Appendix E - Test Results

Number of pages including this sheet = 204

OK ✓

altran Corporation

Appendix E

Calculation of column closure waterhammer pressure pulse:

$\Delta P(\rho, C, V) := \frac{1}{2} \cdot \rho \cdot C \cdot V \cdot \left(\frac{1}{g}\right)$ $\quad g := 32.2 \cdot \frac{ft}{sec^2}$ $\quad C := 2300 \cdot \frac{ft}{sec}$ $\quad \rho := 62.5 \cdot \frac{lb}{ft^3}$

conservatively high water density

For WCNOC the B train column closure waterhammer will occur in the 10" sch 40 discharge piping with an impact velocity equal to the summation of the forward and reverse velocities:

$V_{forward} := 10.32 \cdot \frac{ft}{sec}$ [reference 21]

$V_{reverse} := 2.1 \cdot \frac{ft}{sec}$ [reference 21]

Altran Report 916229-R-01 Rev. 3 Att./Appx. E Sh E2

$V_{Bimpact} := V_{forward} + V_{reverse}$

$V_{Bimpact} = 12.42 \cdot \frac{ft}{sec}$

The B train column closure waterhammer is then calculated as:

$\Delta P_B := \Delta P(\rho, C, V_{Bimpact})$

$\Delta P_B = 192.678 \cdot \frac{lb}{in^2}$

The A train column closure waterhammer will occur in the 14" discharge piping which is common to both the A and C coolers. The volumetric flow rate is higher at closure than the B train but there is more flow area available than the B train. The impact velocity and resultant column closure waterhammer on the A train is then:

$A_{10} := 0.5475 \cdot ft^2$ $\quad A_{14} := 0.9394 \cdot ft^2$

$V_{Aimpact} := V_{Bimpact} \cdot 2 \cdot \left(\frac{A_{10}}{A_{14}}\right)$

$V_{Aimpact} = 14.477 \cdot \frac{ft}{sec}$

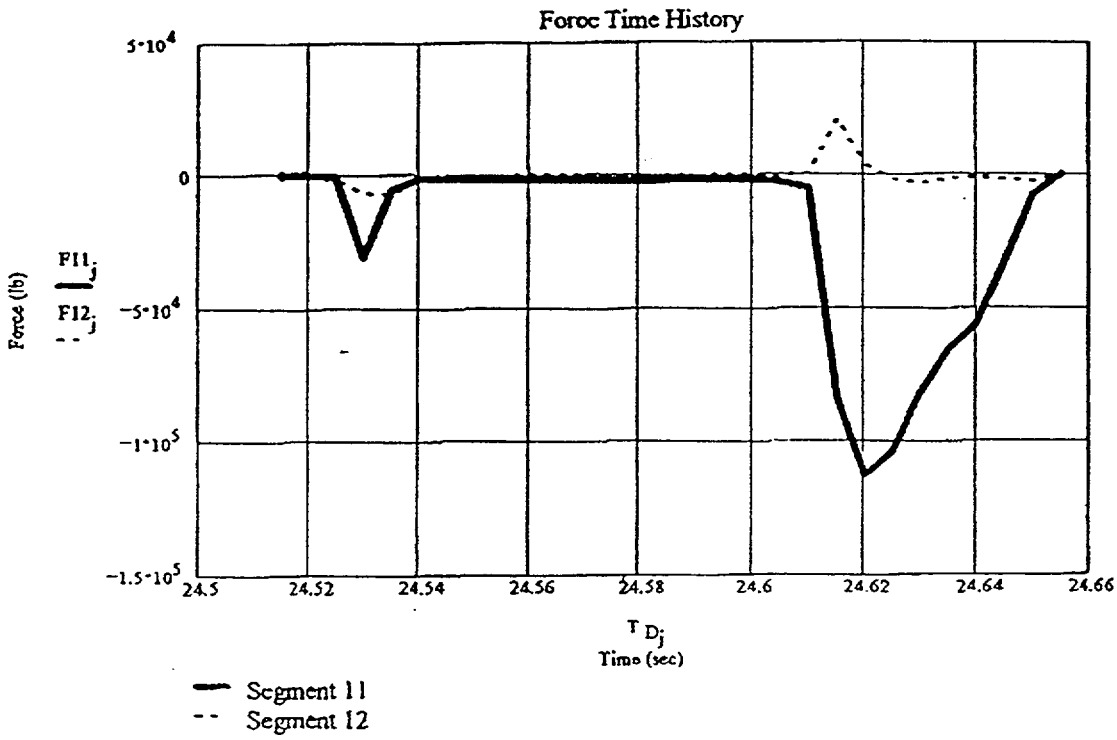
$\Delta P_A := \Delta P(\rho, C, V_{Aimpact})$

$\Delta P_A = 224.593 \cdot \frac{lb}{in^2}$

altran Corporation

Appendix E

Column closure on the return side of the B cooler occurs after column closure on the D cooler. The load increases to a larger magnitude and for longer period of time than the load on the B cooler piping since segment 11 is so long. The figure below shows the RELAP generated forcing functions on segment 11 and 12.



The pressure pulse magnitude is then at least as large as the maximum force divided by the flow area:

$$\Delta P(F,A) := \frac{F}{A}$$

$F_{max} := F11_{21} \cdot lb + 2000 \cdot lb$ $\quad F_{max} = -8.13 \cdot 10^4 \cdot lb$

2000lb added since the load on the pipe segment is approximately 2000 lb when pulse starts. The load at j=21 is used since there is a slope change in the load at the next time step which could have been caused by loads on an adjacent segment.

$A := 0.5475 \cdot ft^2$

$\Delta P_{min} := \left|\Delta P\left(F_{max}, A\right)\right|$

$\Delta P_{min} = 1.03 \cdot 10^3 \cdot \frac{lb}{in^2}$

The RELAP generated pressure pulse was at least this large.

altran Corporation

Appendix E

94100-C-01 described two reasons to reduce the pressure pulse (and subsequently the load). First, the RELAP model overpredicted the water velocity at closure. The final time history loads were recommended to be corrected by dividing by 1.4 (the loads are directly proportional to the pressure pulse). Second, the RELAP model could not accommodate the mitigating effects of air in water (sonic velocity reduction, density reduction, and cushioning effects). The final pulse was recommended to be corrected by multiplying by 50%. The recommended corrected pulse was then:

$$\text{Correction} := \frac{0.5}{1.4} \qquad \text{Correction} = 0.36$$

$$\Delta P_{seg11} := \text{Correction} \cdot \Delta P_{min} \qquad \Delta P_{seg11} = 368.39 \cdot \frac{lb}{in^2}$$

The Joukowski equation is used to calculate the magnitude of the column closure pulse:

$$\Delta P(\rho, V, C, g) := \frac{1}{2} \cdot \rho \cdot V \cdot C \cdot \left(\frac{1}{g}\right)$$

$$g := 32.2 \cdot \frac{ft}{sec^2}$$ constant gravitational acceleration

$$\rho := 60.1 \cdot \frac{lb}{ft^3}$$ approximate per page 18 of 94100-C-01

Page 19 of 94100-C-01 describes that the RELAP model predicts a closure velocity in the 10" return piping of 14.36 ft/sec. It is assumed that the velocity referred to here is the forward velocity only, not a relative velocity. RELAP probably calculated a reverse direction flow during closure since the CCW flow path was included in the model. The forward velocity used in development of the loads was then:

$$V_{forward} := \frac{14.36 \cdot \frac{ft}{sec}}{1.4} \qquad V_{forward} = 10.26 \cdot \frac{ft}{sec}$$

The forward flow velocity compares favorably with the forward velocity used from reference 21 (10.32 ft/sec). Since the reference 21 forward flow velocity matched the RELAP velocity, it is assumed that the reverse flow velocity from reference 21 is also applicable.

$$V_{reverse} := 2.1 \cdot \frac{ft}{sec} \qquad V_{total} := V_{reverse} + V_{forward} \qquad V_{total} = 12.36 \cdot \frac{ft}{sec}$$

The sonic velocity used to calculate the loads is then determined:

$$C := \frac{2 \cdot \Delta P_{seg11} \cdot g}{\rho \cdot V_{total}}$$

$$C = 4.6 \cdot 10^3 \cdot \frac{ft}{sec}$$

4600 ft/sec is the expected sonic velocity without correcting for non-condensibles and piping compliance. This provides a check of the recommended reductions in the RELAP model loads. It also demonstrates that even the corrected pulse was conservative by a factor of two since a sonic velocity of 2300 ft/sec is more appropriate.

altran Corporation

Appendix E

A sonic velocity of 2300 ft/sec is more appropriate. The loads and pressure pulses recommended by 94100-C-01 are conservative by a factor of:

$$\text{Conservatism} := \frac{C}{2300 \cdot \frac{ft}{sec}} \qquad \text{Conservatism} = 2$$

94100-C-02 describes on page 7 and in section 5.1.5 that a 50% reduction of the loads from 94100-C-01 was applied to account for the air issues described above. 94100-C-02 does not reduce the loads for the flow issue described above. As a result the 94100-C-02 analysis is even more conservative:

$$\text{Conservatism} := \text{Conservatism} \cdot 1.4$$

$$\text{Conservatism} = 2.8 \qquad \frac{1}{\text{Conservatism}} = 0.36$$

Loads of approximately 36% of those used in the 94100-C-02 analysis are more appropriate.

WOLF CREEK
NUCLEAR OPERATING CORPORATION

INTEROFFICE CORRESPONDENCE

TO: K. W. Montgomery (WC-RE) **TS 91-1044**

FROM: R. W. Wollum (WC-IC)

DATE: December 12, 1991

SUBJECT: CTMT Cooler Pressure Spike Data

Altran Port
96227-TR-01 Rev. 3
Att./Appx E Sh E6

On 11-12-91 and 11-14-91, data was collected to quantify the magnitude of pressure spikes reaching the containment coolers.

The data collection setup, based on your request, was as follows:

* pressure sensor connection at GNV071 (D CTMT Cooler)
* rosemount transmitter (Model 1151GP) scaled to 0-1000 PSIG/ 4 mA - 20 mA ± 0.5%
* data acquisition using Gould DASA and VIEW II software
* signal to A/D converter was 1-5 VDC developed across a 250 ohm, 1% resistor in a 4 - 20 mA current loop

Data was recorded during the actuation sections of STS KJ-001B. Each data run is numbered for the step of STS KJ-001B controlling pump actuations and trips. Each data run includes:

* a brief note describing the actuation or trip
* specifics of the data acquisition setup
* a small chart of the actuation or trip
* a full page chart of the actuation or trip
* actual data represented by the chart

For test sequences and specifics, please refer to STS KJ-001B.

If you have any questions, please call me at extension 4728.

