.wb2

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

10 COPATTA MASS & ENERGY BALANCE TABLES

Mass and energy balances are provided for the bounding LOCA at each break location. These bounding breaks are all with a LOP and diesel generator single failure.

10.1 DEDLS Break LOCA w/DG Failure

Table 10.1-1
Mass Balance Table for Case 1
Double Ended Discharge Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)					
	14.8 [a]	267 [b]	311 [c]	2440 [d]	85000 [e]	1 E7 [f]
PROGRAM INPUTS (lb_m)						
Initial Steam	567	567	567	567	567	567
Initial Air	179660	179660	179660	179660	179660	179660
Break Flow (CS 301)	501167	607363	614448	614448	614448	614448
ECCS Spillage (CS 601)	53204	362934	388910	465791	465791	465791
Containment Spray Flow (CS 801)	0	47778	57502	526945	526945	526945
Pumped SI Flow (CS 801)	0	0	0	1678490	1678490	1678490
SIT N2 (Air) Addition (CS 901)	0	3576	3576	3576	3576	3576
Reactor Vessel Water	0	0	195830	195830	195830	195830
Total Program Input	734598	1201877	1440493	3665307	3665307	3665307
PROGRAM INVENTORY (lb_m)						
Steam	194959	213827	211705	76136	40019	7456
Air	179660	183236	183236	183236	183236	183236
Sump Water	359981	804815	851163	3208720	3249560	3274000
Rx Vessel Water	0	0	194996	197205	192387	199885
Total Program Inventory	734600	1201878	1441100	3665297	3665202	3664570
Program Inventory minus Program Input (lb_m)	+ 2	+ 1	+ 607	- 10	- 105	- 730
Percent Difference with respect to Program Input	+ 0.0003	+ 0.0001	+ 0.0421	- 0.0003	- 0.0029	- 0.0199

Notes:
(a) End of initial RCS blowdown.
(b) Time of peak containment pressure.
(c) End of Post-Reflood and start of COPATTA reactor vessel boil-off calculations; rx. vessel mass initialized with 195830 lb_m water @ ~ 293°F (262.5 Btu/lb_m).
(d) Sump water recirculation begins at 2437 seconds; mass balance from computer output edit @ 2440 seconds.
(e) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).
(f) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).

Table 10.1-2
Energy Balance Table for Case 1
Double Ended Discharge Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)					
	14.8 [a]	267 [b]	311 [c]	2440 [d]	85000 [e]	1 E7 [f]
PROGRAM INPUTS (million Btu) [g]						
Initial Steam	0.596	0.596	0.596	0.596	0.596	0.596
Initial Air	17.808	17.808	17.808	17.808	17.808	17.808
Break Flow (CS 301)	306.191	437.057	445.422	445.422	445.422	445.422
ECCS Spillage (CS 601)	4.779	39.934	46.712	53.038	53.038	53.038
Containment Spray Flow (CS 801)	0	3.249	3.910	35.829	35.829	35.829
Pumped SI Flow (CS 801)	0	0	0	114.125	114.125	114.125
SIT N2 (Air) Addition (CS 901)	0	0.500	0.500	0.500	0.500	0.500
Reactor Vessel Water	0	0	51.405	51.405	51.405	51.405
RCS Sensible Heat	0	1.515	1.515	31.016	78.077	120.434
Core Decay Heat	0	0	0	158.427	2425.94	51135.5
Total Program Input	329.520	500.659	567.868	908.166	3222.740	51974.657
PROGRAM INVENTORY (million Btu) [g]						
Steam	212.553	233.449	231.098	81.935	42.691	7.803
Air	22.092	22.733	22.708	20.861	19.863	17.819
Sump Water	71.423	137.307	148.650	576.851	501.652	285.340
Rx Vessel Water	0	0	51.186	29.712	40.404	22.042
Structural Heat Sinks	23.413	103.021	109.057	159.344	381.511	89.167
ECU Energy Removal	0	4.129	5.036	37.084	790.104	4152.06
Recirculation (spray) Heat Exchanger	0	0	0	0.097	1450.32	47437.5
Total Program Inventory	329.481	500.639	567.735	905.884	3226.547	52011.731
Program Inventory minus Program Input (million Btu)	- 0.039	- 0.020	- 0.113	- 2.282	+ 3.807	+ 37.074
Percent Difference with respect to Program Input	- 0.0119	- 0.0040	- 0.0234	- 0.2513	+ 0.1181	+ 0.0713

Notes:
(a) End of initial RCS blowdown.
(b) Time of peak containment pressure.
(c) End of Post-Reflood and start of COPATTA reactor vessel boil-off calculations; rx. vessel mass initialized with 195830 lb_m water @ ~ 293°F (262.5 Btu/lb_m).

(d) Sump water recirculation begins at 2437 seconds; energy balance from computer output edit @ 2440 seconds.
(e) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).
(f) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).
(g) Reference temperatures for energies are 32°F for water and steam, 0°R for air, and 120°F for structural heat sinks.

10.2 DESLS Break LOCA w/DG Failure

Table 10.2-1
Mass Balance Table for Case 4
Double Ended Suction Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)					
	18.4 [a]	152 [b]	254 [c]	2440 [d]	85000 [e]	1 E7 [f]
PROGRAM INPUTS (lb_m)						
Initial Steam	567	567	567	567	567	567
Initial Air	179660	179660	179660	179660	179660	179660
Break Flow (CS 301)	469275	531135	549416	549416	549416	549416
ECCS Spillage (CS 601)	0	329876	377075	379237	379237	379237
Containment Spray Flow (CS 801)	0	22360	44904	526945	526945	526945
Pumped SI Flow (CS 801)	0	0	0	1796970	1796970	1796970
SIT N2 (Air) Addition (CS 901)	0	3576	3576	3576	3576	3576
Reactor Vessel Water	0	0	195830	195830	195830	195830
Total Program Input	649502	1067174	1351028	3632201	3632201	3632201
PROGRAM INVENTORY (lb_m)						
Steam	190675	192611	187272	66109	38938	7458
Air	179660	183236	183236	183236	183236	183236
Sump Water	279192	691349	791501	3185410	3217540	3240070
Rx Vessel Water	0	0	189609	197489	192432	200055
Total Program Inventory	649527	1067196	1351618	3632244	3632146	3630819
Program Inventory minus Program Input (lb_m)	+ 25	+ 22	+ 590	+ 43	- 55	- 1382
Per Cent Difference with respect to Program Input	+ 0.0038	+ 0.0021	+ 0.0437	- 0.0012	- 0.0015	- 0.0380

Notes:
(a) End of initial RCS blowdown.
(b) Time of peak containment pressure.
(c) End of Post-Reflood and start of COPATTA reactor vessel boil-off calculations; rx. vessel mass initialized with 195830 lb_m water @ ~ 287°F (256.4 Btu/lb_m).
(d) Sump water recirculation begins at 2437 seconds; mass balance from computer output edit @ 2440 seconds.
(e) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).

