

June 28, 2001
NG-01-0805

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station 0-P1-17
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Response to Request for Additional Information (RAI) to Technical
Specification Change Request TSCR-042 – Extended Power Uprate. (TAC
MB0543)

Reference: NG-01-0738, “Response to Request for Additional Information (RAI) to
Technical Specification Change Request TSCR-042 – Extended Power
Uprate. (TAC # MB0543),” dated June 5, 2001.

File: A-117, SPF-189

Dear Sir(s):

Subsequent to our submitting the referenced Response to Request for Additional Information (RAI), a conference call was held with the Staff on June 14, 2001 to discuss that previously-provided material. As a result of that conference call, additional information was requested so that the Staff can complete its confirmatory analysis. The Attachment to this letter contains the requested data.

No new commitments are being made in this letter.

Please contact this office should you require additional information regarding this matter.

This letter is true and accurate to the best of my knowledge and belief.

NUCLEAR MANAGEMENT COMPANY, LLC

By Keith D. Young for
Gary Van Middlesworth
DAEC Site Vice-President

State of Iowa
(County) of Linn

Signed and sworn to before me on this 28th day of June, 2001,

by Keith D. Young.

Nancy S. Franck
Notary Public in and for the State of Iowa



Commission Expires

Attachment: DAEC Response to NRC Containment Systems Branch Request for Additional Information Regarding Proposed Amendment for Power Uprate

cc: T. Browning
R. Anderson (NMC) (w/o Attachment)
B. Mozafari (NRC-NRR)
J. Dyer (Region III)
D. McGhee (State of Iowa)
NRC Resident Office
Docu

DAEC Response to NRC
Containment Systems Branch
Request for Additional Information
Regarding Proposed Amendment for Power Uprate

1. Provide the following input for the long-term computer calculations: Emergency Core Cooling System (ECCS) injection flowrate versus time and ECCS injection coolant enthalpy versus time.

DAEC Response:

See attached Table 1 for the requested data. The following Notes apply to that information.

1. For both the Core Spray (CS) and Low Pressure Coolant Injection (LPCI), the flow leaving the suppression pool (SP) either injects into the vessel or returns directly to the suppression pool; and, they are mutually exclusive. Thus, when the flow to the suppression pool is zero, it indicates that all flow is injected into the vessel. On the other hand, if the flow to the suppression pool is non-zero, it indicates that there is no injection flow to the vessel.
2. Before 600 seconds, CS and LPCI cycle between the low pressure ECCS initiation setpoint (Level 1 - Low, Low, Low Vessel Water Level) and the high level trip setpoint (Level 8 - High Vessel Water Level); i.e., they activate upon reactor water level reaching Level 1 and shut off upon reactor water level reaching Level 8, in this model. (Note: in reality, the Level 1 initiation is an automatic function, but the shut off at Level 8 is a manual operator action for CS and LPCI pumps.)
3. After 600 seconds, the operator shuts off one LPCI pump in order to begin suppression pool cooling, as the emergency diesel generator loading must be reduced to allow the Residual Heat Removal (RHR) Service Water pumps to be placed into service (assuming the loss of offsite power). The flowpath for the operating LPCI pump is from the suppression pool, through the RHR heat exchanger, and injecting into the vessel for the remainder of the event. The injected LPCI flow passes through the vessel, picking up the decay heat, then flows out of the pipe break back to the suppression pool via the downcomers, completing the flow loop. Thus, direct LPCI flow to the suppression pool is zero after 600 seconds. The CS pump remains in the pool return mode because the vessel injection mode was shut off upon the water level reaching Level 8 prior to 600 seconds and the water level does not drop to Level 1 again to re-actuate the vessel injection mode. This is conservatively done to continue adding the CS pump heat to the suppression pool. In addition, by assuming LPCI injection into the vessel, versus CS, more sensible energy from the vessel walls/internals is transferred to the suppression pool, as the LPCI pump has a higher flow rate than the CS pump.