RWW/tlm

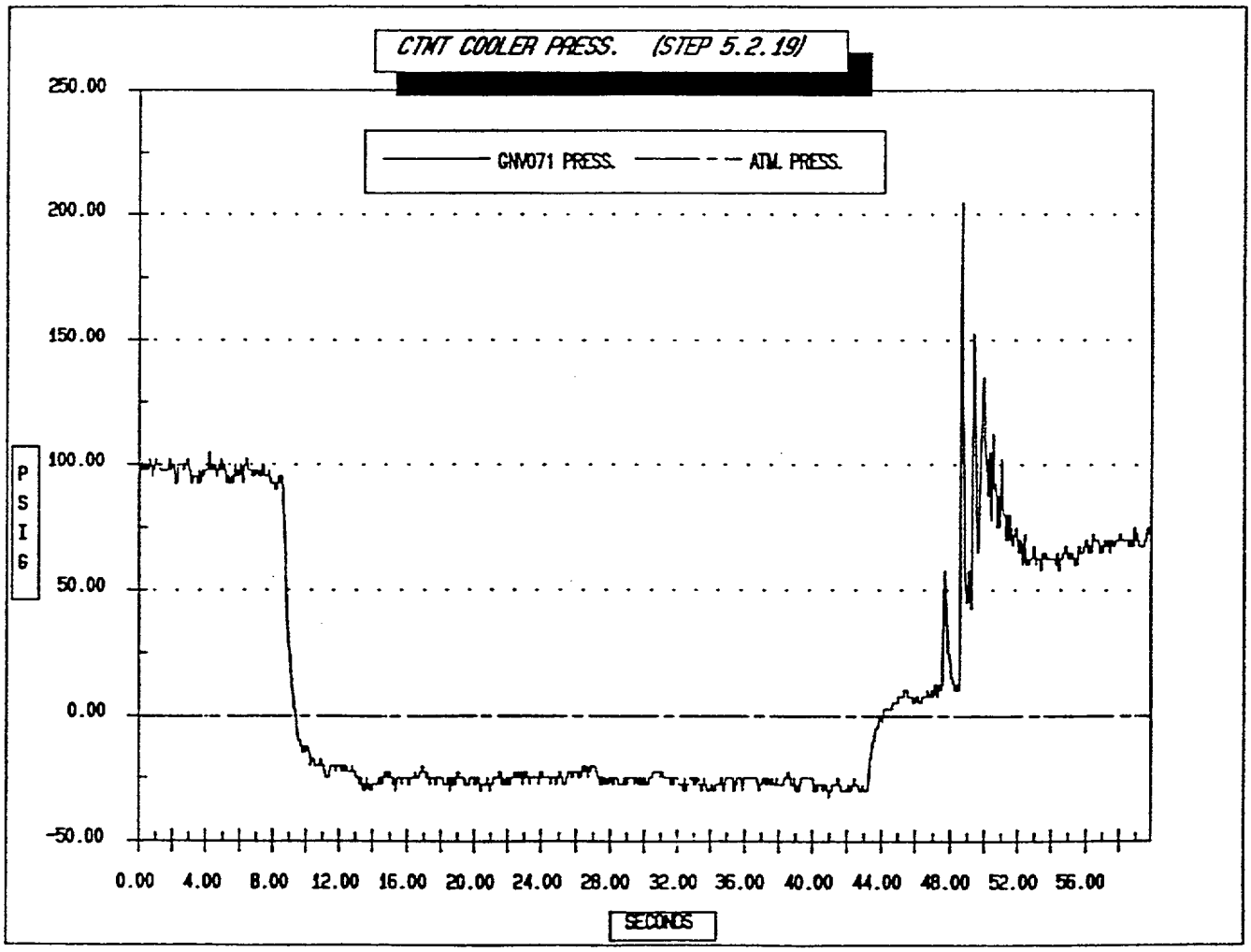
Attachment

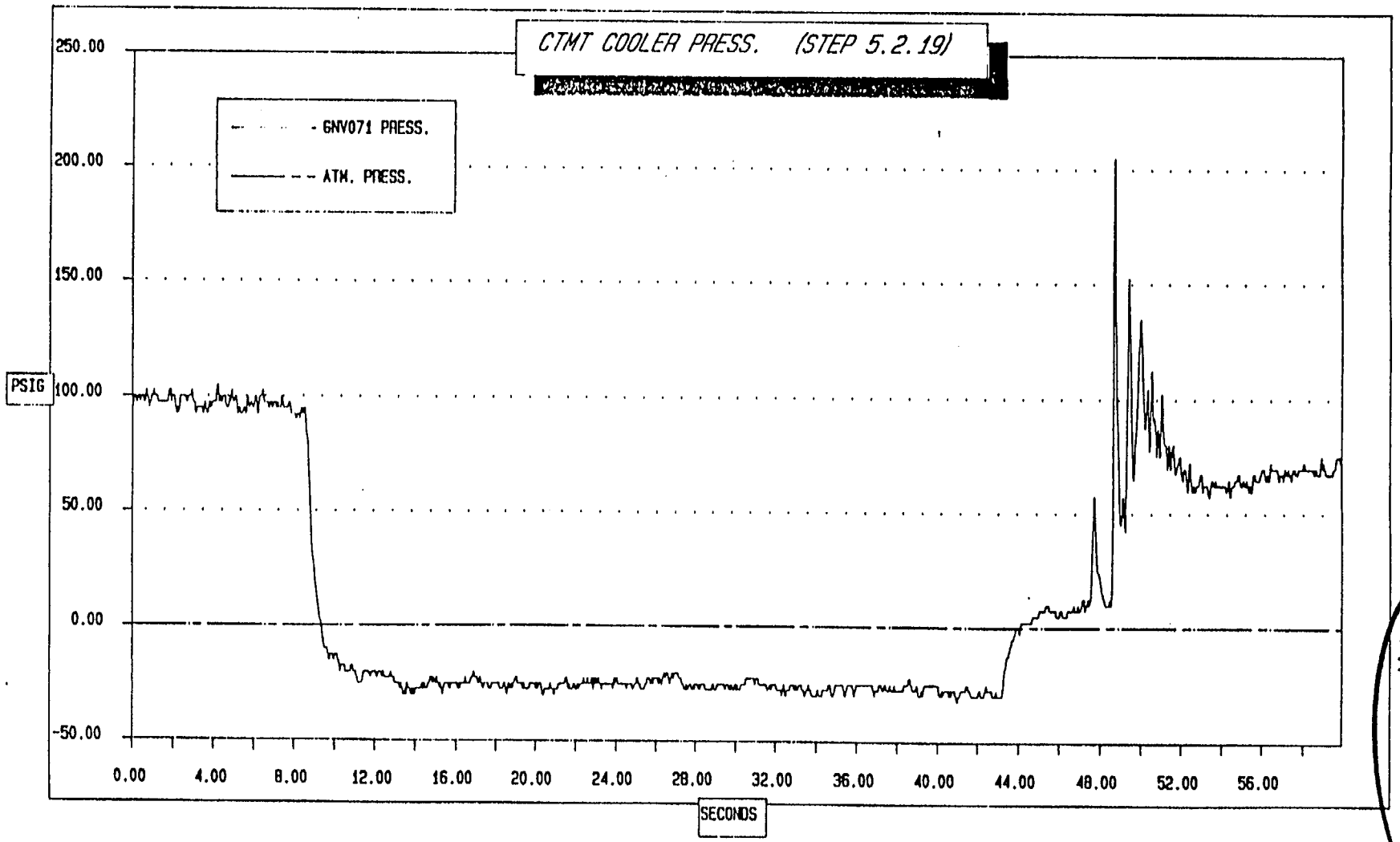
cc: C. W. Fowler (WC-IC) w/o
D. E. Gerrelts (WC-IC) w/o
W. B. Norton (WC-AD) w/o
Records Management (WC-DS) w/o

Data collected during step 5.2.19. SI with loss of offsite power. Data shows ESW pump shutdown during load shed and restarted by the LOCA Sequencer. Service water was NOT cross connected with ESW during this section of test.

Test: STS KJ-001R STEP 5.2.19	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	820.00
Last Sample:	2320.00
Trigger Date:	11-12-1991
Trigger Time:	04:34:56.70
X-Axis Units at First Sample:	32.76
Sample Separation:	0.04
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.82
Y-Axis Min Value:	0.87
Y-Axis Units:	VOLTS

Altra[illegible]rt
96227-TR-01 Rev. 3
Att./Appx. E Sh. E7





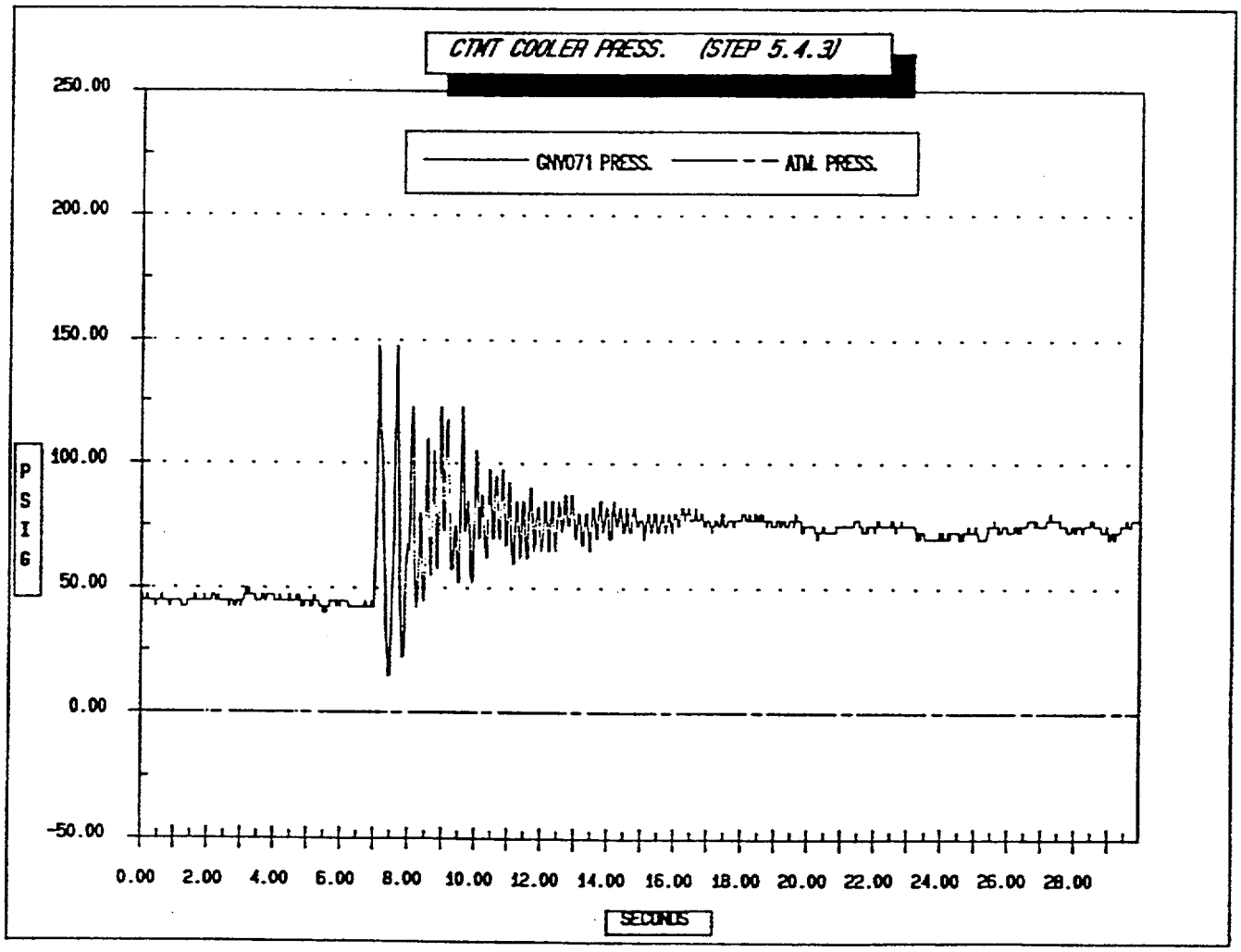
Altran Report
962270R-01 Rev. 3
Att/Appx. E Sh. E8

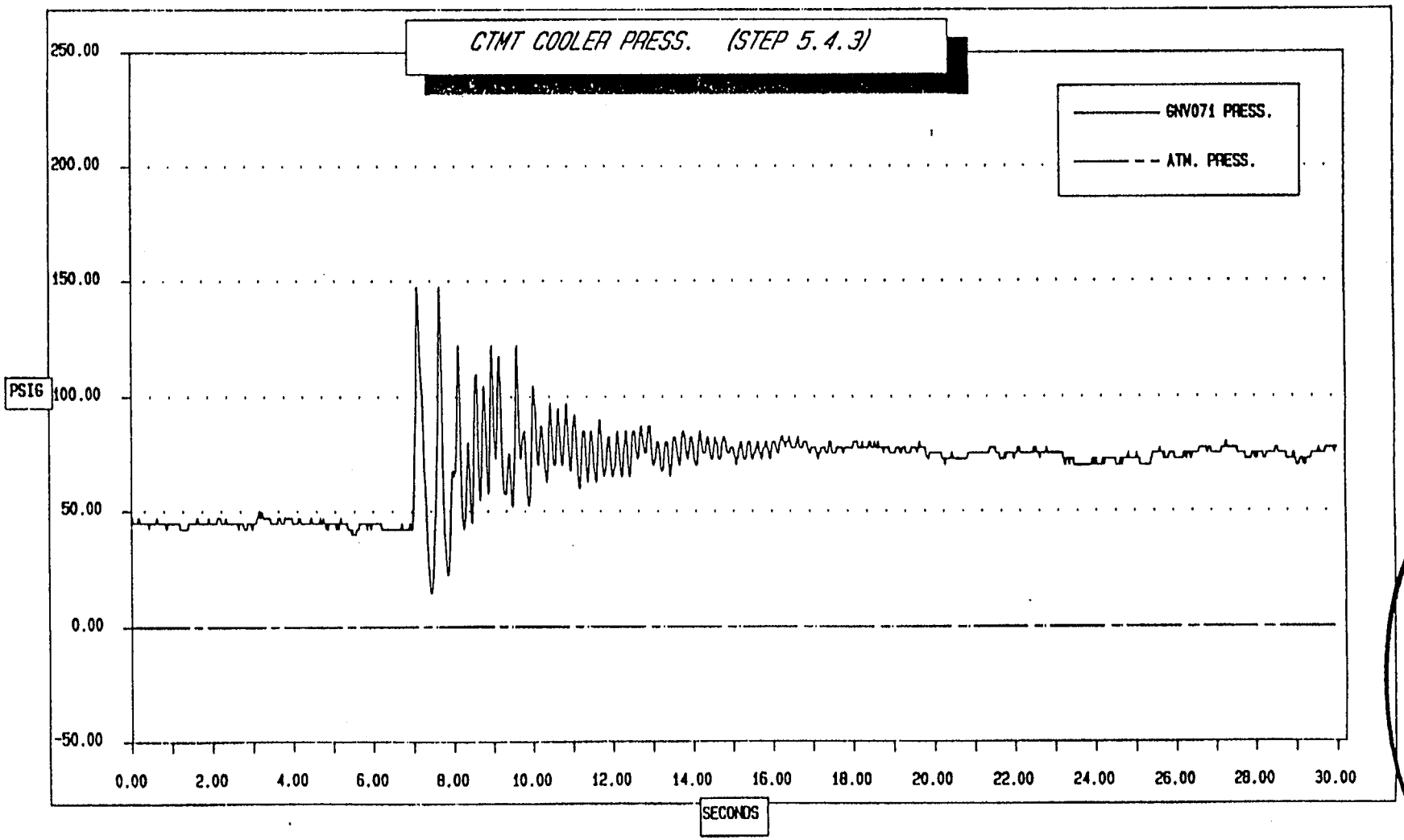
2

Data collected during ESW Pump start, step 5.4.3, system line-ups. Data shows initial pressure spikes during ESW pump start with service water cross connected to maintain system fill and pressure.

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E9

Test: STS KJ-001B, STEP 5.4.3	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	7372.00
Last Sample:	8872.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	147.40
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.59
Y-Axis Min Value:	1.06
Y-Axis Units:	VOLTS





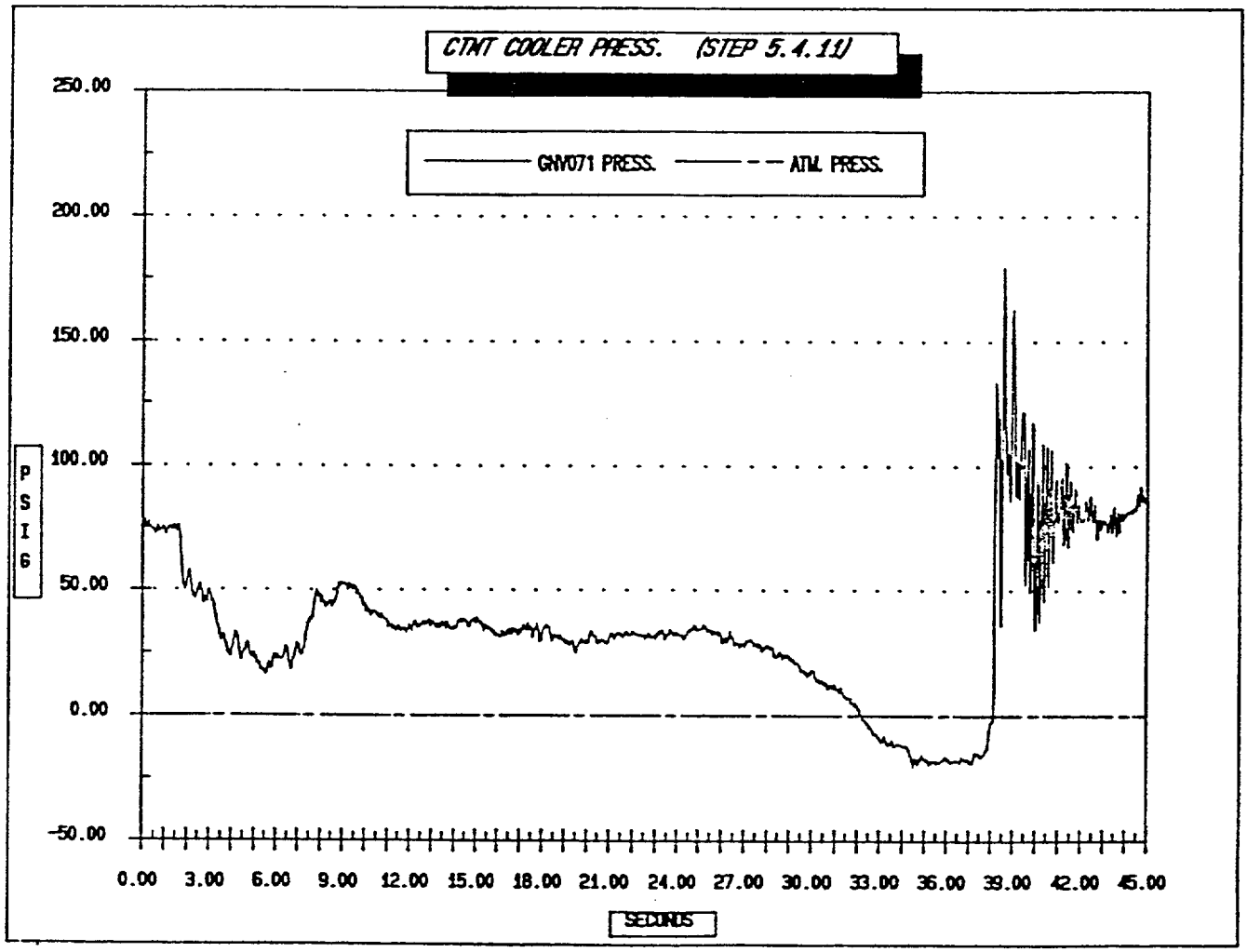
Altran Report
92227R-01 Rev. 3
Att/Appx. E Sh. E10