(f) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).

Table 10.2-2
Energy Balance Table for Case 4
Double Ended Suction Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)					
	18.4 [a]	152 [b]	254 [c]	2440 [d]	85000 [e]	1 E7 [f]
PROGRAM INPUTS (million Btu) [g]						
Initial Steam	0.596	0.596	0.596	0.596	0.596	0.596
Initial Air	17.808	17.808	17.808	17.808	17.808	17.808
Break Flow (CS 301)	295.115	370.507	392.866	392.866	392.866	392.866
ECCS Spillage (CS 601)	0	37.241	50.107	50.697	50.697	50.697
Containment Spray Flow (CS 801)	0	1.520	3.053	35.829	35.829	35.829
Pumped SI Flow (CS 801)	0	0	0	122.181	122.181	122.181
SIT N2 (Air) Addition (CS 901)	0	0.500	0.500	0.500	0.500	0.500
Reactor Vessel Water	0	0	50.211	50.211	50.211	50.211
RCS Sensible Heat	0	1.296	1.515	34.644	111.430	167.796
Core Decay Heat	0	0	0	164.771	2432.38	51141.8
Total Program Input	313.519	429.468	516.656	870.103	3214.498	51980.284
PROGRAM INVENTORY (million Btu) [g]						
Steam	207.821	209.964	204.063	71.003	41.523	7.804
Air	22.058	22.521	22.461	20.630	19.823	17.819
Sump Water	60.375	116.056	141.003	568.910	502.038	282.385
Rx Vessel Water	0	0	48.591	28.962	40.318	21.482
Structural Heat Sinks	23.429	79.132	96.844	146.665	375.030	76.847
ECU Energy Removal	0	1.770	3.748	33.794	773.533	3960.11
Recirculation (spray) Heat Exchanger	0	0	0	0.096	1468.42	47653.6
Total Program Inventory	313.683	429.443	516.710	870.060	3220.685	52020.047
Program Inventory minus Program Input (million Btu)	+ 0.164	- 0.025	+ 0.054	- 0.043	+ 6.187	+ 39.763
Percent Difference with respect to Program Input	+ 0.0523	- 0.0058	+ 0.0105	- 0.0049	+ 0.1925	+ 0.0765

Notes:
(a) End of initial RCS blowdown.
(b) Time of peak containment pressure.
(c) End of Post-Reflood and start of COPATTA reactor vessel boil-off calculations; rx. vessel mass initialized with 195830 lb_m water @ ~ 287°F (256.4 Btu/lb_m).

(d) Sump water recirculation begins at 2437 seconds; energy balance from computer output edit @ 2440 seconds.
(e) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).
(f) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).
(g) Reference temperatures for energies are 32°F for water and steam, 0°R for air, and 120°F for structural heat sinks.

10.3 DEHLS Break LOCA w/DG Failure

Table 10.3-1
Mass Balance Table for Case 7
Double Ended Hot Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)			
	12.2 [a]	2400 [b]	85000 [c]	1 E7 [d]
PROGRAM INPUTS (lb_m)				
Initial Steam	567	567	567	567
Initial Air	179660	179660	179660	179660
Break Flow (CS 301)	464976	464976	464976	464976
ECCS Spillage (CS 601)	0	0	0	0
Containment Spray Flow (CS 801)	0	519210	519210	519210
Pumped SI Flow (CS 801)	0	1967630	1967630	1967360
SIT N2 (Air) Addition (CS 901)	0	3576	3576	3576
Reactor Vessel Water	0	172061	172061	172061
Total Program Input	645203	3307680	3307680	3307680
PROGRAM INVENTORY (lb_m)				
Steam	214862	53354	43796	7476
Air	179660	183236	183236	183236
Sump Water	250808	2873230	2888090	2920230
Rx Vessel Water	0	197625	192295	198799
Total Program Inventory	645330	3307445	3307417	3309741
Program Inventory minus Program Input (lb_m)	+ 127	- 235	- 263	+ 2061
Per Cent Difference with respect to Program Input	+ 0.0197	- 0.0071	- 0.0080	+ 0.0623

Notes:

(a) End of initial RCS blowdown and approximately 1.2 seconds after containment peak pressure. Start of COPATTA reactor vessel boil-off calculations. Reactor vessel mass initialized with 172061 lb_m water @ ~293°F (262.5 Btu/lb_m).

(b) Sump water recirculation begins at 2401 seconds; mass balance from computer output edit @ 2400 seconds.

(c) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).

(d) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).

Table 10.3-2
Energy Balance Table for Case 7
Double Ended Hot Leg Slot Break LOCA w/Diesel Generator Failure

	ELAPSED TIME FOLLOWING LOCA (SECONDS)			
	12.2 [a]	2400 [b]	85000 [c]	1 E7 [d]
PROGRAM INPUTS (million Btu) [e]				
Initial Steam	0.596	0.596	0.596	0.596
Initial Air	17.808	17.808	17.808	17.808
Break Flow (CS 301)	312.597	312.597	312.597	312.597
ECCS Spillage (CS 601)	0	0	0	0
Containment Spray Flow (CS 801)	0	35.303	35.303	35.303
Pumped SI Flow (CS 801)	0	133.766	133.766	133.766
SIT N2 (Air) Addition (CS 901)	0	0.500	0.500	0.500
Reactor Vessel Water	0	45.166	45.166	45.166
RCS Sensible Heat	1.515	43.241	49.651	54.854
Core Decay Heat	0	198.397	2468.31	51177.7
Total Program Input	332.516	787.374	3063.627	51778.220
PROGRAM INVENTORY (million Btu) [g]				
Steam	234694	57.134	46.773	7.824
Air	22.333	20.306	19.996	17.819
Sump Water	54.477	520.025	426.827	254.498
Rx Vessel Water	0	28.591	40.662	25.369
Structural Heat Sinks	21.139	131.789	390.973	173.509
ECU Energy Removal	0	29.483	790.865	5493.93
Recirculation (spray) Heat Exchanger	0	0	1352.44	45836.7
Total Program Inventory	332.643	787.328	3068.536	51809.649
Program Inventory minus Program Input (million Btu)	+ 0.127	- 0.046	+ 4.909	+ 31.429
Percent Difference with respect to Program Input	+ 0.0382	- 0.0058	+ 0.1602	+ 0.0607

Notes:

(a) End of initial RCS blowdown and approximately 1.2 seconds after containment peak pressure. Start of COPATTA reactor vessel boil-off calculations. Reactor vessel mass initialized with 172061 lb_m water @ ~293°F (262.5 Btu/lb_m).

(b) Sump water recirculation begins at 2401 seconds; energy balance from computer output edit @ 2400 seconds.