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate	CS Enthalpy	CS Flowrate	CS Enthalpy	LPCI Flowrate	LPCI Enthalpy	LPCI Flowrate	LPCI Enthalpy
Seconds	(from SP)	(from SP)	(to SP)	(to SP)	(from SP)	(from SP)	(to SP)	(to SP)
	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
0	0		0		0		0	
25.66	0		0		0		0	
42.09	430.9	102.2	0		0		0	
59.00	430.9	105.9	0		1334	105.9	0	
76.78	430.9	108.5	0		1334	108.5	0	
88.53	430.9	109.8	0		1334	109.8	0	
97.66	430.9	110.6	0		1334	110.6	0	
106.88	430.9	111.5	0		1334	111.5	0	
117.34	430.9	112.6	0		1334	112.6	0	
129.23	430.9	113.6	0		1334	113.6	0	
144.61	430.9	114.2	0		1334	114.2	0	
158.95	430.9	114.6	0		1334	114.6	0	
174.33	430.9	115.1	0		1334	115.1	0	
189.95	430.9	115.3	0		1334	115.3	0	
205.42	430.9	115.5	0		1334	115.5	0	
221.05	430.9	115.6	0		1334	115.6	0	
236.67	430.9	115.7	0		1334	115.7	0	
252.36	430.9	115.7	0		1334	115.7	0	
268.11	430.9	115.8	0		1334	115.8	0	
283.80	430.9	115.8	0		1334	115.8	0	
299.16	430.9	115.8	430.9	117	1334	115.8	1334	116.5
314.78	430.9	115.8	430.9	117.1	1334	115.8	1334	116.5
330.41	430.9	115.9	430.9	117.1	1334	115.9	1334	116.5
345.25	430.9	115.9	430.9	117.1	1334	115.9	1334	116.6
353.59	430.9	115.9	430.9	117.1	1334	115.9	1334	116.6
361.41	430.9	115.9	430.9	117.1	1334	115.9	1334	116.6
373.63	430.9	116.4	430.9	117.6	1334	116.4	1334	117.1
389.25	430.9	117.6	430.9	118.8	1334	117.6	1334	118.3
404.88	430.9	119.0	430.9	120.2	1334	119.0	1334	119.7
420.13	430.9	120.4	0		1334	120.4	0	
435.59	430.9	121.2	0		1334	121.2	0	
451.13	430.9	121.8	0		1334	121.8	0	
466.75	430.9	122.2	0		1334	122.2	0	
482.31	430.9	122.5	0		1334	122.5	0	
497.94	430.9	122.7	0		1334	122.7	0	
513.56	430.9	122.8	0		1334	122.8	0	
529.19	430.9	122.9	0		1334	122.9	0	
544.81	430.9	122.9	430.9	124.1	1334	122.9	1334	123.6
560.44	430.9	122.9	430.9	124.1	1334	122.9	1334	123.6
576.06	430.9	123.0	430.9	124.2	1334	123.0	1334	123.6
591.69	430.9	123.0	430.9	124.2	1334	123.0	1334	123.7
644.67	430.9	123.0	430.9	124.2	667.2	123.0	0	
662.08	430.9	123.6	430.9	124.8	667.2	123.6	0	
679.14	430.9	124.2	430.9	125.4	667.2	124.2	0	
698.98	430.9	124.9	430.9	126.1	667.2	124.9	0	
727.77	430.9	125.6	430.9	126.8	667.2	125.6	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
757.45	430.9	126.2	430.9	127.4	667.2	126.2	0	
781.67	430.9	126.6	430.9	127.8	667.2	126.6	0	
811.14	430.9	127.1	430.9	128.3	667.2	127.1	0	
837.27	430.9	127.5	430.9	128.7	667.2	127.5	0	
864.64	430.9	128.0	430.9	129.2	667.2	128.0	0	
891.64	430.9	128.4	430.9	129.6	667.2	128.4	0	
927.14	430.9	129.0	430.9	130.2	667.2	129.0	0	
953.55	430.9	129.4	430.9	130.6	667.2	129.4	0	
980.73	430.9	129.9	430.9	131	667.2	129.9	0	