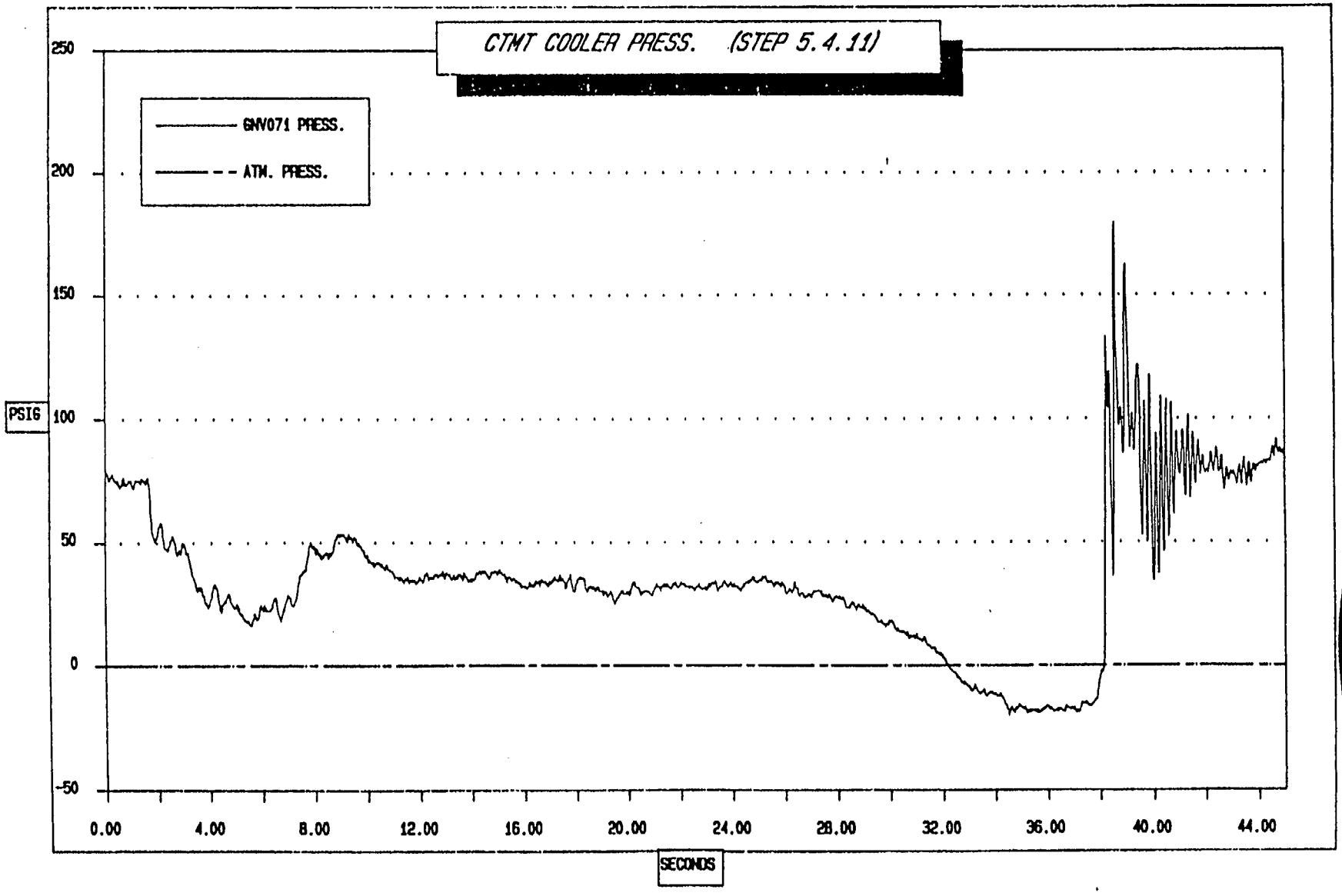
3

Data collected during step 5.4.11, loss of offsite power without SI. Data shows ESW pump shutdown during load shed and restarted by the Shutdown Sequencer. Service water is cross connected to maintain system fill and

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E11

Test: STS KJ-001B, STEP 5.4.11	
Run:	0
Device:	MB16
Channel:	1
Event:	1
First Sample:	10024
Last Sample:	12274
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	200.5
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5
Y-Axis Lower Limit:	-5
Y-Axis Max Value:	1.718
Y-Axis Min Value:	0.9194
Y-Axis Units:	VOLTS



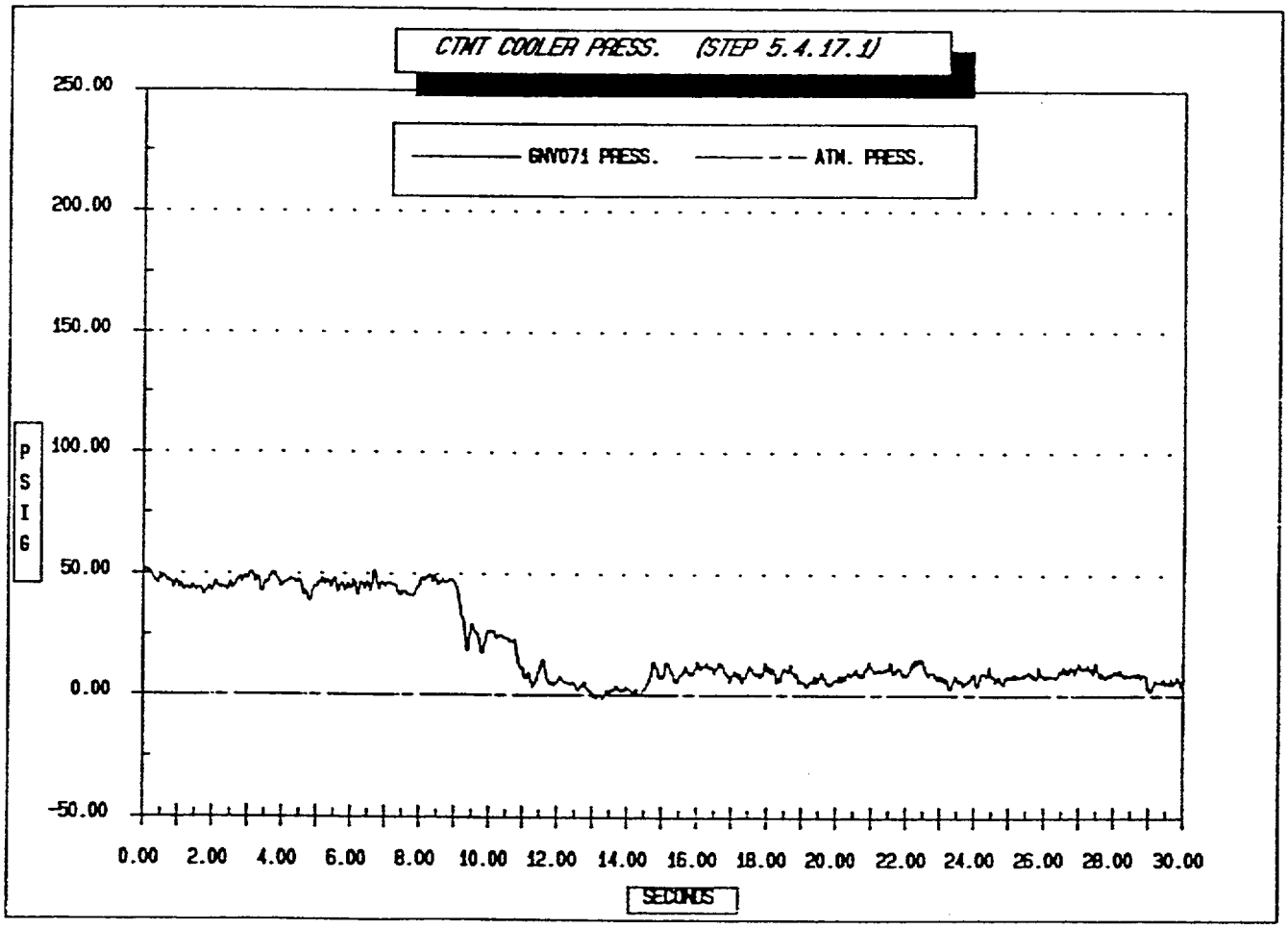


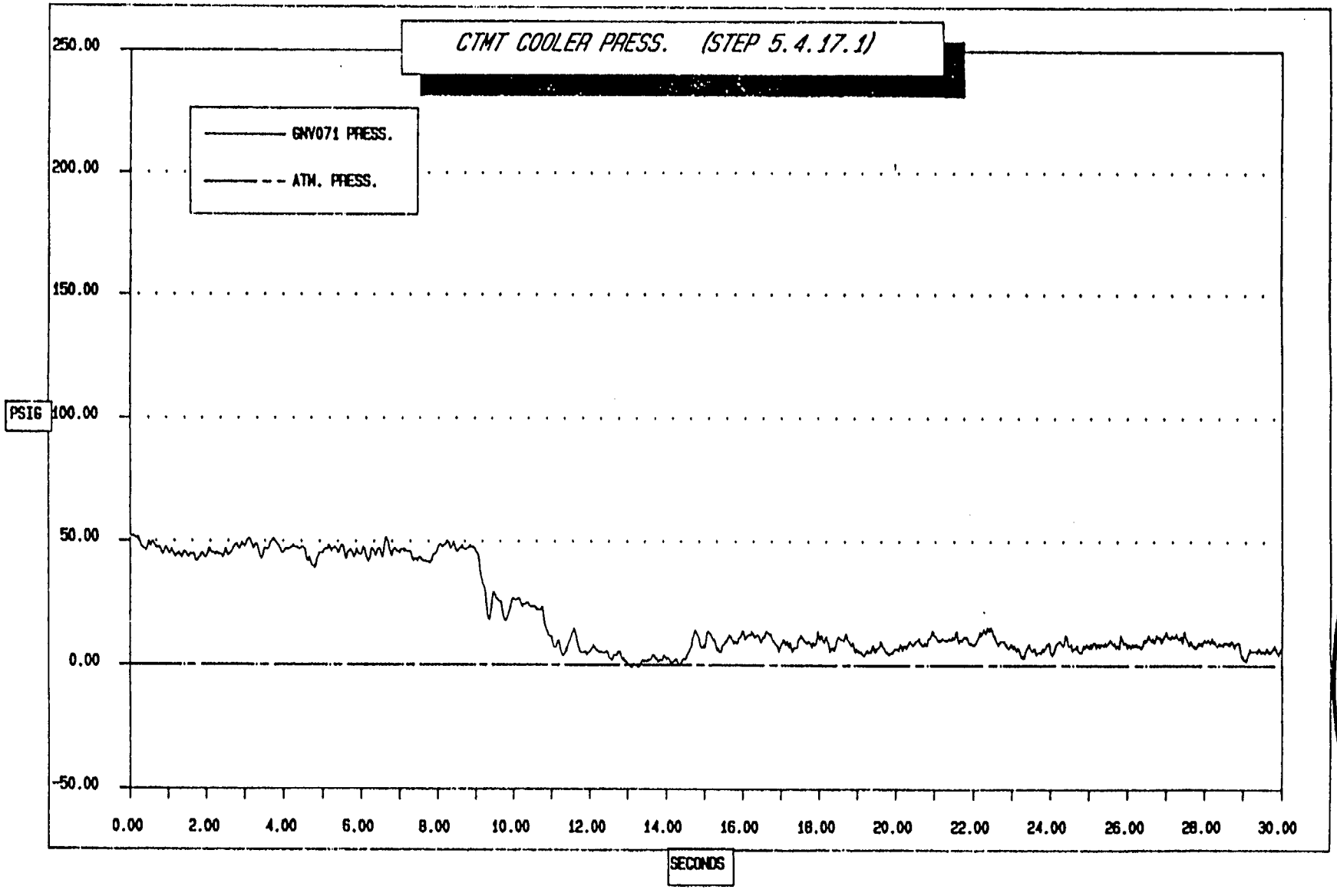
Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E12

Data collected during step 5.4.17.1, ESW pump load reject. Data shows ESW pump shutdown by placing the handswitch in PTL. Service water is cross connected to maintain system fill and pressure.

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E13

Test: STS KJ-001B, STEP 5.4.17.1	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	36301.00
Last Sample:	37801.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	726.00
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.21
Y-Axis Min Value:	1.00
Y-Axis Units:	VOLTS





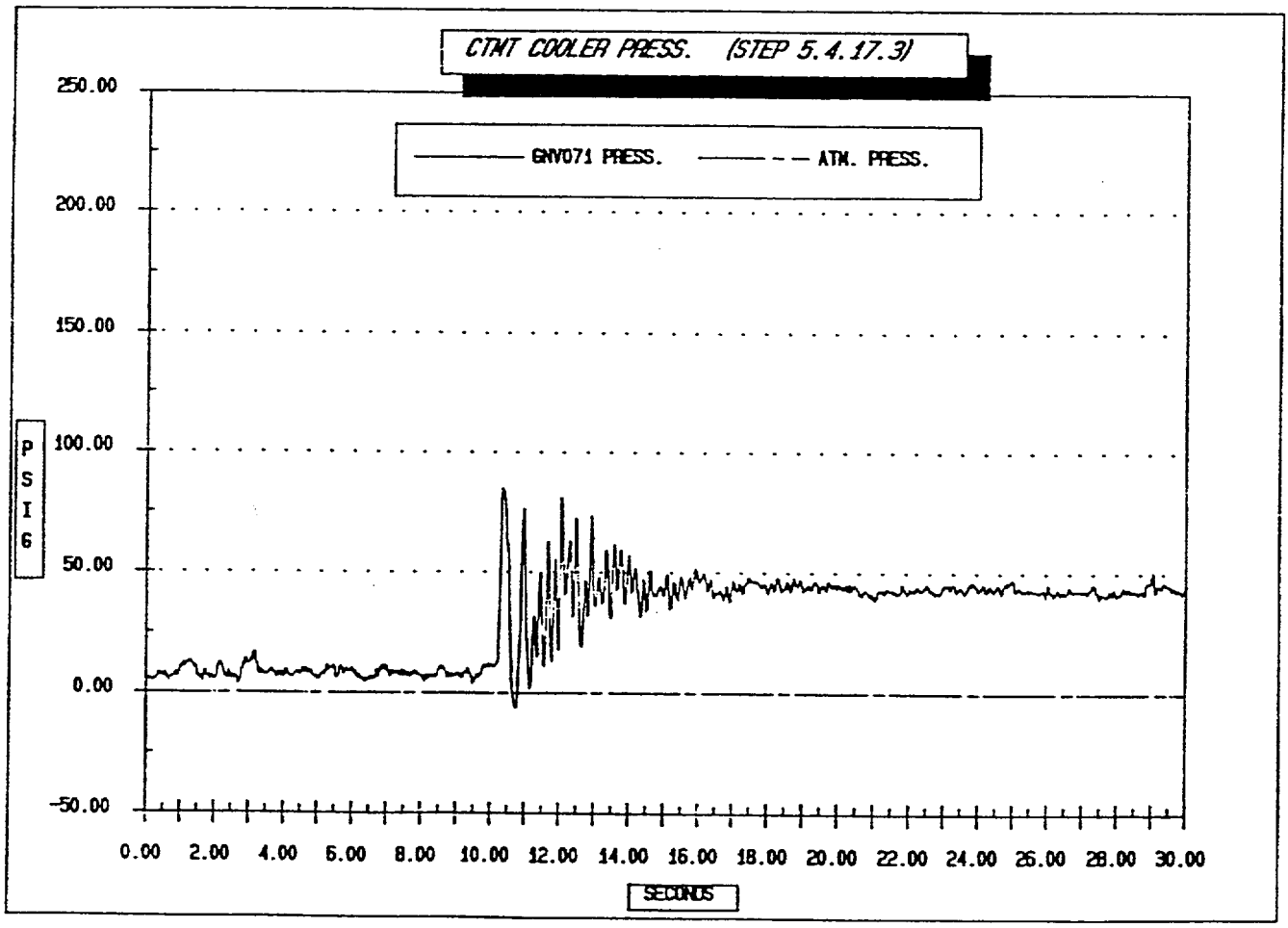
Altran Report 92227-TR-01 Rev. 3
Att/Appx. E Sh E14