(c) The time of 85000 seconds is the computer output edit closest to 1 day post-LOCA (86400 seconds).

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

(d) The time of 1E7 seconds corresponds to the end of the COPATTA analysis (actual end time = 1.000005E7 seconds, or 115.74 days post-LOCA).

(e) Reference temperatures for energies are 32°F for water and steam, 0°R for air, and 120°F for structural heat sinks.

APPENDIX A
COPATTA I/O FILE INFORMATION

A total of 9 COPATTA runs were made for this calculation. The input data files for these runs are provided in Section 8.3 of the calculation. All COPATTA runs were performed on the NFM RISC 6000 Workstation device number D037571. The output files have been archived on the NFM CDROM system as calculation type nfm23pt. COPATTA run and CDROM archive identification data appear in the table below.

Case Description and Output File Name	Run Calendar Data		NFM CDROM Information		
	Date	Time	Archive Date	File Size	Checksum
CASE 1: DEDLS w/LOP & DG Failure (min SI); 2 ECUs & 1 CS Output File Name: case1lca.lis	11/23/99	17:42:28	12/17/99	1971787	37641
CASE 2: DEDLS w/LOP & No DG Failure (max SI); 4 ECUs & 1 CS Output File Name: case2lca.lis	11/30/99	08:11:57	12/17/99	1979994	00005
CASE 3: DEDLS w/LOP & No DG Failure (max SI); 2 ECUs & 2 CS Output File Name: case3lca.lis	11/30/99	08:21:56	12/17/99	1982556	57906
CASE 4: DESLS w/LOP & DG Failure (min SI); 2 ECUs & 1 CS Output File Name: case4lca.lis	11/23/99	17:53:23	12/17/99	1972141	12317
CASE 5: DESLS w/LOP & No DG Failure (max SI); 4 ECUs & 1 CS Output File Name: case5lca.lis	11/24/99	08:40:18	12/17/99	1979945	32809
CASE 6: DESLS w/LOP & No DG Failure (max SI); 2 ECUs & 2 CS Output File Name: case6lca.lis	11/24/99	09:11:01	12/17/99	1982455	24130
CASE 7: DEHLS w/LOP & DG Failure (min SI); 2 ECUs & 1 CS Output File Name: case7lca.lis	11/23/99	18:17:17	12/17/99	1965507	55246
CASE 8: DEHLS w/LOP & No DG Failure (max SI); 4 ECUs & 1 CS Output File Name: case8lca.lis	11/24/99	08:01:49	12/17/99	1973717	54703
CASE 9: DEHLS w/LOP & No DG Failure (max SI); 2 ECUs & 2 CS Output File Name: case9lca.lis	11/24/99	08:06:29	12/17/99	1976227	64002

APPENDIX B
REACTOR CORE DECAY HEAT CALCULATION

The following table summarizes the results of the decay heat spreadsheet calculation. The second page of this appendix shows the Decay Heat Calculator displaying the results of the calculation for a shutdown time of 10 seconds. The program was run by setting all the input parameters and then sequentially specifying the desired shutdown time from 10 seconds out to 10.368 E6 seconds. The program was run with the reactor at 100% power, and the final total decay heat power for the full 217 element core includes a multiplying factor of 1.02 to obtain the decay heat with the reactor at 102% power.

SUMMARY OF DECAY HEAT RESULTS

				Comparison With N-1020-043, R0		
Shutdown Time (seconds)	P/Po	Single FA DH @ 100% (Btu/hr)	Total Decay Heat @ 102% (Btu/hr)	Single FA DH @ 100% (Btu/hr)	Delta Decay Heat @ 100% (Btu/hr)	Percent Difference vs N-1020
10	0.119197	6.3553E+06	1.40669E+09	n/a	-	-
20	0.084371	4.4985E+06	9.95691E+08	n/a	-	-
30	0.066524	3.5469E+06	7.85072E+08	3.55E+06	-3100	-0.087
60	0.048772	2.6004E+06	5.75572E+08	2.60E+06	400	0.015
100	0.043100	2.2980E+06	5.08637E+08	n/a	-	-
200	0.036480	1.9450E+06	4.30510E+08	n/a	-	-
400	0.030351	1.6182E+06	3.58179E+08	n/a	-	-
1000	0.023117	1.2326E+06	2.72813E+08	n/a	-	-
1800	0.019971	1.0648E+06	2.35686E+08	1.06E+06	4800	0.453
2700	0.017547	9.3558E+05	2.07082E+08	n/a	-	-
3600	0.015877	8.4655E+05	1.87376E+08	8.46E+05	550	0.065
7200	0.012730	6.7872E+05	1.50229E+08	n/a	-	-
18000	0.010027	5.3463E+05	1.18335E+08	5.34E+05	630	0.118
36000	0.007978	4.2536E+05	9.41483E+07	4.25E+05	360	0.085
54000	0.006957	3.7095E+05	8.21067E+07	3.71E+05	-50	-0.013
72000	0.006381	3.4022E+05	7.53054E+07	3.40E+05	220	0.065
86400	0.006069	3.2357E+05	7.16199E+07	3.23E+05	570	0.176
172800	0.004984	2.6575E+05	5.88206E+07	2.66E+05	-250	-0.094
259200	0.004305	2.2951E+05	5.08008E+07	2.29E+05	510	0.223
432000	0.003475	1.8528E+05	4.10087E+07	1.85E+05	280	0.151
691200	0.002859	1.5241E+05	3.37355E+07	1.52E+05	410	0.270
1036800	0.002452	1.3073E+05	2.89365E+07	1.31E+05	-270	-0.206
2592000	0.001665	8.8768E+04	1.96478E+07	8.87E+04	68	0.077
6048000	0.001054	5.6208E+04	1.24410E+07	5.62E+04	8	0.014
10368000	0.000775	4.1311E+04	9.14378E+06	4.13E+04	11	0.027
					Sigma % Diff.	1.338
					Avg. % Diff	0.079

E&TS DEPARTMENT

CALCULATION SHEET

ICCN NO./ PRELIM. CCN NO.	PAGE___ OF___
	CCN CONVERSION: CCN NO. CCN --

Project or DCP/FCN SONGS 2 & 3 **Calc. No.** N-4080-026

Subject Containment P/T Analysis for Design Basis LOCA Events **Sheet No.** 245 of 248