1093.14	430.9	131.7	430.9	132.9	667.2	131.7	0	
1301.17	430.9	135.0	430.9	136.2	667.2	135.0	0	
1498.80	430.9	137.9	430.9	139.1	667.2	137.9	0	
1679.45	430.9	140.3	430.9	141.5	667.2	140.3	0	
1850.73	430.9	142.3	430.9	143.5	667.2	142.3	0	
2038.80	430.9	144.3	430.9	145.5	667.2	144.3	0	
2242.36	430.9	146.2	430.9	147.4	667.2	146.2	0	
2447.36	430.9	147.9	430.9	149.1	667.2	147.9	0	
2655.23	430.9	149.5	430.9	150.7	667.2	149.5	0	
2844.61	430.9	150.9	430.9	152.1	667.2	150.9	0	
3029.36	430.9	152.2	430.9	153.4	667.2	152.2	0	
3219.86	430.9	153.4	430.9	154.6	667.2	153.4	0	
3411.27	430.9	154.5	430.9	155.7	667.2	154.5	0	
3608.45	430.9	155.6	430.9	156.8	667.2	155.6	0	
3802.27	430.9	156.6	430.9	157.9	667.2	156.6	0	
3997.27	430.9	157.6	430.9	158.9	667.2	157.6	0	
4194.14	430.9	158.6	430.9	159.8	667.2	158.6	0	
4391.02	430.9	159.5	430.9	160.7	667.2	159.5	0	
4586.83	430.9	160.3	430.9	161.6	667.2	160.3	0	
4776.70	430.9	161.1	430.9	162.3	667.2	161.1	0	
4965.83	430.9	161.8	430.9	163.1	667.2	161.8	0	
5163.64	430.9	162.5	430.9	163.8	667.2	162.5	0	
5354.45	430.9	163.2	430.9	164.5	667.2	163.2	0	
5549.02	430.9	163.9	430.9	165.1	667.2	163.9	0	
5744.27	430.9	164.5	430.9	165.8	667.2	164.5	0	
5934.64	430.9	165.1	430.9	166.4	667.2	165.1	0	
6108.39	430.9	165.7	430.9	166.9	667.2	165.7	0	
6291.52	430.9	166.2	430.9	167.5	667.2	166.2	0	
6467.30	430.9	166.8	430.9	168	667.2	166.8	0	
6659.55	430.9	167.3	430.9	168.6	667.2	167.3	0	
6859.67	430.9	167.9	430.9	169.1	667.2	167.9	0	
7044.48	430.9	168.4	430.9	169.7	667.2	168.4	0	
7223.67	430.9	168.8	430.9	170.1	667.2	168.8	0	
7419.61	430.9	169.3	430.9	170.6	667.2	169.3	0	
7617.92	430.9	169.8	430.9	171.1	667.2	169.8	0	
7815.30	430.9	170.3	430.9	171.6	667.2	170.3	0	
8017.86	430.9	170.7	430.9	172	667.2	170.7	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
8213.67	430.9	171.1	430.9	172.4	667.2	171.1	0	
8412.17	430.9	171.6	430.9	172.9	667.2	171.6	0	
8610.17	430.9	171.9	430.9	173.2	667.2	171.9	0	
8812.67	430.9	172.3	430.9	173.6	667.2	172.3	0	
9009.61	430.9	172.7	430.9	174	667.2	172.7	0	
9207.17	430.9	173.0	430.9	174.3	667.2	173.0	0	
9406.92	430.9	173.4	430.9	174.7	667.2	173.4	0	
9603.80	430.9	173.7	430.9	175	667.2	173.7	0	
9804.61	430.9	174.0	430.9	175.3	667.2	174.0	0	
10005.05	430.9	174.3	430.9	175.6	667.2	174.3	0	
10200.67	430.9	174.6	430.9	175.9	667.2	174.6	0	
10399.80	430.9	174.8	430.9	176.2	667.2	174.8	0	
10600.23	430.9	175.1	430.9	176.4	667.2	175.1	0	
10793.30	430.9	175.4	430.9	176.7	667.2	175.4	0	
10992.05	430.9	175.6	430.9	176.9	667.2	175.6	0	
11190.42	430.9	175.8	430.9	177.2	667.2	175.8	0	
11391.17	430.9	176.1	430.9	177.4	667.2	176.1	0	