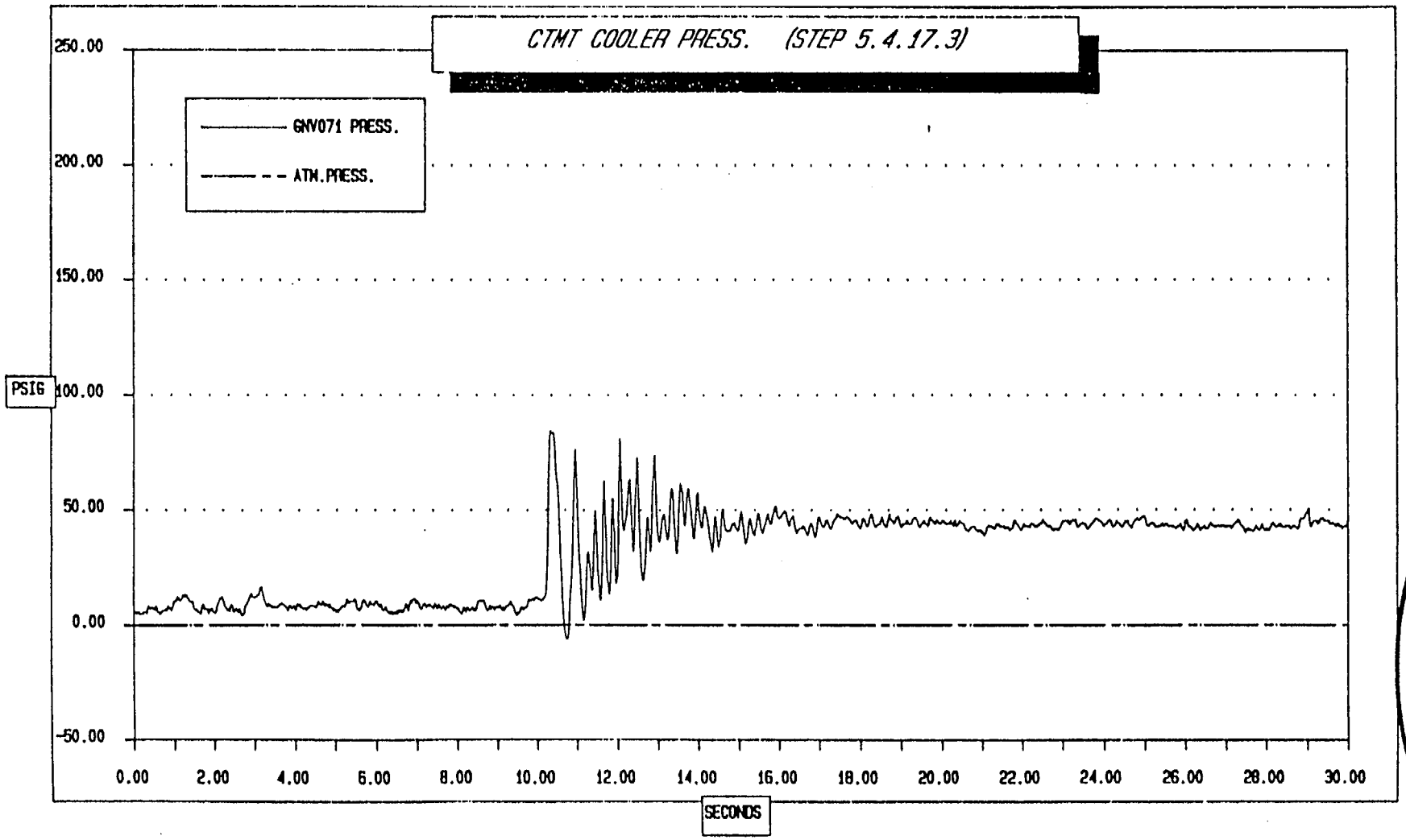
5

Data collected during step 5.4.17.3, ESW pump start following load reject test. Data shows ESW pump start after coastdown to zero shaft revolutions. Service water is cross connected to maintain system fill and pressure.

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E15

Test: STS KJ-001B STEP 5.4.17.3	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	40401.00
Last Sample:	41901.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	808.00
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.34
Y-Axis Min Value:	0.98
Y-Axis Units:	VOLTS



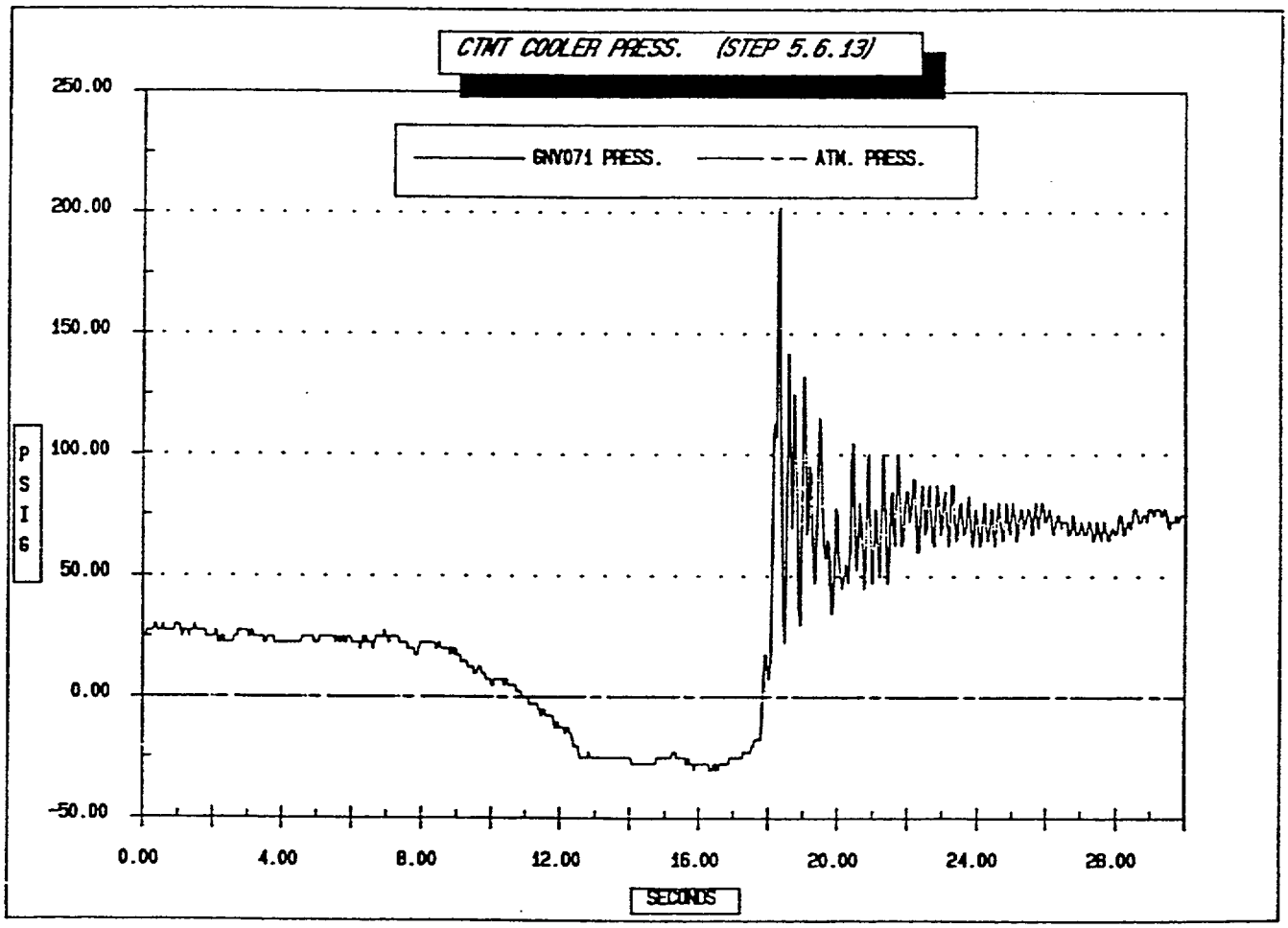


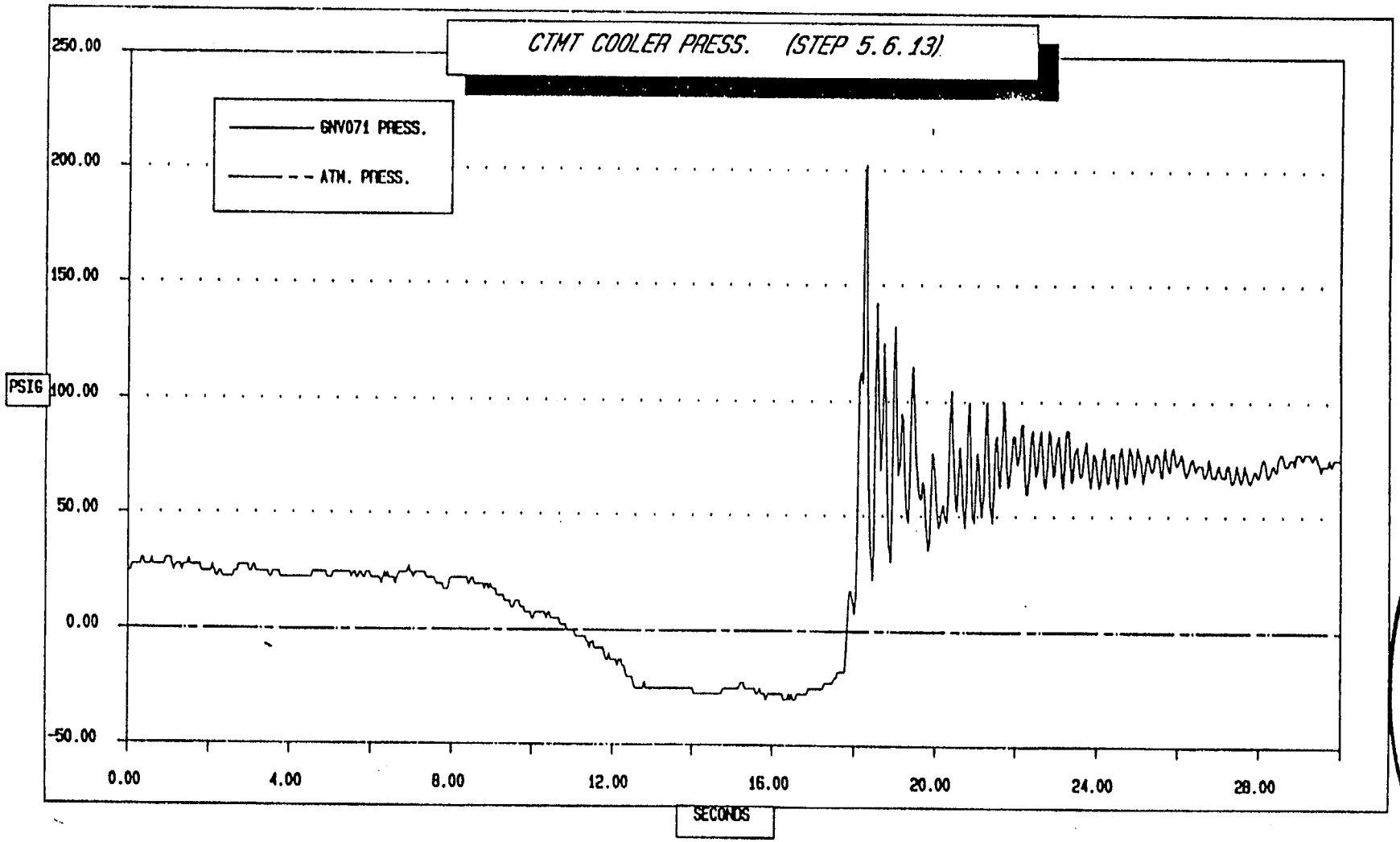
Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E16

6 Data collected during step 5.6.13, SI without loss of offsite power. Data shows service water shutdown during load shed and ESW pump started by the LOCA Sequencer. Service water was in service prior to SI signal.

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E17

Test: STS KJ-001B, STEP 5.6.13	
Run:	2.00
Device:	NB16
Channel:	1
Event:	1
First Sample:	980.00
Last Sample:	1730.00
Trigger Date:	11-12-1991
Trigger Time:	18:42:58.03
X-Axis Units at First Sample:	39.16
Sample Separation:	0.04
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.81
Y-Axis Min Value:	0.88
Y-Axis Units:	VOLTS





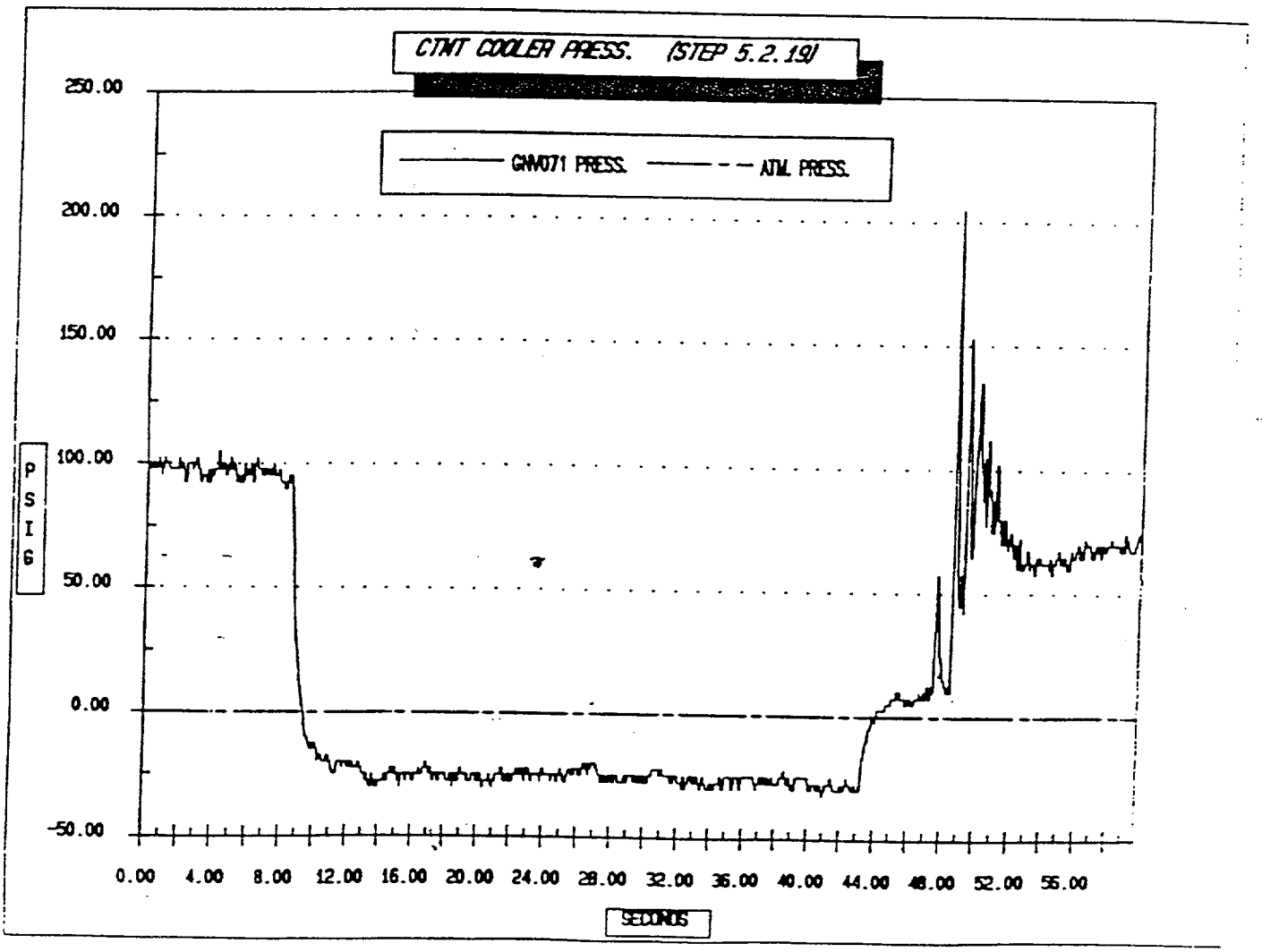
Altran Report
96227-NR-01 Rev. 3
Att/Appx. E Sh. E18