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

Decay Heat Calculator

Input				*Constants*					
Operating Time (t0, sec) =		1.26E+08	4 EFP yr	A1	=	0.5980	a1	=	1.7720E+00
Shutdown Time (ts, sec) =		10		A2	=	1.6500	a2	=	5.7740E-01
Initial Power (MW) =		15.622	100% pwr	A3	=	3.1000	a3	=	6.7430E-02
				A4	=	3.8700	a4	=	6.2140E-03
Fission Product Fraction				A5	=	2.3300	a5	=	4.7390E-04
P/P0(inf,ts) =	0.0500			A6	=	1.2900	a6	=	4.8100E-05
P/P0(t0,ts) =	0.0594			A7	=	0.4620	a7	=	5.3440E-06
				A8	=	0.3280	a8	=	5.7160E-07
Heavy Element Fraction				A9	=	0.1700	a9	=	1.0360E-07
P/P0(U-239) =	0.0016			A10	=	0.0865	a10	=	2.9590E-08
P/P0(Np-239) =	0.0015			A11	=	0.1140	a11	=	7.5850E-10
Delayed Neutron Fission Fraction				K	=	0.2	(Fission product decay power uncertainty)		
P/P0(ts) =	0.0567			C	=	0.7			
Output				Beta	=	0.0065			
Fission Product Power (MW) =		9.2816E-01		L*	=	0.001			
Heavy Element Power (MW) =		4.8540E-02		Rho	=	-0.05			
Delayed Neutron Power (MW) =		8.8539E-01		Lmb	=	0.08			

Total Decay Heat (MW) =	**1.8621E+00**	**For one average fuel assembly**
Total Decay Heat (Btu/hr) =	**6.3553E+06**	**For one average fuel assembly**
P/Po	**0.119197**	
Total Decay Heat (Btu/hr) =	**1.40669E+09**	**For full core (217 elements) with reactor operation @ 102% power**

Notes:

1. Spreadsheet calculation based on N-1020-043, Rev. 0 which useds decay heat methodology from NRC Branch Technical Position ASB 9-2 plus short-term delayed neutron fission energy.
2. Fission product decay power uncertainty (K) equals 0.2 for shutdown time < 1000 seconds and equals 0.1 for shutdown times =/> than 1000 seconds.

LOCAMEF.WB2

APPENDIX C
SAFETY INJECTION TANK NITROGEN ADDITION

The contribution of safety injection tank nitrogen to containment pressurization following large break LOCA events is included in the COPATTA containment analysis. A table of nitrogen flowrate as a function of time is included in the COPATTA input file beginning at a time when the SI tanks are calculated to be empty of borated water.

A. ABB-CE provided a table for nitrogen addition in table 23 of Reference 6.2a. The table is discussed in Calculation #5 as based on a previous analysis for the Waterford 3 nuclear power plant, and shown as table 7 in Section V of Reference 6.2d. This table is presented below:

NITROGEN ADDITION TO CONTAINMENT FROM SI TANKS

Time (sec)	Mass Release Rate (lbm/sec)	Temperature (F)	Mass Integral (lbm)
0.000	0.00	120	0.00
91.750	0.00	120	0.00
91.755	253.96	120	0.63
92.250	228.82	120	120.12
92.750	204.66	120	228.49
93.250	181.61	120	325.06
93.750	159.50	120	410.34
94.250	138.21	120	484.77
94.750	117.62	120	548.72
95.250	97.61	120	602.53
95.750	78.01	120	646.44
96.250	58.67	120	680.61
96.750	39.39	120	705.12
97.250	19.67	120	719.89
97.750	0.00	120	724.80
1E+08	0.00	120	724.80

B. An alternative, more conservative, assessment of nitrogen addition from the SI tanks is described below.

1. INPUT DATA

		Reference
Number of SI Tanks	4	
Gross Volume of each SIT	2253.9 ft^3	6.2d (App. B)
Normal Liquid Volume in each SIT	1743.5 ft^3	6.2d (App. B)
Maximum Initial Gas Pressure	675 psia	6.2d (App. B)
Initial SIT Temperature	120°F	6.2d (App. B)
SIT Pressure @ Time of Peak Cont'm't Pressure	50 psig	assumed
Nitrogen Molecular Weight	28 lb_m/lb-mole	

2. CALCULATION OF INITIAL N_2 MASS IN 1 SIT

Use ideal gas law PV = nRT

P = absolute nitrogen pressure, psia
V = gas volume within SIT, ft^3
n = lb-moles of nitrogen
R = universal gas constant, 1545 ft lb_f / lb-mole R
T = nitrogen absolute temperature, degrees Rankine

m(i) = initial mass of N_2 = MW of N_2 x n = MW of N_2 x (PV)/(RT)
m(i) = 28 x [(675)(144in^2 / ft^2)(2253.9 - 1743.5)/(1545)(120 + 460)]
m(i) = 28 x 55.363 lb-moles = 1550.2 lb_m/SIT

3. CALCULATION OF FINAL N_2 MASS IN 1 SIT @ TIME OF PEAK CONTAINMENT PRESSURE .

Use same relationship from above, but:

a) assume gas temperature in SIT remains constant at 120F, although cooling due to gas expansion should occur

b) neglect gas volume of SI piping between SIT and RCS cold legs

m(f) = 28 x [(50 + 14.7)(144)(2253.9)/(1545)(120 + 460)]
m(f) = 28 x 23.434 lb-moles
m(f) = 656.2 lb_m/SIT

4. CALCULATION OF TOTAL N2 RELEASE TO TIME OF PEAK CONTAINMENT PRESSURE

m(total) = 4 x [m(i) - m(f)] = 4 x (1550.2 - 656.2)
m(total) = 4 x 894 = 3576 lb_m

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
1	P. Barbour	12/17/99	J.M. Gilmer	12/17/99						

Conclusion/Recommendation

The alternate (SCE) methodology adds about 5 times more nitrogen to containment than does the ABB-CE methodology. For conservatism, the SCE methodology will be utilized for the LOCA P-T calculations. Similar to the ABB-CE method, the nitrogen will be added over a 10 second period of time beginning at 90 seconds. This time is after the SI tanks have drained, but well before the time of peak containmentressure for the cold leg breaks, which are more limiting than the hot leg LOCA. For consistency, the nitrogen will also be added to the hot leg LOCA between 90 and 100 seconds. Nitrogen addition with the hot leg break is not really a factor since the peak containment pressure occurs during the initial blowdown of the RCS, before the SI tanks complete draining and any nitrogen has a chance to enter containment.

N_2 flow rate = (3576 lb_m/10 seconds) x (3600 sec/hr)
N_2 flow rate = 1.2874E+06 lb_m/hr

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

APPENDIX D
EVALUATION OF IMPACT OF REDUCED CCW FLOW TO CONTAINMENT ECUs ON POST-LOCA LONG-TERM CONTAINMENT COOLDOWN

D.1 Purpose

Evaluate the impact of degraded emergency air cooling unit (ECU) heat transfer capability, caused by a reduction in component cooling water (CCW) flow to the ECUs, on the long-term post-LOCA cooldown of containment. The evaluation considers a 6% reduction in ECU heat removal rates when the Spent Fuel Pool Heat Exchanger (SFPHX) is connected to the operating CCW system, and the CCW flow rate to each ECU is reduced from the design basis value of 2000 gpm to a minimum value of 1700 gpm.