11588.36	430.9	176.3	430.9	177.6	667.2	176.3	0	
11788.30	430.9	176.5	430.9	177.8	667.2	176.5	0	
11986.67	430.9	176.7	430.9	178.1	667.2	176.7	0	
12184.61	430.9	176.9	430.9	178.3	667.2	176.9	0	
12380.80	430.9	177.1	430.9	178.5	667.2	177.1	0	
12577.92	430.9	177.3	430.9	178.7	667.2	177.3	0	
12780.98	430.9	177.5	430.9	178.9	667.2	177.5	0	
12975.86	430.9	177.7	430.9	179	667.2	177.7	0	
13179.36	430.9	177.9	430.9	179.2	667.2	177.9	0	
13379.61	430.9	178.1	430.9	179.4	667.2	178.1	0	
13586.30	430.9	178.3	430.9	179.6	667.2	178.3	0	
13788.05	430.9	178.4	430.9	179.8	667.2	178.4	0	
13989.80	430.9	178.6	430.9	179.9	667.2	178.6	0	
14190.23	430.9	178.8	430.9	180.1	667.2	178.8	0	
14392.42	430.9	178.9	430.9	180.3	667.2	178.9	0	
14599.55	430.9	179.1	430.9	180.4	667.2	179.1	0	
14805.42	430.9	179.2	430.9	180.6	667.2	179.2	0	
15011.42	430.9	179.4	430.9	180.7	667.2	179.4	0	
15215.98	430.9	179.5	430.9	180.9	667.2	179.5	0	
15419.86	430.9	179.7	430.9	181	667.2	179.7	0	
15622.05	430.9	179.8	430.9	181.1	667.2	179.8	0	
15825.23	430.9	179.9	430.9	181.3	667.2	179.9	0	
16026.73	430.9	180.1	430.9	181.4	667.2	180.1	0	
16233.86	430.9	180.2	430.9	181.5	667.2	180.2	0	
16438.55	430.9	180.3	430.9	181.7	667.2	180.3	0	
16640.80	430.9	180.4	430.9	181.8	667.2	180.4	0	
16840.67	430.9	180.5	430.9	181.9	667.2	180.5	0	
17046.30	430.9	180.6	430.9	182	667.2	180.6	0	
17246.67	430.9	180.8	430.9	182.1	667.2	180.8	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
17449.80	430.9	180.9	430.9	182.2	667.2	180.9	0	
17652.80	430.9	181.0	430.9	182.3	667.2	181.0	0	
17853.61	430.9	181.1	430.9	182.4	667.2	181.1	0	
18056.98	430.9	181.2	430.9	182.5	667.2	181.2	0	
18261.11	430.9	181.3	430.9	182.6	667.2	181.3	0	
18460.61	430.9	181.3	430.9	182.7	667.2	181.3	0	
18662.17	430.9	181.4	430.9	182.8	667.2	181.4	0	
18863.05	430.9	181.5	430.9	182.9	667.2	181.5	0	
19068.48	430.9	181.6	430.9	183	667.2	181.6	0	
19266.23	430.9	181.7	430.9	183	667.2	181.7	0	
19467.61	430.9	181.7	430.9	183.1	667.2	181.7	0	
19672.30	430.9	181.8	430.9	183.2	667.2	181.8	0	
19874.42	430.9	181.9	430.9	183.3	667.2	181.9	0	
20073.30	430.9	182.0	430.9	183.3	667.2	182.0	0	
20276.23	430.9	182.0	430.9	183.4	667.2	182.0	0	
20480.11	430.9	182.1	430.9	183.5	667.2	182.1	0	
20682.98	430.9	182.1	430.9	183.5	667.2	182.1	0	
20888.55	430.9	182.2	430.9	183.6	667.2	182.2	0	
21089.11	430.9	182.3	430.9	183.6	667.2	182.3	0	
21290.92	430.9	182.3	430.9	183.7	667.2	182.3	0	
21495.61	430.9	182.4	430.9	183.7	667.2	182.4	0	
21698.67	430.9	182.4	430.9	183.8	667.2	182.4	0	
21901.48	430.9	182.5	430.9	183.8	667.2	182.5	0	
22106.80	430.9	182.5	430.9	183.9	667.2	182.5	0	