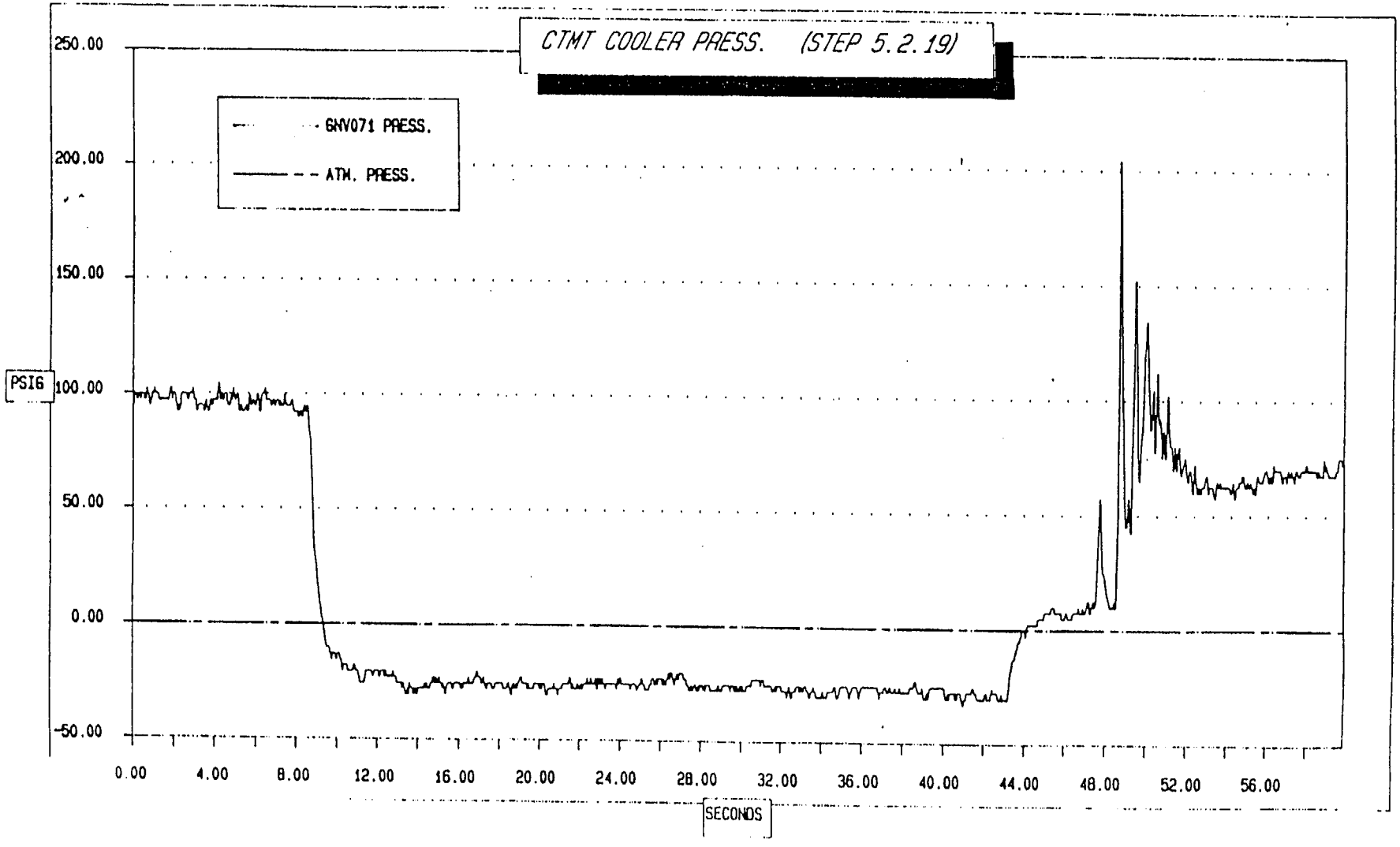
Data collected during step 5.2.19. SI with loss of offsite power. Data shows ESW pump shutdown during load shed and restarted by the LOCA Sequencer. Service water was NOT cross connected with ESW during this section of test.

Test: STS KJ-001B STEP 5.2.19	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	820.00
Last Sample:	2320.00
Trigger Date:	11-12-1991
Trigger Time:	04:34:56.70
X-Axis Units at First Sample:	32.76
Sample Separation:	0.04
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.82
Y-Axis Min Value:	0.87
Y-Axis Units:	VOLTS

Altran Report
96227-TR-01 Rev. 3
Att./Appx. F Sh E19

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: Date:
Verified By: TD Date: 5/7/92
Sheet 1 of 21





Altran Report 96227-02-01 Rev. 3
Att./Appx. E Sh. E20

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 31

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E21

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.38	0.00	95.00
0.04	1.40	0.00	100.00
0.08	1.40	0.00	100.00
0.12	1.40	0.00	100.00
0.16	1.39	0.00	97.50
0.20	1.39	0.00	97.50
0.24	1.40	0.00	100.00
0.28	1.40	0.00	100.00
0.32	1.40	0.00	100.00
0.36	1.39	0.00	97.50
0.40	1.40	0.00	100.00
0.44	1.40	0.00	100.00
0.48	1.40	0.00	100.00
0.52	1.39	0.00	97.50
0.56	1.39	0.00	97.50
0.60	1.40	0.00	100.00
0.64	1.41	0.00	102.50
0.68	1.40	0.00	100.00
0.72	1.40	0.00	100.00
0.76	1.39	0.00	97.50
0.80	1.38	0.00	95.00
0.84	1.39	0.00	97.50
0.88	1.39	0.00	97.50
0.92	1.40	0.00	100.00
0.96	1.40	0.00	100.00
1.00	1.41	0.00	102.50
1.04	1.40	0.00	100.00
1.08	1.40	0.00	100.00
1.12	1.40	0.00	100.00
1.16	1.40	0.00	100.00
1.20	1.40	0.00	100.00
1.24	1.39	0.00	97.50
1.28	1.39	0.00	97.50
1.32	1.39	0.00	97.50
1.36	1.39	0.00	97.50
1.40	1.39	0.00	97.50
1.44	1.39	0.00	97.50
1.48	1.39	0.00	97.50
1.52	1.39	0.00	97.50
1.56	1.39	0.00	97.50
1.60	1.39	0.00	97.50
1.64	1.39	0.00	97.50
1.68	1.39	0.00	97.50
1.72	1.39	0.00	97.50
1.76	1.40	0.00	100.00
1.80	1.41	0.00	102.50
1.84	1.41	0.00	102.50
1.88	1.39	0.00	97.50
1.92	1.40	0.00	100.00
1.96	1.40	0.00	100.00
2.00	1.40	0.00	100.00
2.04	1.40	0.00	100.00

Altran Report
962727-TR-01 Rev. 3
Att/Appx. E Sh E22

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.39	0.00	97.50
2.12	1.38	0.00	95.00
2.16	1.37	0.00	92.50
2.20	1.38	0.00	95.00
2.24	1.37	0.00	92.50
2.28	1.38	0.00	95.00
2.32	1.40	0.00	100.00
2.36	1.40	0.00	100.00
2.40	1.40	0.00	100.00
2.44	1.40	0.00	100.00
2.48	1.40	0.00	100.00
2.52	1.40	0.00	100.00
2.56	1.40	0.00	100.00
2.60	1.40	0.00	100.00
2.64	1.39	0.00	97.50
2.68	1.39	0.00	97.50
2.72	1.40	0.00	100.00
2.76	1.40	0.00	100.00
2.80	1.40	0.00	100.00
2.84	1.40	0.00	100.00
2.88	1.41	0.00	102.50
2.92	1.40	0.00	100.00
2.96	1.39	0.00	97.50
3.00	1.39	0.00	97.50
3.04	1.39	0.00	97.50
3.08	1.37	0.00	92.50
3.12	1.37	0.00	92.50
3.16	1.38	0.00	95.00
3.20	1.38	0.00	95.00
3.24	1.38	0.00	95.00
3.28	1.38	0.00	95.00
3.32	1.38	0.00	95.00
3.36	1.38	0.00	95.00
3.40	1.38	0.00	95.00
3.44	1.37	0.00	92.50
3.48	1.37	0.00	92.50
3.52	1.38	0.00	95.00
3.56	1.39	0.00	97.50
3.60	1.38	0.00	95.00
3.64	1.37	0.00	92.50
3.68	1.37	0.00	92.50
3.72	1.38	0.00	95.00
3.76	1.39	0.00	97.50
3.80	1.39	0.00	97.50
3.84	1.38	0.00	95.00
3.88	1.38	0.00	95.00
3.92	1.39	0.00	97.50
3.96	1.39	0.00	97.50
4.00	1.39	0.00	97.50
4.04	1.39	0.00	97.50
4.08	1.39	0.00	97.50
4.12	1.40	0.00	100.00

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.42	0.00	105.00
4.20	1.41	0.00	102.50
4.24	1.39	0.00	97.50
4.28	1.40	0.00	100.00
4.32	1.40	0.00	100.00
4.36	1.39	0.00	97.50
4.40	1.39	0.00	97.50
4.44	1.40	0.00	100.00
4.48	1.40	0.00	100.00
4.52	1.40	0.00	100.00
4.56	1.39	0.00	97.50
4.60	1.38	0.00	95.00
4.64	1.38	0.00	95.00
4.68	1.38	0.00	95.00
4.72	1.39	0.00	97.50
4.76	1.40	0.00	100.00
4.80	1.39	0.00	97.50
4.84	1.40	0.00	100.00
4.88	1.41	0.00	102.50
4.92	1.40	0.00	100.00
4.96	1.39	0.00	97.50
5.00	1.39	0.00	97.50
5.04	1.40	0.00	100.00
5.08	1.40	0.00	100.00
5.12	1.39	0.00	97.50
5.16	1.37	0.00	92.50
5.20	1.37	0.00	92.50
5.24	1.38	0.00	95.00
5.28	1.38	0.00	95.00
5.32	1.37	0.00	92.50
5.36	1.37	0.00	92.50
5.40	1.37	0.00	92.50
5.44	1.37	0.00	92.50
5.48	1.38	0.00	95.00
5.52	1.38	0.00	95.00
5.56	1.37	0.00	92.50
5.60	1.37	0.00	92.50
5.64	1.39	0.00	97.50
5.68	1.40	0.00	100.00
5.72	1.39	0.00	97.50
5.76	1.38	0.00	95.00
5.80	1.38	0.00	95.00
5.84	1.39	0.00	97.50
5.88	1.39	0.00	97.50
5.92	1.38	0.00	95.00
5.96	1.38	0.00	95.00
6.00	1.39	0.00	97.50
6.04	1.40	0.00	100.00
6.08	1.40	0.00	100.00
6.12	1.39	0.00	97.50
6.16	1.37	0.00	92.50
6.20	1.37	0.00	92.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E23

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.39	0.00	97.50
6.28	1.40	0.00	100.00
6.32	1.40	0.00	100.00
6.36	1.40	0.00	100.00
6.40	1.41	0.00	102.50
6.44	1.40	0.00	100.00
6.48	1.39	0.00	97.50
6.52	1.39	0.00	97.50
6.56	1.39	0.00	97.50
6.60	1.39	0.00	97.50
6.64	1.39	0.00	97.50
6.68	1.39	0.00	97.50
6.72	1.38	0.00	95.00
6.76	1.38	0.00	95.00
6.80	1.39	0.00	97.50
6.84	1.39	0.00	97.50
6.88	1.38	0.00	95.00
6.92	1.38	0.00	95.00
6.96	1.39	0.00	97.50
7.00	1.39	0.00	97.50
7.04	1.39	0.00	97.50
7.08	1.39	0.00	97.50
7.12	1.38	0.00	95.00
7.16	1.38	0.00	95.00
7.20	1.39	0.00	97.50
7.24	1.38	0.00	95.00
7.28	1.38	0.00	95.00
7.32	1.38	0.00	95.00
7.36	1.40	0.00	100.00
7.40	1.40	0.00	100.00
7.44	1.39	0.00	97.50
7.48	1.38	0.00	95.00
7.52	1.38	0.00	95.00
7.56	1.38	0.00	95.00
7.60	1.38	0.00	95.00
7.64	1.38	0.00	95.00
7.68	1.38	0.00	95.00
7.72	1.39	0.00	97.50
7.76	1.39	0.00	97.50
7.80	1.38	0.00	95.00
7.84	1.37	0.00	92.50
7.88	1.37	0.00	92.50
7.92	1.37	0.00	92.50
7.96	1.37	0.00	92.50
8.00	1.37	0.00	92.50
8.04	1.37	0.00	92.50
8.08	1.36	0.00	90.00
8.12	1.36	0.00	90.00
8.16	1.37	0.00	92.50
8.20	1.37	0.00	92.50
8.24	1.36	0.00	90.00
8.28	1.37	0.00	92.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E24