D.2 Introduction and Background

AR 991001180 has identified that CCW flow to the containment Emergency Air Cooling Units (ECUs) may by as low as 1700 gpm during post-LOCA long-term containment cooldown. The decrease in ECU cooling water flow below the design basis value of 2000 gpm occurs when the non-critical CCW loop is re-connected to the operating CCW train critical loop to restore cooling to the Spent Fuel Pool Heat Exchanger (SFPHX). Calculation Change Notice CCN 1 to Calculation M-0072-036 (Ref. D.1) quantifies the reduction in ECU performance to be 5.1% with the containment at 280°F and 4.2% with the containment at 200°F. Assignment 9 of the AR requests Calculation N-4080-026, Revision 1 (containment post-LOCA P-T analysis), be updated to account for a 6% reduction in ECU perfomance, reflecting the potential low CCW flow to the ECUs.

Calculation N-4080-026 currently includes a 2% ECU performance degradation allowance to cover potential CCW flows as low as 1900 gpm to the ECUs. The issue of concern is the impact of an additional 4% degradation in ECU performance on long-term containment cooldown following a design basis LOCA event. A slower containment cooldown may adversely impact the qualification status of electrical equipment and components inside containment which are required to remain operable for the duration of the event. It is emphasized that the ECU flow reduction issue has absolutely no impact on short-term containment peak pressures and temperatures calculated in the current analysis. The reduced CCW flow to the ECUs occurs only after the SFPHX is realigned to the CCW system, well after the short-term peak post-accident containment conditions have occurred.

D.3 Summary of Results and Conclusions

It is the conclusion of the evaluation in this Appendix that the long-term containment cooldown results presented in Revision 1 of this calculation, which are based on an ECU performance equal to 98% of the design basis values defined in Revision 0 to M-0072-036 [Ref. D.1, w/o CCN 1], may be considered to remain bounding, even with CCW flow to the ECUs as low as 1700 gpm versus the design basis flow rate of 2000 gpm per ECU. This conclusion is supported by the discussion of results provided below.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

Figures D-1 and D-2 show the containment pressures and temperatures, respectively, for the design basis DEDLS LOCA from the current analysis of record (with 2% ECU degradation) and the results from a second COPATTA analysis using 6% ECU degradation. Figures D-3 and D-4 show the same kind of information for the design basis DEHLS LOCA event. The curves of containment conditions with 6% ECU degradation fall virtually on top of the current AOR cases with discernable increases only appearing after several thousand seconds (1 to 2 hours) into the event. These analyses are conservative since they model the degraded ECU performance beginning at the start of the event whereas the degradation in performance would actually occur only after operator re-alignment of the SFPHX several hours post-LOCA. Inspection of the actual COPATTA results show a maximum increase in containment pressure of about 0.4 psig at about 5 to 7 hours post-LOCA when the pressures are in the range of 20 to 25 psig and decreasing. The results also show a maximum increase in containment vapor temperature of about 1.2°F and containment sump water temperature of about 0.9°F occurring approximately 8 to 12 hours post-LOCA. After reaching these maximum differences, containment pressures and temperatures gradually decrease and approach the values calculated in the current AOR. These changes in containment conditions are not considered to be significant considering the uncertainties inherent in the long-term modeling of containment post-LOCA performance.

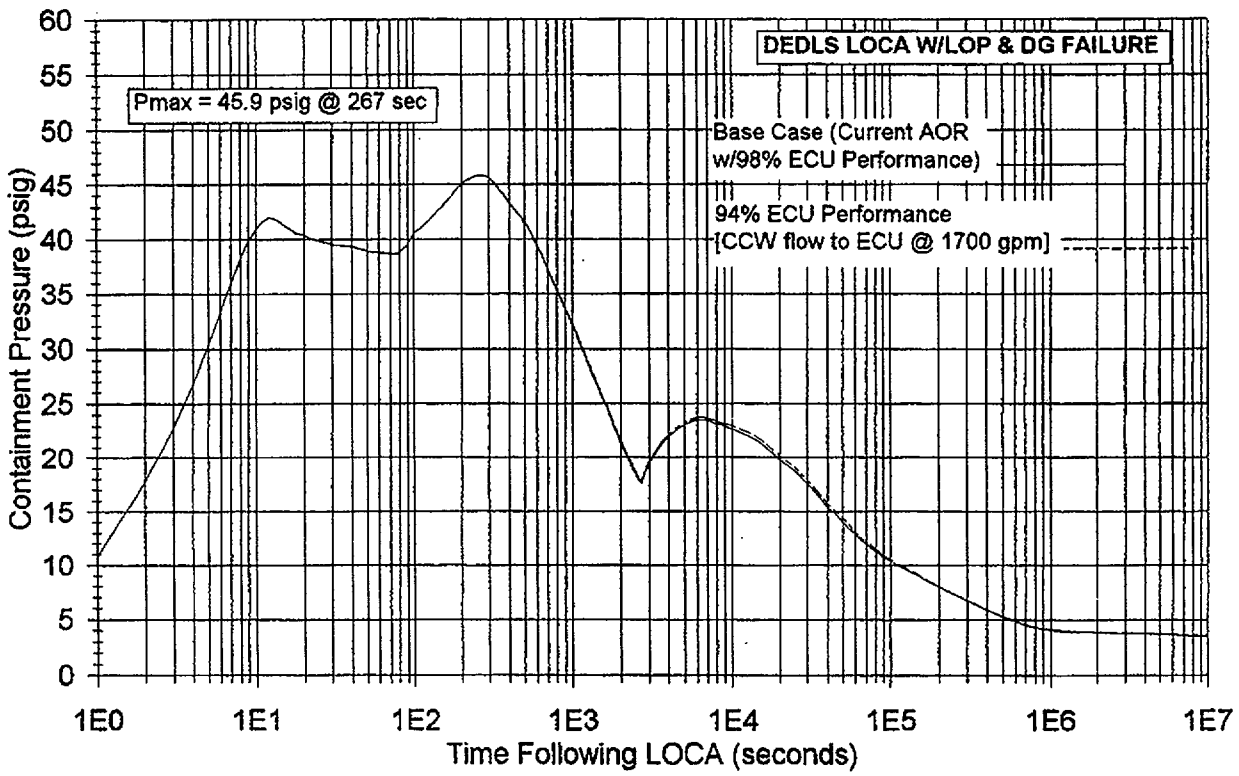
A significant conservatism is included in the containment post-LOCA response analyses which provides further support for considering the current AOR as definitive and bounding for the long-term containment response. The containment analysis assumes the temperature of the cooling water supplied by the CCW system remains constant at the design basis maximum value of 105°F throughout the event. In reality, the CCW temperature would be substantially less than this maximum value at the start of the event and not approach 105°F until after sump water recirculation is initiated and cooling of the containment spray flow in the Shutdown Heat Exchanger (SDHX) begins. Then, as containment cooldown proceeds, the heat load from the ECUs and the SDHX gradually decreases and the CCW temperature also declines in response to the decrease in total CCW heat load.