22306.55	430.9	182.6	430.9	183.9	667.2	182.6	0	
22508.98	430.9	182.6	430.9	184	667.2	182.6	0	
22707.05	430.9	182.6	430.9	184	667.2	182.6	0	
22909.30	430.9	182.7	430.9	184.1	667.2	182.7	0	
23111.36	430.9	182.7	430.9	184.1	667.2	182.7	0	
23307.48	430.9	182.8	430.9	184.1	667.2	182.8	0	
23509.92	430.9	182.8	430.9	184.2	667.2	182.8	0	
23717.55	430.9	182.8	430.9	184.2	667.2	182.8	0	
23918.48	430.9	182.9	430.9	184.2	667.2	182.9	0	
24120.05	430.9	182.9	430.9	184.3	667.2	182.9	0	
24320.42	430.9	182.9	430.9	184.3	667.2	182.9	0	
24523.92	430.9	182.9	430.9	184.3	667.2	182.9	0	
24727.98	430.9	183.0	430.9	184.4	667.2	183.0	0	
24929.55	430.9	183.0	430.9	184.4	667.2	183.0	0	
25134.11	430.9	183.0	430.9	184.4	667.2	183.0	0	
25336.05	430.9	183.1	430.9	184.4	667.2	183.1	0	
25537.30	430.9	183.1	430.9	184.5	667.2	183.1	0	
25741.23	430.9	183.1	430.9	184.5	667.2	183.1	0	
25944.05	430.9	183.1	430.9	184.5	667.2	183.1	0	
26148.23	430.9	183.1	430.9	184.5	667.2	183.1	0	
26349.55	430.9	183.2	430.9	184.5	667.2	183.2	0	
26552.73	430.9	183.2	430.9	184.6	667.2	183.2	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
26754.11	430.9	183.2	430.9	184.6	667.2	183.2	0	
26955.36	430.9	183.2	430.9	184.6	667.2	183.2	0	
27158.30	430.9	183.2	430.9	184.6	667.2	183.2	0	
27358.36	430.9	183.2	430.9	184.6	667.2	183.2	0	
27554.73	430.9	183.3	430.9	184.6	667.2	183.3	0	
27754.67	430.9	183.3	430.9	184.6	667.2	183.3	0	
27953.05	430.9	183.3	430.9	184.7	667.2	183.3	0	
28151.17	430.9	183.3	430.9	184.7	667.2	183.3	0	
28353.48	430.9	183.3	430.9	184.7	667.2	183.3	0	
28557.42	430.9	183.3	430.9	184.7	667.2	183.3	0	
28752.11	430.9	183.3	430.9	184.7	667.2	183.3	0	
28949.98	430.9	183.3	430.9	184.7	667.2	183.3	0	
29154.98	430.9	183.3	430.9	184.7	667.2	183.3	0	
29355.58	430.9	183.3	430.9	184.7	667.2	183.3	0	
29554.95	430.9	183.3	430.9	184.7	667.2	183.3	0	
29755.27	430.9	183.3	430.9	184.7	667.2	183.3	0	
29959.70	430.9	183.3	430.9	184.7	667.2	183.3	0	
30326.42	430.9	183.3	430.9	184.7	667.2	183.3	0	
30728.36	430.9	183.3	430.9	184.7	667.2	183.3	0	
31128.42	430.9	183.3	430.9	184.7	667.2	183.3	0	
31529.11	430.9	183.3	430.9	184.7	667.2	183.3	0	
31927.70	430.9	183.3	430.9	184.7	667.2	183.3	0	
32327.67	430.9	183.3	430.9	184.7	667.2	183.3	0	
32733.98	430.9	183.3	430.9	184.6	667.2	183.3	0	
33134.55	430.9	183.2	430.9	184.6	667.2	183.2	0	
33540.36	430.9	183.2	430.9	184.6	667.2	183.2	0	
33942.36	430.9	183.2	430.9	184.6	667.2	183.2	0	
34349.45	430.9	183.1	430.9	184.5	667.2	183.1	0	
34753.30	430.9	183.1	430.9	184.5	667.2	183.1	0	
35153.42	430.9	183.1	430.9	184.5	667.2	183.1	0	
35549.98	430.9	183.0	430.9	184.4	667.2	183.0	0	