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.38	0.00	95.00
8.36	1.38	0.00	95.00
8.40	1.37	0.00	92.50
8.44	1.37	0.00	92.50
8.48	1.38	0.00	95.00
8.52	1.38	0.00	95.00
8.56	1.36	0.00	90.00
8.60	1.34	0.00	85.00
8.64	1.32	0.00	80.00
8.68	1.28	0.00	70.00
8.72	1.26	0.00	65.00
8.76	1.22	0.00	55.00
8.80	1.19	0.00	47.50
8.84	1.15	0.00	37.50
8.88	1.13	0.00	32.50
8.92	1.12	0.00	30.00
8.96	1.11	0.00	27.50
9.00	1.10	0.00	25.00
9.04	1.08	0.00	20.00
9.08	1.06	0.00	15.00
9.12	1.05	0.00	12.50
9.16	1.04	0.00	10.00
9.20	1.03	0.00	7.50
9.24	1.02	0.00	5.00
9.28	1.01	0.00	2.50
9.32	1.01	0.00	2.50
9.36	1.00	0.00	0.00
9.40	0.99	0.00	-2.50
9.44	0.98	0.00	-5.00
9.48	0.97	0.00	-7.50
9.52	0.96	0.00	-10.00
9.56	0.96	0.00	-10.00
9.60	0.96	0.00	-10.00
9.64	0.96	0.00	-10.00
9.68	0.95	0.00	-12.50
9.72	0.95	0.00	-12.50
9.76	0.94	0.00	-15.00
9.80	0.95	0.00	-12.50
9.84	0.95	0.00	-12.50
9.88	0.95	0.00	-12.50
9.92	0.95	0.00	-12.50
9.96	0.94	0.00	-15.00
10.00	0.95	0.00	-12.50
10.04	0.95	0.00	-12.50
10.08	0.95	0.00	-12.50
10.12	0.95	0.00	-12.50
10.16	0.94	0.00	-15.00
10.20	0.94	0.00	-15.00
10.24	0.93	0.00	-17.50
10.28	0.92	0.00	-20.00
10.32	0.93	0.00	-17.50
10.36	0.93	0.00	-17.50

Altran Report
962277-TR-01 Rev. 3
Att/Appx. E Sh E25

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	0.93	0.00	-17.50
10.44	0.93	0.00	-17.50
10.48	0.93	0.00	-17.50
10.52	0.92	0.00	-20.00
10.56	0.92	0.00	-20.00
10.60	0.92	0.00	-20.00
10.64	0.92	0.00	-20.00
10.68	0.92	0.00	-20.00
10.72	0.92	0.00	-20.00
10.76	0.92	0.00	-20.00
10.80	0.92	0.00	-20.00
10.84	0.93	0.00	-17.50
10.88	0.93	0.00	-17.50
10.92	0.92	0.00	-20.00
10.96	0.92	0.00	-20.00
11.00	0.92	0.00	-20.00
11.04	0.92	0.00	-20.00
11.08	0.91	0.00	-22.50
11.12	0.91	0.00	-22.50
11.16	0.90	0.00	-25.00
11.20	0.90	0.00	-25.00
11.24	0.90	0.00	-25.00
11.28	0.90	0.00	-25.00
11.32	0.90	0.00	-25.00
11.36	0.90	0.00	-25.00
11.40	0.91	0.00	-22.50
11.44	0.92	0.00	-20.00
11.48	0.92	0.00	-20.00
11.52	0.92	0.00	-20.00
11.56	0.92	0.00	-20.00
11.60	0.92	0.00	-20.00
11.64	0.92	0.00	-20.00
11.68	0.92	0.00	-20.00
11.72	0.92	0.00	-20.00
11.76	0.91	0.00	-22.50
11.80	0.91	0.00	-22.50
11.84	0.92	0.00	-20.00
11.88	0.92	0.00	-20.00
11.92	0.92	0.00	-20.00
11.96	0.92	0.00	-20.00
12.00	0.92	0.00	-20.00
12.04	0.92	0.00	-20.00
12.08	0.91	0.00	-22.50
12.12	0.91	0.00	-22.50
12.16	0.92	0.00	-20.00
12.20	0.92	0.00	-20.00
12.24	0.92	0.00	-20.00
12.28	0.92	0.00	-20.00
12.32	0.91	0.00	-22.50
12.36	0.92	0.00	-20.00
12.40	0.92	0.00	-20.00
12.44	0.91	0.00	-22.50

Altran Report
9622 TR-01 Rev. 3
Att/Appx. E Sh E26

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 8 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	0.91	0.00	-22.50
12.52	0.91	0.00	-22.50
12.56	0.91	0.00	-22.50
12.60	0.91	0.00	-22.50
12.64	0.91	0.00	-22.50
12.68	0.91	0.00	-22.50
12.72	0.91	0.00	-22.50
12.76	0.92	0.00	-20.00
12.80	0.91	0.00	-22.50
12.84	0.91	0.00	-22.50
12.88	0.91	0.00	-22.50
12.92	0.91	0.00	-22.50
12.96	0.90	0.00	-25.00
13.00	0.90	0.00	-25.00
13.04	0.90	0.00	-25.00
13.08	0.90	0.00	-25.00
13.12	0.90	0.00	-25.00
13.16	0.90	0.00	-25.00
13.20	0.89	0.00	-27.50
13.24	0.89	0.00	-27.50
13.28	0.90	0.00	-25.00
13.32	0.89	0.00	-27.50
13.36	0.89	0.00	-27.50
13.40	0.88	0.00	-30.00
13.44	0.88	0.00	-30.00
13.48	0.88	0.00	-30.00
13.52	0.89	0.00	-27.50
13.56	0.88	0.00	-30.00
13.60	0.90	0.00	-25.00
13.64	0.89	0.00	-27.50
13.68	0.89	0.00	-27.50
13.72	0.89	0.00	-27.50
13.76	0.88	0.00	-30.00
13.80	0.89	0.00	-27.50
13.84	0.88	0.00	-30.00
13.88	0.89	0.00	-27.50
13.92	0.88	0.00	-30.00
13.96	0.88	0.00	-30.00
14.00	0.89	0.00	-27.50
14.04	0.89	0.00	-27.50
14.08	0.89	0.00	-27.50
14.12	0.89	0.00	-27.50
14.16	0.89	0.00	-27.50
14.20	0.89	0.00	-27.50
14.24	0.89	0.00	-27.50
14.28	0.89	0.00	-27.50
14.32	0.90	0.00	-25.00
14.36	0.89	0.00	-27.50
14.40	0.89	0.00	-27.50
14.44	0.90	0.00	-25.00
14.48	0.89	0.00	-27.50
14.52	0.89	0.00	-27.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh 527

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	0.89	0.00	-27.50
14.60	0.90	0.00	-25.00
14.64	0.90	0.00	-25.00
14.68	0.90	0.00	-25.00
14.72	0.91	0.00	-22.50
14.76	0.91	0.00	-22.50
14.80	0.91	0.00	-22.50
14.84	0.90	0.00	-25.00
14.88	0.90	0.00	-25.00
14.92	0.91	0.00	-22.50
14.96	0.90	0.00	-25.00
15.00	0.90	0.00	-25.00
15.04	0.91	0.00	-22.50
15.08	0.90	0.00	-25.00
15.12	0.90	0.00	-25.00
15.16	0.90	0.00	-25.00
15.20	0.89	0.00	-27.50
15.24	0.90	0.00	-25.00
15.28	0.89	0.00	-27.50
15.32	0.89	0.00	-27.50
15.36	0.88	0.00	-30.00
15.40	0.89	0.00	-27.50
15.44	0.90	0.00	-25.00
15.48	0.90	0.00	-25.00
15.52	0.90	0.00	-25.00
15.56	0.90	0.00	-25.00
15.60	0.90	0.00	-25.00
15.64	0.90	0.00	-25.00
15.68	0.89	0.00	-27.50
15.72	0.89	0.00	-27.50
15.76	0.90	0.00	-25.00
15.80	0.90	0.00	-25.00
15.84	0.90	0.00	-25.00
15.88	0.90	0.00	-25.00
15.92	0.90	0.00	-25.00
15.96	0.90	0.00	-25.00
16.00	0.90	0.00	-25.00
16.04	0.90	0.00	-25.00
16.08	0.89	0.00	-27.50
16.12	0.89	0.00	-27.50
16.16	0.90	0.00	-25.00
16.20	0.89	0.00	-27.50
16.24	0.90	0.00	-25.00
16.28	0.90	0.00	-25.00
16.32	0.90	0.00	-25.00
16.36	0.90	0.00	-25.00
16.40	0.90	0.00	-25.00
16.44	0.90	0.00	-25.00
16.48	0.91	0.00	-22.50
16.52	0.90	0.00	-25.00
16.56	0.90	0.00	-25.00
16.60	0.90	0.00	-25.00

Altran
96227-TR-01 Rev. 3
Att/Appx. E Sh E28

Altran Report
96227-SR-01 Rev. 3
Att./Appx. E Sh. E29

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	0.90	0.00	-25.00
16.68	0.90	0.00	-25.00
16.72	0.90	0.00	-25.00
16.76	0.91	0.00	-22.50
16.80	0.91	0.00	-22.50
16.84	0.91	0.00	-22.50
16.88	0.92	0.00	-20.00
16.92	0.92	0.00	-20.00
16.96	0.91	0.00	-22.50
17.00	0.91	0.00	-22.50
17.04	0.91	0.00	-22.50
17.08	0.91	0.00	-22.50
17.12	0.90	0.00	-25.00
17.16	0.90	0.00	-25.00
17.20	0.91	0.00	-22.50
17.24	0.90	0.00	-25.00
17.28	0.90	0.00	-25.00
17.32	0.89	0.00	-27.50
17.36	0.89	0.00	-27.50
17.40	0.90	0.00	-25.00
17.44	0.90	0.00	-25.00
17.48	0.90	0.00	-25.00
17.52	0.90	0.00	-25.00
17.56	0.90	0.00	-25.00
17.60	0.90	0.00	-25.00
17.64	0.89	0.00	-27.50
17.68	0.89	0.00	-27.50
17.72	0.89	0.00	-27.50
17.76	0.90	0.00	-25.00
17.80	0.90	0.00	-25.00
17.84	0.90	0.00	-25.00
17.88	0.90	0.00	-25.00
17.92	0.90	0.00	-25.00
17.96	0.90	0.00	-25.00
18.00	0.90	0.00	-25.00
18.04	0.90	0.00	-25.00
18.08	0.90	0.00	-25.00
18.12	0.90	0.00	-25.00
18.16	0.89	0.00	-27.50
18.20	0.89	0.00	-27.50
18.24	0.89	0.00	-27.50
18.28	0.89	0.00	-27.50
18.32	0.89	0.00	-27.50
18.36	0.89	0.00	-27.50
18.40	0.90	0.00	-25.00
18.44	0.90	0.00	-25.00
18.48	0.90	0.00	-25.00
18.52	0.89	0.00	-27.50
18.56	0.88	0.00	-30.00
18.60	0.89	0.00	-27.50
18.64	0.90	0.00	-25.00
18.68	0.89	0.00	-27.50

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
18.72	0.90	0.00	-25.00
18.76	0.89	0.00	-27.50
18.80	0.89	0.00	-27.50
18.84	0.90	0.00	-25.00
18.88	0.89	0.00	-27.50
18.92	0.90	0.00	-25.00
18.96	0.90	0.00	-25.00
19.00	0.91	0.00	-22.50
19.04	0.91	0.00	-22.50
19.08	0.91	0.00	-22.50
19.12	0.90	0.00	-25.00
19.16	0.90	0.00	-25.00
19.20	0.90	0.00	-25.00
19.24	0.90	0.00	-25.00
19.28	0.90	0.00	-25.00
19.32	0.90	0.00	-25.00
19.36	0.90	0.00	-25.00
19.40	0.89	0.00	-27.50
19.44	0.90	0.00	-25.00
19.48	0.89	0.00	-27.50
19.52	0.89	0.00	-27.50
19.56	0.89	0.00	-27.50
19.60	0.89	0.00	-27.50
19.64	0.89	0.00	-27.50
19.68	0.89	0.00	-27.50
19.72	0.90	0.00	-25.00
19.76	0.90	0.00	-25.00
19.80	0.90	0.00	-25.00
19.84	0.90	0.00	-25.00
19.88	0.90	0.00	-25.00
19.92	0.90	0.00	-25.00
19.96	0.90	0.00	-25.00
20.00	0.89	0.00	-27.50
20.04	0.90	0.00	-25.00
20.08	0.90	0.00	-25.00
20.12	0.89	0.00	-27.50
20.16	0.90	0.00	-25.00
20.20	0.90	0.00	-25.00
20.24	0.90	0.00	-25.00
20.28	0.90	0.00	-25.00
20.32	0.89	0.00	-27.50
20.36	0.88	0.00	-30.00
20.40	0.88	0.00	-30.00
20.44	0.89	0.00	-27.50
20.48	0.89	0.00	-27.50
20.52	0.89	0.00	-27.50
20.56	0.89	0.00	-27.50
20.60	0.89	0.00	-27.50
20.64	0.89	0.00	-27.50
20.68	0.89	0.00	-27.50
20.72	0.89	0.00	-27.50
20.76	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh. E30

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	0.89	0.00	-27.50
20.84	0.89	0.00	-27.50
20.88	0.89	0.00	-27.50
20.92	0.88	0.00	-30.00
20.96	0.89	0.00	-27.50
21.00	0.89	0.00	-27.50
21.04	0.89	0.00	-27.50
21.08	0.89	0.00	-27.50
21.12	0.89	0.00	-27.50
21.16	0.90	0.00	-25.00
21.20	0.90	0.00	-25.00
21.24	0.90	0.00	-25.00
21.28	0.90	0.00	-25.00
21.32	0.90	0.00	-25.00
21.36	0.90	0.00	-25.00
21.40	0.90	0.00	-25.00
21.44	0.90	0.00	-25.00
21.48	0.91	0.00	-22.50
21.52	0.91	0.00	-22.50
21.56	0.91	0.00	-22.50
21.60	0.90	0.00	-25.00
21.64	0.89	0.00	-27.50
21.68	0.90	0.00	-25.00
21.72	0.89	0.00	-27.50
21.76	0.89	0.00	-27.50
21.80	0.89	0.00	-27.50
21.84	0.89	0.00	-27.50
21.88	0.90	0.00	-25.00
21.92	0.90	0.00	-25.00
21.96	0.89	0.00	-27.50
22.00	0.89	0.00	-27.50
22.04	0.89	0.00	-27.50
22.08	0.90	0.00	-25.00
22.12	0.90	0.00	-25.00
22.16	0.89	0.00	-27.50
22.20	0.90	0.00	-25.00
22.24	0.90	0.00	-25.00
22.28	0.90	0.00	-25.00
22.32	0.90	0.00	-25.00
22.36	0.90	0.00	-25.00
22.40	0.91	0.00	-22.50
22.44	0.90	0.00	-25.00
22.48	0.90	0.00	-25.00
22.52	0.90	0.00	-25.00
22.56	0.90	0.00	-25.00
22.60	0.91	0.00	-22.50
22.64	0.90	0.00	-25.00
22.68	0.90	0.00	-25.00
22.72	0.90	0.00	-25.00
22.76	0.90	0.00	-25.00
22.80	0.91	0.00	-22.50
22.84	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.88	0.89	0.00	-27.50
22.92	0.91	0.00	-22.50
22.96	0.90	0.00	-25.00
23.00	0.90	0.00	-25.00
23.04	0.91	0.00	-22.50
23.08	0.90	0.00	-25.00
23.12	0.91	0.00	-22.50
23.16	0.90	0.00	-25.00
23.20	0.90	0.00	-25.00
23.24	0.90	0.00	-25.00
23.28	0.89	0.00	-27.50
23.32	0.90	0.00	-25.00
23.36	0.90	0.00	-25.00
23.40	0.90	0.00	-25.00
23.44	0.90	0.00	-25.00
23.48	0.90	0.00	-25.00
23.52	0.90	0.00	-25.00
23.56	0.90	0.00	-25.00
23.60	0.90	0.00	-25.00
23.64	0.90	0.00	-25.00
23.68	0.90	0.00	-25.00
23.72	0.90	0.00	-25.00
23.76	0.90	0.00	-25.00
23.80	0.90	0.00	-25.00
23.84	0.89	0.00	-27.50
23.88	0.90	0.00	-25.00
23.92	0.91	0.00	-22.50
23.96	0.90	0.00	-25.00
24.00	0.91	0.00	-22.50
24.04	0.91	0.00	-22.50
24.08	0.90	0.00	-25.00
24.12	0.90	0.00	-25.00
24.16	0.90	0.00	-25.00
24.20	0.90	0.00	-25.00
24.24	0.90	0.00	-25.00
24.28	0.90	0.00	-25.00
24.32	0.90	0.00	-25.00
24.36	0.90	0.00	-25.00
24.40	0.90	0.00	-25.00
24.44	0.90	0.00	-25.00
24.48	0.90	0.00	-25.00
24.52	0.89	0.00	-27.50
24.56	0.90	0.00	-25.00
24.60	0.90	0.00	-25.00
24.64	0.90	0.00	-25.00
24.68	0.90	0.00	-25.00
24.72	0.90	0.00	-25.00
24.76	0.90	0.00	-25.00
24.80	0.90	0.00	-25.00
24.84	0.89	0.00	-27.50
24.88	0.89	0.00	-27.50
24.92	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Alt./Appx. E Sn. E32