Table 3-1 of DBD-SO23-400 (Ref. D.2) shows the peak post-LOCA heat load on one CCW system train is 151.44×10^6 Btu/hr, including 54.4×10^6 Btu/hr from one train of ECUs and 68.4×10^6 Btu/hr from one SDHX. The combined peak containment post-LOCA heat load is 122.8×10^6 Btu/hr, or 81% of the CCW heat load. Figures D-5 and D-6 present the ECU and SDHX heat loads on the CCW system taken from the current AOR COPATTA analysis results for the DBA cases 1 (DEDLS LOCA) and 7 (DEHLS LOCA), respectively. The DEDLS LOCA (Case 1) is more limiting with respect to heat load on the CCW system, yielding a peak combined ECU and SDHX heat load of 117×10^6 Btu/hr at about 7000 seconds (~ 2 hours post-LOCA). ***[Note: The total containment heat load in Reference D.2 is based on the previous containment LOCA P-T analysis in Supplement A to Revision 0 of this calculation, and is bounding with respect to the current AOR.]*** The important point to note is that the high design basis post-LOCA containment heat loads are relatively short-lived. At one day post-LOCA the containment heat load on the CCW system had decreased by 35% to about 76×10^6 Btu/hr. The substantial reduction in CCW heat load with time will result in a corresponding decrease in CCW temperature. Any reduction in CCW temperature will increase the effectiveness of the ECUs and the SDHX and increase the rate of containment depressurization and cooldown relative to that documented in the current AOR.