35947.48	430.9	183.0	430.9	184.4	667.2	183.0	0	
36347.36	430.9	182.9	430.9	184.3	667.2	182.9	0	
36753.23	430.9	182.9	430.9	184.3	667.2	182.9	0	
37157.92	430.9	182.8	430.9	184.2	667.2	182.8	0	
37553.55	430.9	182.8	430.9	184.2	667.2	182.8	0	
37951.45	430.9	182.7	430.9	184.1	667.2	182.7	0	
38349.77	430.9	182.7	430.9	184	667.2	182.7	0	
38751.77	430.9	182.6	430.9	184	667.2	182.6	0	
39157.89	430.9	182.5	430.9	183.9	667.2	182.5	0	
39559.77	430.9	182.5	430.9	183.8	667.2	182.5	0	
39968.14	430.9	182.4	430.9	183.7	667.2	182.4	0	
40366.52	430.9	182.3	430.9	183.7	667.2	182.3	0	
40768.02	430.9	182.2	430.9	183.6	667.2	182.2	0	
41165.89	430.9	182.1	430.9	183.5	667.2	182.1	0	
41564.14	430.9	182.0	430.9	183.4	667.2	182.0	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
41963.92	430.9	181.9	430.9	183.3	667.2	181.9	0	
42367.55	430.9	181.8	430.9	183.2	667.2	181.8	0	
42769.42	430.9	181.7	430.9	183.1	667.2	181.7	0	
43171.55	430.9	181.6	430.9	183	667.2	181.6	0	
43580.80	430.9	181.5	430.9	182.9	667.2	181.5	0	
43984.42	430.9	181.4	430.9	182.8	667.2	181.4	0	
44392.67	430.9	181.3	430.9	182.7	667.2	181.3	0	
44798.30	430.9	181.2	430.9	182.6	667.2	181.2	0	
45204.05	430.9	181.1	430.9	182.5	667.2	181.1	0	
45603.80	430.9	181.0	430.9	182.4	667.2	181.0	0	
46005.80	430.9	180.9	430.9	182.3	667.2	180.9	0	
46405.36	430.9	180.8	430.9	182.1	667.2	180.8	0	
46804.98	430.9	180.7	430.9	182	667.2	180.7	0	
47204.36	430.9	180.6	430.9	181.9	667.2	180.6	0	
47604.23	430.9	180.4	430.9	181.8	667.2	180.4	0	
48007.17	430.9	180.3	430.9	181.7	667.2	180.3	0	
48408.80	430.9	180.2	430.9	181.6	667.2	180.2	0	
48821.67	430.9	180.1	430.9	181.5	667.2	180.1	0	
49227.55	430.9	180.0	430.9	181.3	667.2	180.0	0	
49630.36	430.9	179.9	430.9	181.2	667.2	179.9	0	
50033.36	430.9	179.7	430.9	181.1	667.2	179.7	0	
50435.36	430.9	179.6	430.9	181	667.2	179.6	0	
50840.17	430.9	179.5	430.9	180.8	667.2	179.5	0	
51244.80	430.9	179.4	430.9	180.7	667.2	179.4	0	
51654.30	430.9	179.2	430.9	180.6	667.2	179.2	0	
52059.67	430.9	179.1	430.9	180.5	667.2	179.1	0	
52470.11	430.9	179.0	430.9	180.3	667.2	179.0	0	
52870.73	430.9	178.9	430.9	180.2	667.2	178.9	0	
53274.48	430.9	178.7	430.9	180.1	667.2	178.7	0	
53674.86	430.9	178.6	430.9	180	667.2	178.6	0	
54079.98	430.9	178.5	430.9	179.8	667.2	178.5	0	
54476.92	430.9	178.4	430.9	179.7	667.2	178.4	0	
54888.17	430.9	178.2	430.9	179.6	667.2	178.2	0	
55301.30	430.9	178.1	430.9	179.4	667.2	178.1	0	
55710.30	430.9	177.9	430.9	179.3	667.2	177.9	0	
56114.17	430.9	177.8	430.9	179.1	667.2	177.8	0	
56518.42	430.9	177.7	430.9	179	667.2	177.7	0	
56925.98	430.9	177.5	430.9	178.9	667.2	177.5	0	
57334.11	430.9	177.4	430.9	178.7	667.2	177.4	0	