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.96	0.90	0.00	-25.00
25.00	0.90	0.00	-25.00
25.04	0.91	0.00	-22.50
25.08	0.91	0.00	-22.50
25.12	0.90	0.00	-25.00
25.16	0.90	0.00	-25.00
25.20	0.90	0.00	-25.00
25.24	0.89	0.00	-27.50
25.28	0.89	0.00	-27.50
25.32	0.89	0.00	-27.50
25.36	0.89	0.00	-27.50
25.40	0.89	0.00	-27.50
25.44	0.90	0.00	-25.00
25.48	0.90	0.00	-25.00
25.52	0.90	0.00	-25.00
25.56	0.91	0.00	-22.50
25.60	0.91	0.00	-22.50
25.64	0.91	0.00	-22.50
25.68	0.91	0.00	-22.50
25.72	0.90	0.00	-25.00
25.76	0.90	0.00	-25.00
25.80	0.91	0.00	-22.50
25.84	0.90	0.00	-25.00
25.88	0.91	0.00	-22.50
25.92	0.91	0.00	-22.50
25.96	0.91	0.00	-22.50
26.00	0.91	0.00	-22.50
26.04	0.91	0.00	-22.50
26.08	0.91	0.00	-22.50
26.12	0.90	0.00	-25.00
26.16	0.90	0.00	-25.00
26.20	0.91	0.00	-22.50
26.24	0.90	0.00	-25.00
26.28	0.90	0.00	-25.00
26.32	0.91	0.00	-22.50
26.36	0.91	0.00	-22.50
26.40	0.92	0.00	-20.00
26.44	0.92	0.00	-20.00
26.48	0.91	0.00	-22.50
26.52	0.92	0.00	-20.00
26.56	0.92	0.00	-20.00
26.60	0.92	0.00	-20.00
26.64	0.91	0.00	-22.50
26.68	0.90	0.00	-25.00
26.72	0.91	0.00	-22.50
26.76	0.91	0.00	-22.50
26.80	0.92	0.00	-20.00
26.84	0.91	0.00	-22.50
26.88	0.91	0.00	-22.50
26.92	0.92	0.00	-20.00
26.96	0.92	0.00	-20.00
27.00	0.92	0.00	-20.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E33

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.04	0.92	0.00	-20.00
27.08	0.92	0.00	-20.00
27.12	0.92	0.00	-20.00
27.16	0.91	0.00	-22.50
27.20	0.91	0.00	-22.50
27.24	0.91	0.00	-22.50
27.28	0.90	0.00	-25.00
27.32	0.90	0.00	-25.00
27.36	0.90	0.00	-25.00
27.40	0.89	0.00	-27.50
27.44	0.89	0.00	-27.50
27.48	0.89	0.00	-27.50
27.52	0.90	0.00	-25.00
27.56	0.89	0.00	-27.50
27.60	0.89	0.00	-27.50
27.64	0.90	0.00	-25.00
27.68	0.90	0.00	-25.00
27.72	0.90	0.00	-25.00
27.76	0.89	0.00	-27.50
27.80	0.89	0.00	-27.50
27.84	0.89	0.00	-27.50
27.88	0.90	0.00	-25.00
27.92	0.89	0.00	-27.50
27.96	0.90	0.00	-25.00
28.00	0.90	0.00	-25.00
28.04	0.90	0.00	-25.00
28.08	0.90	0.00	-25.00
28.12	0.89	0.00	-27.50
28.16	0.90	0.00	-25.00
28.20	0.89	0.00	-27.50
28.24	0.90	0.00	-25.00
28.28	0.90	0.00	-25.00
28.32	0.90	0.00	-25.00
28.36	0.90	0.00	-25.00
28.40	0.90	0.00	-25.00
28.44	0.90	0.00	-25.00
28.48	0.89	0.00	-27.50
28.52	0.89	0.00	-27.50
28.56	0.89	0.00	-27.50
28.60	0.89	0.00	-27.50
28.64	0.89	0.00	-27.50
28.68	0.89	0.00	-27.50
28.72	0.89	0.00	-27.50
28.76	0.89	0.00	-27.50
28.80	0.89	0.00	-27.50
28.84	0.90	0.00	-25.00
28.88	0.90	0.00	-25.00
28.92	0.89	0.00	-27.50
28.96	0.89	0.00	-27.50
29.00	0.89	0.00	-27.50
29.04	0.90	0.00	-25.00
29.08	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E34

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.12	0.90	0.00	-25.00
29.16	0.90	0.00	-25.00
29.20	0.90	0.00	-25.00
29.24	0.90	0.00	-25.00
29.28	0.90	0.00	-25.00
29.32	0.90	0.00	-25.00
29.36	0.90	0.00	-25.00
29.40	0.90	0.00	-25.00
29.44	0.89	0.00	-27.50
29.48	0.90	0.00	-25.00
29.52	0.90	0.00	-25.00
29.56	0.90	0.00	-25.00
29.60	0.90	0.00	-25.00
29.64	0.89	0.00	-27.50
29.68	0.89	0.00	-27.50
29.72	0.90	0.00	-25.00
29.76	0.89	0.00	-27.50
29.80	0.90	0.00	-25.00
29.84	0.89	0.00	-27.50
29.88	0.89	0.00	-27.50
29.92	0.90	0.00	-25.00
29.96	0.90	0.00	-25.00
30.00	0.89	0.00	-27.50
30.04	0.89	0.00	-27.50
30.08	0.90	0.00	-25.00
30.12	0.89	0.00	-27.50
30.16	0.89	0.00	-27.50
30.20	0.89	0.00	-27.50
30.24	0.89	0.00	-27.50
30.28	0.90	0.00	-25.00
30.32	0.90	0.00	-25.00
30.36	0.90	0.00	-25.00
30.40	0.90	0.00	-25.00
30.44	0.90	0.00	-25.00
30.48	0.90	0.00	-25.00
30.52	0.91	0.00	-22.50
30.56	0.91	0.00	-22.50
30.60	0.91	0.00	-22.50
30.64	0.91	0.00	-22.50
30.68	0.91	0.00	-22.50
30.72	0.91	0.00	-22.50
30.76	0.91	0.00	-22.50
30.80	0.91	0.00	-22.50
30.84	0.91	0.00	-22.50
30.88	0.91	0.00	-22.50
30.92	0.91	0.00	-22.50
30.96	0.90	0.00	-25.00
31.00	0.91	0.00	-22.50
31.04	0.91	0.00	-22.50
31.08	0.91	0.00	-22.50
31.12	0.91	0.00	-22.50
31.16	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh E35

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
31.20	0.90	0.00	-25.00
31.24	0.90	0.00	-25.00
31.28	0.90	0.00	-25.00
31.32	0.90	0.00	-25.00
31.36	0.90	0.00	-25.00
31.40	0.90	0.00	-25.00
31.44	0.90	0.00	-25.00
31.48	0.90	0.00	-25.00
31.52	0.90	0.00	-25.00
31.56	0.89	0.00	-27.50
31.60	0.89	0.00	-27.50
31.64	0.89	0.00	-27.50
31.68	0.90	0.00	-25.00
31.72	0.90	0.00	-25.00
31.76	0.89	0.00	-27.50
31.80	0.90	0.00	-25.00
31.84	0.90	0.00	-25.00
31.88	0.90	0.00	-25.00
31.92	0.90	0.00	-25.00
31.96	0.90	0.00	-25.00
32.00	0.90	0.00	-25.00
32.04	0.89	0.00	-27.50
32.08	0.89	0.00	-27.50
32.12	0.89	0.00	-27.50
32.16	0.89	0.00	-27.50
32.20	0.89	0.00	-27.50
32.24	0.89	0.00	-27.50
32.28	0.88	0.00	-30.00
32.32	0.89	0.00	-27.50
32.36	0.89	0.00	-27.50
32.40	0.90	0.00	-25.00
32.44	0.89	0.00	-27.50
32.48	0.88	0.00	-30.00
32.52	0.88	0.00	-30.00
32.56	0.89	0.00	-27.50
32.60	0.89	0.00	-27.50
32.64	0.89	0.00	-27.50
32.68	0.89	0.00	-27.50
32.72	0.90	0.00	-25.00
32.76	0.90	0.00	-25.00
32.80	0.90	0.00	-25.00
32.84	0.90	0.00	-25.00
32.88	0.90	0.00	-25.00
32.92	0.89	0.00	-27.50
32.96	0.89	0.00	-27.50
33.00	0.90	0.00	-25.00
33.04	0.89	0.00	-27.50
33.08	0.89	0.00	-27.50
33.12	0.90	0.00	-25.00
33.16	0.90	0.00	-25.00
33.20	0.90	0.00	-25.00
33.24	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E36

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
33.28	0.89	0.00	-27.50
33.32	0.89	0.00	-27.50
33.36	0.89	0.00	-27.50
33.40	0.88	0.00	-30.00
33.44	0.88	0.00	-30.00
33.48	0.89	0.00	-27.50
33.52	0.89	0.00	-27.50
33.56	0.89	0.00	-27.50
33.60	0.90	0.00	-25.00
33.64	0.89	0.00	-27.50
33.68	0.89	0.00	-27.50
33.72	0.89	0.00	-27.50
33.76	0.88	0.00	-30.00
33.80	0.88	0.00	-30.00
33.84	0.88	0.00	-30.00
33.88	0.88	0.00	-30.00
33.92	0.88	0.00	-30.00
33.96	0.88	0.00	-30.00
34.00	0.88	0.00	-30.00
34.04	0.89	0.00	-27.50
34.08	0.89	0.00	-27.50
34.12	0.88	0.00	-30.00
34.16	0.88	0.00	-30.00
34.20	0.88	0.00	-30.00
34.24	0.88	0.00	-30.00
34.28	0.88	0.00	-30.00
34.32	0.89	0.00	-27.50
34.36	0.89	0.00	-27.50
34.40	0.89	0.00	-27.50
34.44	0.89	0.00	-27.50
34.48	0.89	0.00	-27.50
34.52	0.89	0.00	-27.50
34.56	0.89	0.00	-27.50
34.60	0.90	0.00	-25.00
34.64	0.90	0.00	-25.00
34.68	0.90	0.00	-25.00
34.72	0.89	0.00	-27.50
34.76	0.88	0.00	-30.00
34.80	0.88	0.00	-30.00
34.84	0.88	0.00	-30.00
34.88	0.89	0.00	-27.50
34.92	0.90	0.00	-25.00
34.96	0.90	0.00	-25.00
35.00	0.90	0.00	-25.00
35.04	0.90	0.00	-25.00
35.08	0.90	0.00	-25.00
35.12	0.90	0.00	-25.00
35.16	0.90	0.00	-25.00
35.20	0.90	0.00	-25.00
35.24	0.90	0.00	-25.00
35.28	0.90	0.00	-25.00
35.32	0.89	0.00	-27.50

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh E37

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
35.36	0.88	0.00	-30.00
35.40	0.88	0.00	-30.00
35.44	0.89	0.00	-27.50
35.48	0.89	0.00	-27.50
35.52	0.90	0.00	-25.00
35.56	0.90	0.00	-25.00
35.60	0.90	0.00	-25.00
35.64	0.90	0.00	-25.00
35.68	0.90	0.00	-25.00
35.72	0.90	0.00	-25.00
35.76	0.90	0.00	-25.00
35.80	0.89	0.00	-27.50
35.84	0.88	0.00	-30.00
35.88	0.89	0.00	-27.50
35.92	0.89	0.00	-27.50
35.96	0.90	0.00	-25.00
36.00	0.90	0.00	-25.00
36.04	0.90	0.00	-25.00
36.08	0.90	0.00	-25.00
36.12	0.90	0.00	-25.00
36.16	0.90	0.00	-25.00
36.20	0.90	0.00	-25.00
36.24	0.90	0.00	-25.00
36.28	0.90	0.00	-25.00
36.32	0.90	0.00	-25.00
36.36	0.90	0.00	-25.00
36.40	0.90	0.00	-25.00
36.44	0.90	0.00	-25.00
36.48	0.90	0.00	-25.00
36.52	0.90	0.00	-25.00
36.56	0.90	0.00	-25.00
36.60	0.90	0.00	-25.00
36.64	0.90	0.00	-25.00
36.68	0.90	0.00	-25.00
36.72	0.90	0.00	-25.00
36.76	0.89	0.00	-27.50
36.80	0.89	0.00	-27.50
36.84	0.88	0.00	-30.00
36.88	0.89	0.00	-27.50
36.92	0.89	0.00	-27.50
36.96	0.89	0.00	-27.50
37.00	0.89	0.00	-27.50
37.04	0.89	0.00	-27.50
37.08	0.90	0.00	-25.00
37.12	0.90	0.00	-25.00
37.16	0.90	0.00	-25.00
37.20	0.89	0.00	-27.50
37.24	0.89	0.00	-27.50
37.28	0.89	0.00	-27.50
37.32	0.90	0.00	-25.00
37.36	0.90	0.00	-25.00
37.40	0.90	0.00	-25.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E38