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-1

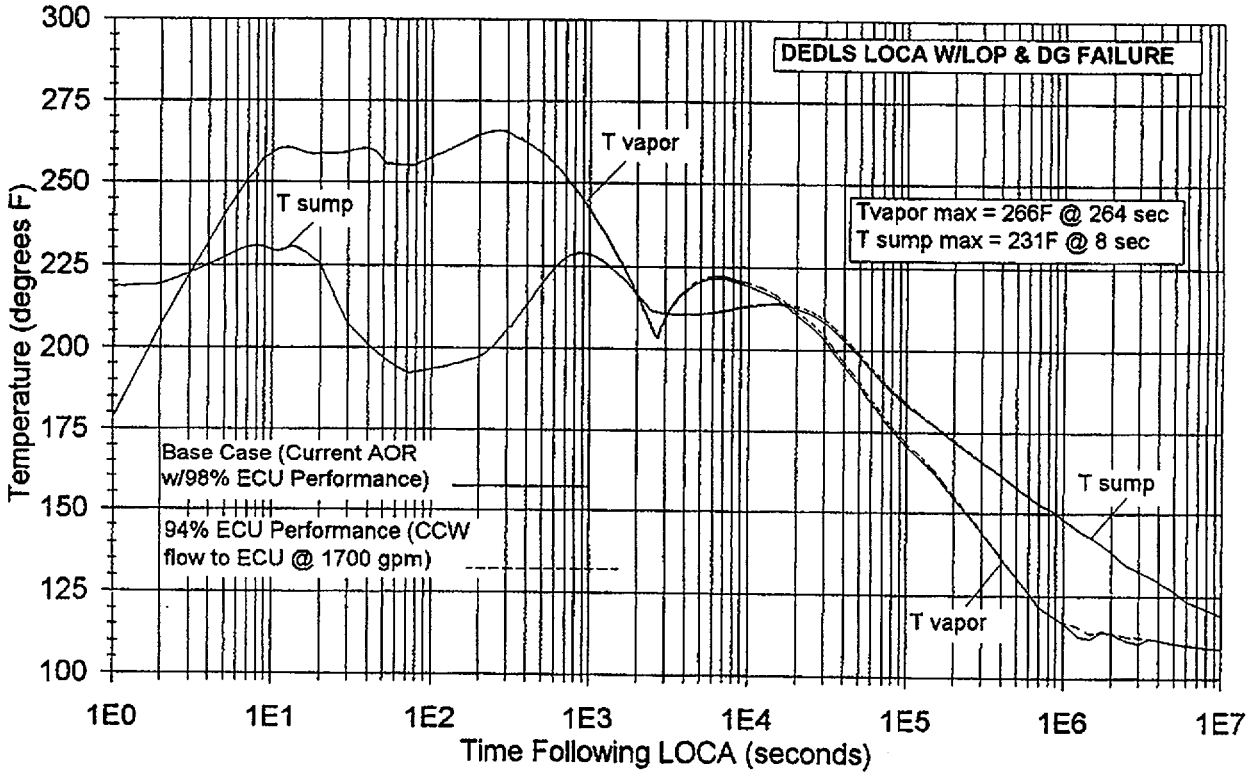
CASE 1 - DEDLS LOCA W/LOP & DG FAILURE CONTAINMENT PRESSURE



REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-2

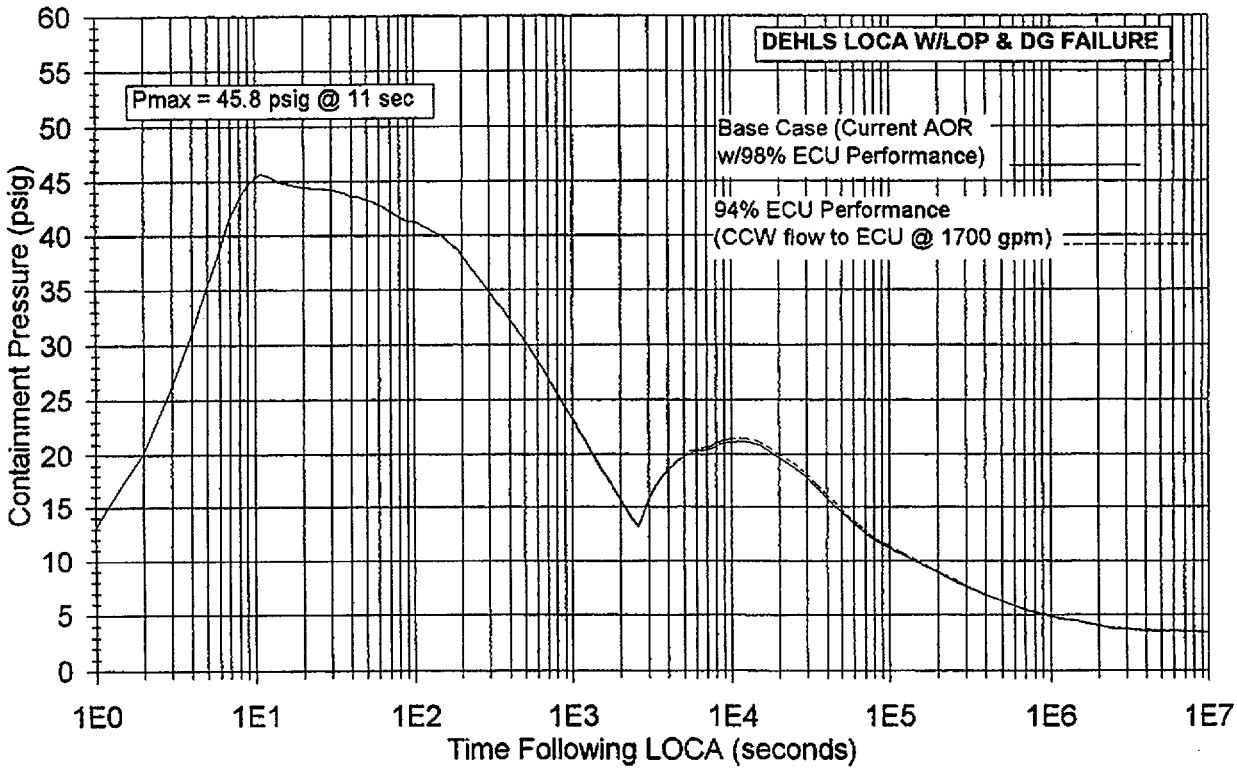
CASE 1 - DEDLS LOCA W/LOP & DG FAILURE CONTAINMENT TEMPERATURES



REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-3

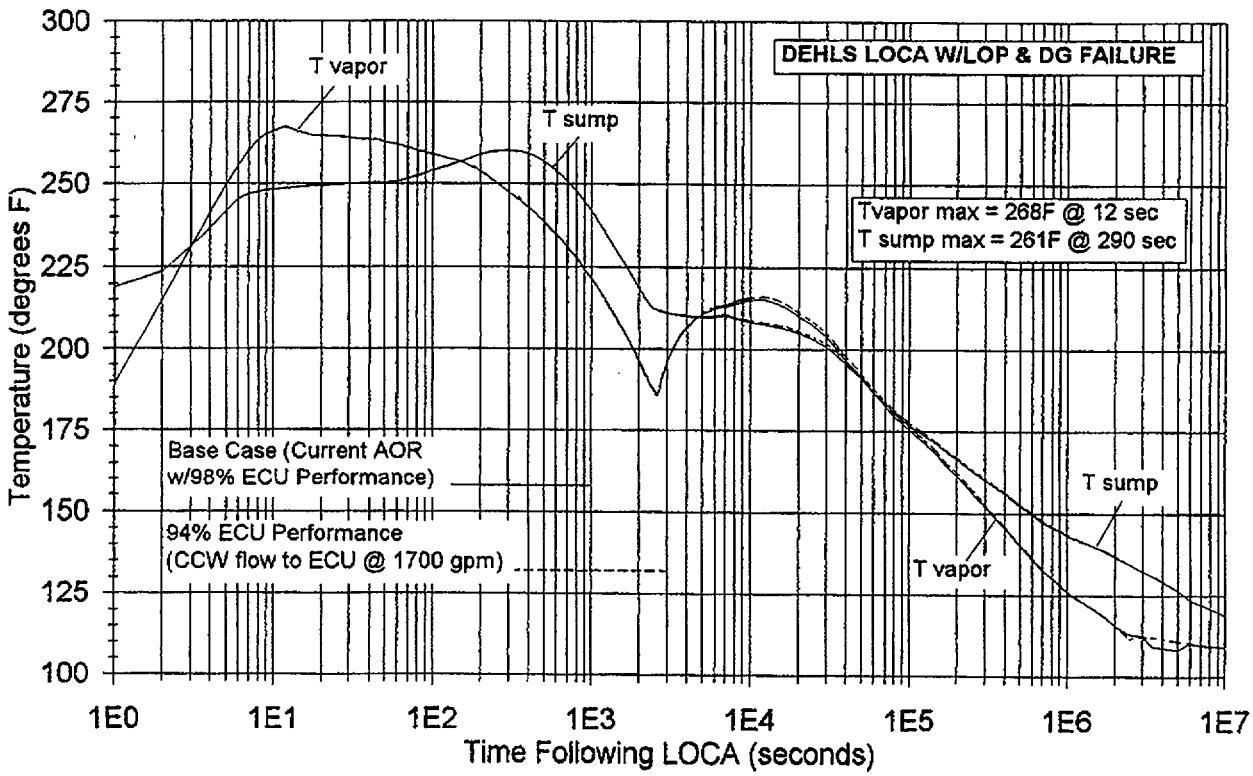
CASE 7 - DEHLS LOCA W/LOP & DG FAILURE
CONTAINMENT PRESSURE



REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-4

CASE 7 - DEHLS LOCA W/LOP & DG FAILURE CONTAINMENT TEMPERATURES

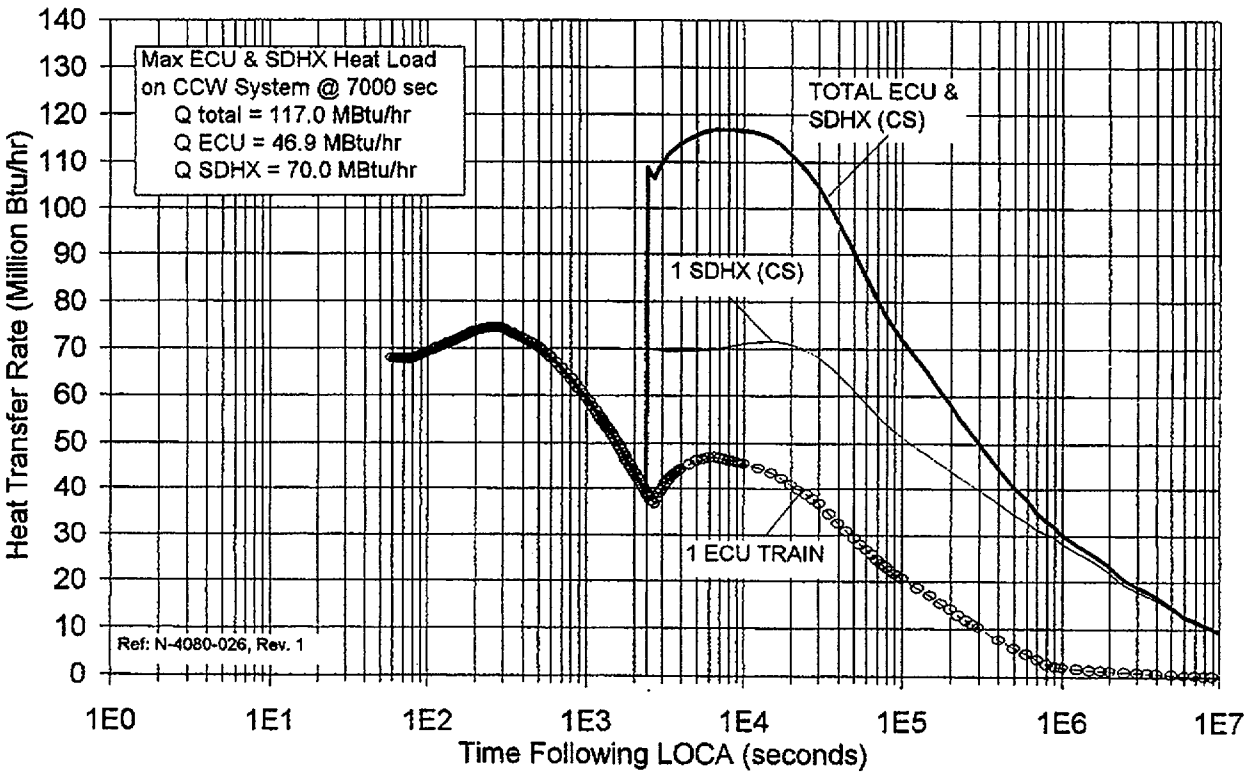


REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-5

ECU & SDHX (CS) HEAT LOADS ON CCW

DEDLS LOCA W/LOP & DG FAILURE - Case 1

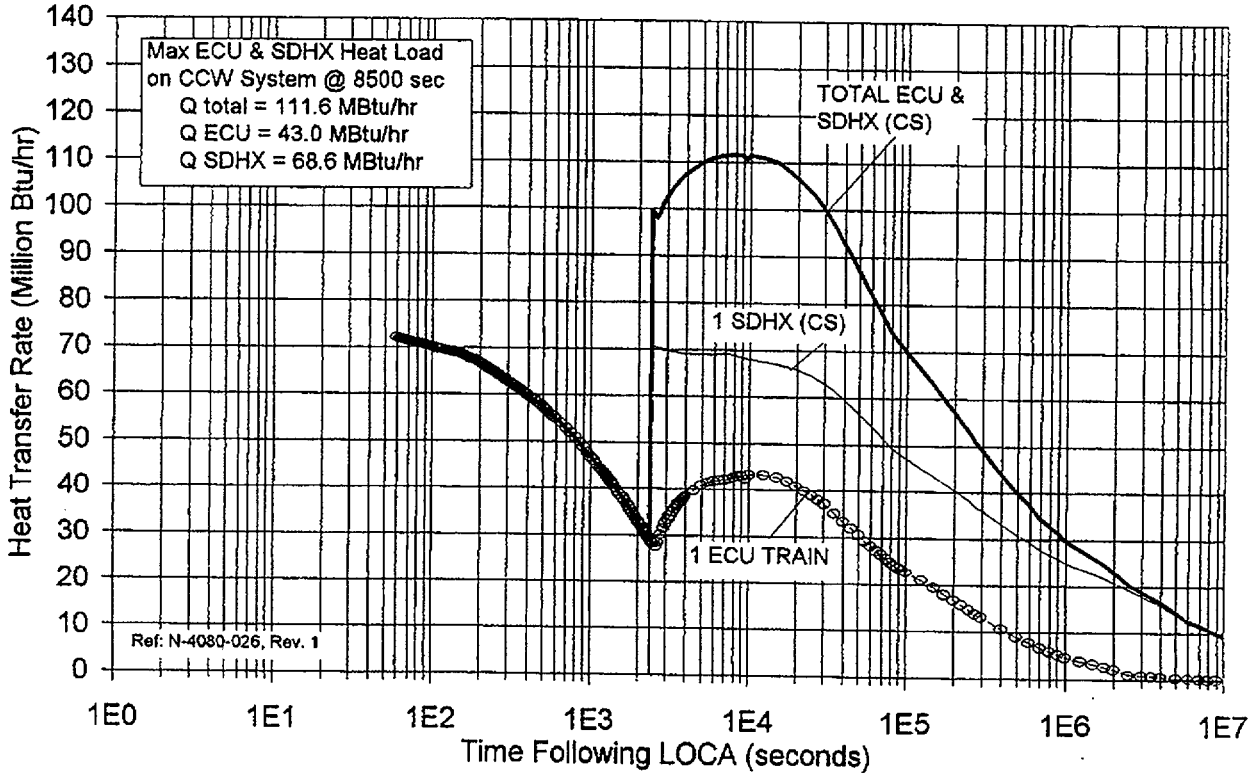


REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

FIGURE D-6

ECU & SDHX (CS) HEAT LOADS ON CCW

DEHLS LOCA W/LOP & DG FAILURE - Case 7



REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

D.4 Calculations

The input file for Case 1, the bounding DEDLS LOCA for peak pressure and for Case 7, the bounding DEHLS LOCA for long-term containment cooldown were edited to change the ECU performance table (COPATTA Card Series 1101) to provide heat removal rates