57743.11	430.9	177.3	430.9	178.6	667.2	177.3	0	
58150.98	430.9	177.1	430.9	178.4	667.2	177.1	0	
58558.61	430.9	177.0	430.9	178.3	667.2	177.0	0	
58971.23	430.9	176.8	430.9	178.2	667.2	176.8	0	
59378.11	430.9	176.7	430.9	178	667.2	176.7	0	
59774.98	430.9	176.5	430.9	177.9	667.2	176.5	0	
60184.23	430.9	176.4	430.9	177.7	667.2	176.4	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
60598.48	430.9	176.3	430.9	177.6	667.2	176.3	0	
61001.86	430.9	176.1	430.9	177.4	667.2	176.1	0	
61413.61	430.9	176.0	430.9	177.3	667.2	176.0	0	
61821.98	430.9	175.8	430.9	177.1	667.2	175.8	0	
62221.48	430.9	175.7	430.9	177	667.2	175.7	0	
62626.36	430.9	175.5	430.9	176.8	667.2	175.5	0	
63028.73	430.9	175.4	430.9	176.7	667.2	175.4	0	
63434.23	430.9	175.2	430.9	176.6	667.2	175.2	0	
63841.86	430.9	175.1	430.9	176.4	667.2	175.1	0	
64252.23	430.9	174.9	430.9	176.3	667.2	174.9	0	
64658.23	430.9	174.8	430.9	176.1	667.2	174.8	0	
65063.98	430.9	174.6	430.9	176	667.2	174.6	0	
65459.61	430.9	174.5	430.9	175.8	667.2	174.5	0	
65866.23	430.9	174.4	430.9	175.7	667.2	174.4	0	
66270.48	430.9	174.2	430.9	175.5	667.2	174.2	0	
66673.98	430.9	174.1	430.9	175.4	667.2	174.1	0	
67082.48	430.9	173.9	430.9	175.2	667.2	173.9	0	
67484.36	430.9	173.8	430.9	175.1	667.2	173.8	0	
67892.36	430.9	173.6	430.9	174.9	667.2	173.6	0	
68299.61	430.9	173.5	430.9	174.8	667.2	173.5	0	
68709.48	430.9	173.3	430.9	174.6	667.2	173.3	0	
69107.48	430.9	173.2	430.9	174.5	667.2	173.2	0	
69511.11	430.9	173.0	430.9	174.4	667.2	173.0	0	
69918.36	430.9	172.9	430.9	174.2	667.2	172.9	0	
70320.36	430.9	172.8	430.9	174.1	667.2	172.8	0	
70719.86	430.9	172.6	430.9	173.9	667.2	172.6	0	
71130.98	430.9	172.5	430.9	173.8	667.2	172.5	0	
71538.23	430.9	172.3	430.9	173.6	667.2	172.3	0	
71940.73	430.9	172.2	430.9	173.5	667.2	172.2	0	
72342.73	430.9	172.0	430.9	173.3	667.2	172.0	0	
72742.48	430.9	171.9	430.9	173.2	667.2	171.9	0	
73148.86	430.9	171.7	430.9	173	667.2	171.7	0	
73548.86	430.9	171.6	430.9	172.9	667.2	171.6	0	
73955.11	430.9	171.5	430.9	172.8	667.2	171.5	0	
74360.73	430.9	171.3	430.9	172.6	667.2	171.3	0	
74761.48	430.9	171.2	430.9	172.5	667.2	171.2	0	
75168.23	430.9	171.0	430.9	172.3	667.2	171.0	0	
75575.98	430.9	170.9	430.9	172.2	667.2	170.9	0	
75984.36	430.9	170.7	430.9	172	667.2	170.7	0	
76385.48	430.9	170.6	430.9	171.9	667.2	170.6	0	
76786.73	430.9	170.4	430.9	171.7	667.2	170.4	0	
77192.61	430.9	170.3	430.9	171.6	667.2	170.3	0	
77600.23	430.9	170.2	430.9	171.4	667.2	170.2	0	
78006.86	430.9	170.0	430.9	171.3	667.2	170.0	0	
78416.98	430.9	169.9	430.9	171.1	667.2	169.9	0	
78824.23	430.9	169.7	430.9	171	667.2	169.7	0	