equal to 94% of the design basis values provided in Table 1 of calculation M-0072-036, Revision 0 (internal fouling factor of 0.0005). The table below presents the design basis and 94% values used for this evaluation. The ECU heat transfer rates with 2% performance degradation used in the current containment post-LOCA P-T response AOR are shown on page 112 of this calculation.

Emergency Air Cooling Unit Performance

Vapor (saturation) Temperature (°F)	Single ECU Design Basis Heat Removal Rate (Btu/hr)	94% Design Basis ECU Heat Removal Rate (Btu/hr)
105	0	0
120	1.67E6	1.570E6
130	3.02E6	2.839E6
140	4.57E6	4.296E6
150	6.32E6	5.941E6
160	8.27E6	7.774E6
170	10.40E6	9.776E6
180	12.73E6	11.966E6
190	15.23E6	14.316E6
200	17.88E6	16.807E6
210	20.68E6	19.439E6
220	23.61E6	22.193E6
230	26.64E6	25.042E6
240	29.74E6	27.956E6
250	32.91E6	30.935E6
260	36.11E6	33.943E6
270	39.31E6	36.951E6
280	42.52E6	39.969E6
287	44.74E6	42.056E6
290	45.69E6	42.949E6
300	48.82E6	45.891E6

REV	ORIGINATOR	DATE	IRE	DATE	REV	ORIGINATOR	DATE	IRE	DATE	REV ⇓
	P. Barbour	3/26/01	M. I. Drucker	3/26/01						

D.5 References

D.1 CCN 1 to M-0072-036, Revision 0, "Containment Emergency Cooler Performance Verification", 5/30/2000

D.2 DBD-SO23-400, Revision 7, "Component Cooling Water System Design Basis Document", 9/30/00