Table 1
SHEX DBA-LOCA RESULTS

Time	CS Flowrate (from SP)	CS Enthalpy (from SP)	CS Flowrate (to SP)	CS Enthalpy (to SP)	LPCI Flowrate (from SP)	LPCI Enthalpy (from SP)	LPCI Flowrate (to SP)	LPCI Enthalpy (to SP)
Seconds	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm	lbm/sec	Btu/lbm
79226.61	430.9	169.6	430.9	170.9	667.2	169.6	0	
79634.86	430.9	169.4	430.9	170.7	667.2	169.4	0	
80037.23	430.9	169.3	430.9	170.6	667.2	169.3	0	
80443.61	430.9	169.1	430.9	170.4	667.2	169.1	0	
80854.61	430.9	169.0	430.9	170.3	667.2	169.0	0	
81262.23	430.9	168.9	430.9	170.1	667.2	168.9	0	
81668.86	430.9	168.7	430.9	170	667.2	168.7	0	
82075.61	430.9	168.6	430.9	169.8	667.2	168.6	0	
82486.86	430.9	168.4	430.9	169.7	667.2	168.4	0	
82895.36	430.9	168.3	430.9	169.6	667.2	168.3	0	
83302.23	430.9	168.1	430.9	169.4	667.2	168.1	0	
83712.61	430.9	168.0	430.9	169.3	667.2	168.0	0	
84124.61	430.9	167.8	430.9	169.1	667.2	167.8	0	
84530.11	430.9	167.7	430.9	169	667.2	167.7	0	
84940.73	430.9	167.6	430.9	168.8	667.2	167.6	0	
85349.48	430.9	167.4	430.9	168.7	667.2	167.4	0	
85753.48	430.9	167.3	430.9	168.6	667.2	167.3	0	
86161.98	430.9	167.1	430.9	168.4	667.2	167.1	0	
86400.11	430.9	167.1	430.9	168.3	667.2	167.1	0	