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
37.44	0.89	0.00	-27.50
37.48	0.89	0.00	-27.50
37.52	0.89	0.00	-27.50
37.56	0.89	0.00	-27.50
37.60	0.90	0.00	-25.00
37.64	0.89	0.00	-27.50
37.68	0.89	0.00	-27.50
37.72	0.89	0.00	-27.50
37.76	0.89	0.00	-27.50
37.80	0.89	0.00	-27.50
37.84	0.90	0.00	-25.00
37.88	0.89	0.00	-27.50
37.92	0.89	0.00	-27.50
37.96	0.89	0.00	-27.50
38.00	0.89	0.00	-27.50
38.04	0.89	0.00	-27.50
38.08	0.89	0.00	-27.50
38.12	0.89	0.00	-27.50
38.16	0.89	0.00	-27.50
38.20	0.89	0.00	-27.50
38.24	0.89	0.00	-27.50
38.28	0.89	0.00	-27.50
38.32	0.90	0.00	-25.00
38.36	0.90	0.00	-25.00
38.40	0.90	0.00	-25.00
38.44	0.90	0.00	-25.00
38.48	0.90	0.00	-25.00
38.52	0.91	0.00	-22.50
38.56	0.91	0.00	-22.50
38.60	0.91	0.00	-22.50
38.64	0.90	0.00	-25.00
38.68	0.90	0.00	-25.00
38.72	0.89	0.00	-27.50
38.76	0.89	0.00	-27.50
38.80	0.89	0.00	-27.50
38.84	0.89	0.00	-27.50
38.88	0.89	0.00	-27.50
38.92	0.90	0.00	-25.00
38.96	0.89	0.00	-27.50
39.00	0.88	0.00	-30.00
39.04	0.88	0.00	-30.00
39.08	0.88	0.00	-30.00
39.12	0.88	0.00	-30.00
39.16	0.89	0.00	-27.50
39.20	0.89	0.00	-27.50
39.24	0.88	0.00	-30.00
39.28	0.89	0.00	-27.50
39.32	0.90	0.00	-25.00
39.36	0.90	0.00	-25.00
39.40	0.90	0.00	-25.00
39.44	0.90	0.00	-25.00
39.48	0.90	0.00	-25.00

Altran Report
962277-TR-01 Rev. 3
Att./Appx. E Sh E29

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 21 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
39.52	0.90	0.00	-25.00
39.56	0.90	0.00	-25.00
39.60	0.90	0.00	-25.00
39.64	0.90	0.00	-25.00
39.68	0.90	0.00	-25.00
39.72	0.90	0.00	-25.00
39.76	0.90	0.00	-25.00
39.80	0.90	0.00	-25.00
39.84	0.90	0.00	-25.00
39.88	0.90	0.00	-25.00
39.92	0.90	0.00	-25.00
39.96	0.90	0.00	-25.00
40.00	0.90	0.00	-25.00
40.04	0.89	0.00	-27.50
40.08	0.88	0.00	-30.00
40.12	0.88	0.00	-30.00
40.16	0.88	0.00	-30.00
40.20	0.89	0.00	-27.50
40.24	0.88	0.00	-30.00
40.28	0.89	0.00	-27.50
40.32	0.89	0.00	-27.50
40.36	0.89	0.00	-27.50
40.40	0.89	0.00	-27.50
40.44	0.89	0.00	-27.50
40.48	0.89	0.00	-27.50
40.52	0.89	0.00	-27.50
40.56	0.88	0.00	-30.00
40.60	0.89	0.00	-27.50
40.64	0.88	0.00	-30.00
40.68	0.89	0.00	-27.50
40.72	0.89	0.00	-27.50
40.76	0.89	0.00	-27.50
40.80	0.89	0.00	-27.50
40.84	0.88	0.00	-30.00
40.88	0.88	0.00	-30.00
40.92	0.87	0.00	-32.50
40.96	0.87	0.00	-32.50
41.00	0.88	0.00	-30.00
41.04	0.88	0.00	-30.00
41.08	0.88	0.00	-30.00
41.12	0.89	0.00	-27.50
41.16	0.89	0.00	-27.50
41.20	0.89	0.00	-27.50
41.24	0.89	0.00	-27.50
41.28	0.89	0.00	-27.50
41.32	0.89	0.00	-27.50
41.36	0.89	0.00	-27.50
41.40	0.90	0.00	-25.00
41.44	0.90	0.00	-25.00
41.48	0.90	0.00	-25.00
41.52	0.89	0.00	-27.50
41.56	0.89	0.00	-27.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx E Sh E40

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
41.60	0.89	0.00	-27.50
41.64	0.88	0.00	-30.00
41.68	0.88	0.00	-30.00
41.72	0.88	0.00	-30.00
41.76	0.88	0.00	-30.00
41.80	0.88	0.00	-30.00
41.84	0.88	0.00	-30.00
41.88	0.88	0.00	-30.00
41.92	0.88	0.00	-30.00
41.96	0.88	0.00	-30.00
42.00	0.88	0.00	-30.00
42.04	0.89	0.00	-27.50
42.08	0.89	0.00	-27.50
42.12	0.88	0.00	-30.00
42.16	0.88	0.00	-30.00
42.20	0.88	0.00	-30.00
42.24	0.88	0.00	-30.00
42.28	0.88	0.00	-30.00
42.32	0.89	0.00	-27.50
42.36	0.89	0.00	-27.50
42.40	0.90	0.00	-25.00
42.44	0.89	0.00	-27.50
42.48	0.89	0.00	-27.50
42.52	0.89	0.00	-27.50
42.56	0.89	0.00	-27.50
42.60	0.89	0.00	-27.50
42.64	0.89	0.00	-27.50
42.68	0.88	0.00	-30.00
42.72	0.88	0.00	-30.00
42.76	0.88	0.00	-30.00
42.80	0.88	0.00	-30.00
42.84	0.88	0.00	-30.00
42.88	0.89	0.00	-27.50
42.92	0.88	0.00	-30.00
42.96	0.88	0.00	-30.00
43.00	0.88	0.00	-30.00
43.04	0.88	0.00	-30.00
43.08	0.88	0.00	-30.00
43.12	0.88	0.00	-30.00
43.16	0.88	0.00	-30.00
43.20	0.89	0.00	-27.50
43.24	0.90	0.00	-25.00
43.28	0.92	0.00	-20.00
43.32	0.93	0.00	-17.50
43.36	0.93	0.00	-17.50
43.40	0.94	0.00	-15.00
43.44	0.95	0.00	-12.50
43.48	0.95	0.00	-12.50
43.52	0.96	0.00	-10.00
43.56	0.96	0.00	-10.00
43.60	0.97	0.00	-7.50
43.64	0.97	0.00	-7.50

Altran: [illegible]
96227-TR-01 Rev. 3
Att./Appx. E Sh. E41

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 23 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
43.68	0.98	0.00	-5.00
43.72	0.98	0.00	-5.00
43.76	0.98	0.00	-5.00
43.80	0.99	0.00	-2.50
43.84	0.99	0.00	-2.50
43.88	1.00	0.00	0.00
43.92	1.00	0.00	0.00
43.96	1.00	0.00	0.00
44.00	1.00	0.00	0.00
44.04	0.99	0.00	-2.50
44.08	1.00	0.00	0.00
44.12	1.01	0.00	2.50
44.16	1.01	0.00	2.50
44.20	1.01	0.00	2.50
44.24	1.01	0.00	2.50
44.28	1.01	0.00	2.50
44.32	1.01	0.00	2.50
44.36	1.01	0.00	2.50
44.40	1.01	0.00	2.50
44.44	1.01	0.00	2.50
44.48	1.01	0.00	2.50
44.52	1.01	0.00	2.50
44.56	1.01	0.00	2.50
44.60	1.01	0.00	2.50
44.64	1.01	0.00	2.50
44.68	1.02	0.00	5.00
44.72	1.02	0.00	5.00
44.76	1.02	0.00	5.00
44.80	1.02	0.00	5.00
44.84	1.02	0.00	5.00
44.88	1.02	0.00	5.00
44.92	1.02	0.00	5.00
44.96	1.02	0.00	5.00
45.00	1.03	0.00	7.50
45.04	1.03	0.00	7.50
45.08	1.03	0.00	7.50
45.12	1.03	0.00	7.50
45.16	1.03	0.00	7.50
45.20	1.03	0.00	7.50
45.24	1.03	0.00	7.50
45.28	1.03	0.00	7.50
45.32	1.04	0.00	10.00
45.36	1.04	0.00	10.00
45.40	1.04	0.00	10.00
45.44	1.04	0.00	10.00
45.48	1.04	0.00	10.00
45.52	1.03	0.00	7.50
45.56	1.03	0.00	7.50
45.60	1.03	0.00	7.50
45.64	1.03	0.00	7.50
45.68	1.03	0.00	7.50
45.72	1.03	0.00	7.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E42

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 24 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
45.76	1.03	0.00	7.50
45.80	1.03	0.00	7.50
45.84	1.02	0.00	5.00
45.88	1.02	0.00	5.00
45.92	1.02	0.00	5.00
45.96	1.02	0.00	5.00
46.00	1.02	0.00	5.00
46.04	1.03	0.00	7.50
46.08	1.03	0.00	7.50
46.12	1.03	0.00	7.50
46.16	1.02	0.00	5.00
46.20	1.02	0.00	5.00
46.24	1.02	0.00	5.00
46.28	1.02	0.00	5.00
46.32	1.02	0.00	5.00
46.36	1.02	0.00	5.00
46.40	1.03	0.00	7.50
46.44	1.03	0.00	7.50
46.48	1.03	0.00	7.50
46.52	1.03	0.00	7.50
46.56	1.03	0.00	7.50
46.60	1.03	0.00	7.50
46.64	1.03	0.00	7.50
46.68	1.04	0.00	10.00
46.72	1.03	0.00	7.50
46.76	1.03	0.00	7.50
46.80	1.03	0.00	7.50
46.84	1.03	0.00	7.50
46.88	1.03	0.00	7.50
46.92	1.04	0.00	10.00
46.96	1.03	0.00	7.50
47.00	1.03	0.00	7.50
47.04	1.03	0.00	7.50
47.08	1.04	0.00	10.00
47.12	1.05	0.00	12.50
47.16	1.05	0.00	12.50
47.20	1.05	0.00	12.50
47.24	1.03	0.00	7.50
47.28	1.03	0.00	7.50
47.32	1.04	0.00	10.00
47.36	1.04	0.00	10.00
47.40	1.05	0.00	12.50
47.44	1.05	0.00	12.50
47.48	1.04	0.00	10.00
47.52	1.05	0.00	12.50
47.56	1.08	0.00	20.00
47.60	1.13	0.00	32.50
47.64	1.19	0.00	47.50
47.68	1.23	0.00	57.50
47.72	1.22	0.00	55.00
47.76	1.18	0.00	45.00
47.80	1.15	0.00	37.50

Altran Report
96227-VR-01 Rev. 3
Att. Appx. E Sh. E43

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
47.84	1.12	0.00	30.00
47.88	1.10	0.00	25.00
47.92	1.10	0.00	25.00
47.96	1.09	0.00	22.50
48.00	1.08	0.00	20.00
48.04	1.07	0.00	17.50
48.08	1.06	0.00	15.00
48.12	1.06	0.00	15.00
48.16	1.05	0.00	12.50
48.20	1.05	0.00	12.50
48.24	1.04	0.00	10.00
48.28	1.04	0.00	10.00
48.32	1.04	0.00	10.00
48.36	1.04	0.00	10.00
48.40	1.04	0.00	10.00
48.44	1.05	0.00	12.50
48.48	1.04	0.00	10.00
48.52	1.04	0.00	10.00
48.56	1.06	0.00	15.00
48.60	1.19	0.00	47.50
48.64	1.61	0.00	152.50
48.68	1.82	0.00	205.00
48.72	1.72	0.00	180.00
48.76	1.55	0.00	137.50
48.80	1.41	0.00	102.50
48.84	1.32	0.00	80.00
48.88	1.24	0.00	60.00
48.92	1.20	0.00	50.00
48.96	1.18	0.00	45.00
49.00	1.18	0.00	45.00
49.04	1.19	0.00	47.50
49.08	1.23	0.00	57.50
49.12	1.23	0.00	57.50
49.16	1.20	0.00	50.00
49.20	1.18	0.00	45.00
49.24	1.17	0.00	42.50
49.28	1.26	0.00	65.00
49.32	1.43	0.00	107.50
49.36	1.56	0.00	140.00
49.40	1.61	0.00	152.50
49.44	1.55	0.00	137.50
49.48	1.47	0.00	117.50
49.52	1.39	0.00	97.50
49.56	1.32	0.00	80.00
49.60	1.27	0.00	67.50
49.64	1.26	0.00	65.00
49.68	1.28	0.00	70.00
49.72	1.32	0.00	80.00
49.76	1.35	0.00	87.50
49.80	1.38	0.00	95.00
49.84	1.43	0.00	107.50
49.88	1.48	0.00	120.00

Altran Report
91227-TR-01 Rev. 3
Att/Appx. E Sh. E44

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 26 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
49.92	1.50	0.00	125.00
49.96	1.53	0.00	132.50
50.00	1.54	0.00	135.00
50.04	1.50	0.00	125.00
50.08	1.44	0.00	110.00
50.12	1.41	0.00	102.50
50.16	1.39	0.00	97.50
50.20	1.35	0.00	87.50
50.24	1.35	0.00	87.50
50.28	1.40	0.00	100.00
50.32	1.42	0.00	105.00
50.36	1.36	0.00	90.00
50.40	1.31	0.00	77.50
50.44	1.32	0.00	80.00
50.48	1.39	0.00	97.50
50.52	1.45	0.00	112.50
50.56	1.42	0.00	105.00
50.60	1.37	0.00	92.50
50.64	1.36	0.00	90.00
50.68	1.37	0.00	92.50
50.72	1.34	0.00	85.00
50.76	1.30	0.00	75.00
50.80	1.33	0.00	82.50
50.84	1.35	0.00	87.50
50.88	1.34	0.00	85.00
50.92	1.30	0.00	75.00
50.96	1.30	0.00	75.00
51.00	1.35	0.00	87.50
51.04	1.41	0.00	102.50
51.08	1.40	0.00	100.00
51.12	1.35	0.00	87.50
51.16	1.32	0.00	80.00
51.20	1.32	0.00	80.00
51.24	1.32	0.00	80.00
51.28	1.30	0.00	75.00
51.32	1.28	0.00	70.00
51.36	1.29	0.00	72.50
51.40	1.32	0.00	80.00
51.44	1.31	0.00	77.50
51.48	1.28	0.00	70.00
51.52	1.28	0.00	70.00
51.56	1.31	0.00	77.50
51.60	1.32	0.00	80.00
51.64	1.30	0.00	75.00
51.68	1.28	0.00	70.00
51.72	1.27	0.00	67.50
51.76	1.28	0.00	70.00
51.80	1.28	0.00	70.00
51.84	1.29	0.00	72.50
51.88	1.29	0.00	72.50
51.92	1.30	0.00	75.00
51.96	1.30	0.00	75.00

Altran Report
96237-TR-01 Rev. 3
Att./Appx. E Sh. E45

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
52.00	1.28	0.00	70.00
52.04	1.26	0.00	65.00
52.08	1.26	0.00	65.00
52.12	1.28	0.00	70.00
52.16	1.28	0.00	70.00
52.20	1.28	0.00	70.00
52.24	1.27	0.00	67.50
52.28	1.25	0.00	62.50
52.32	1.24	0.00	60.00
52.36	1.25	0.00	62.50
52.40	1.28	0.00	70.00
52.44	1.29	0.00	72.50
52.48	1.27	0.00	67.50
52.52	1.24	0.00	60.00
52.56	1.24	0.00	60.00
52.60	1.25	0.00	62.50
52.64	1.25	0.00	62.50
52.68	1.24	0.00	60.00
52.72	1.24	0.00	60.00
52.76	1.25	0.00	62.50
52.80	1.25	0.00	62.50
52.84	1.25	0.00	62.50
52.88	1.25	0.00	62.50
52.92	1.26	0.00	65.00
52.96	1.27	0.00	67.50
53.00	1.27	0.00	67.50
53.04	1.26	0.00	65.00
53.08	1.24	0.00	60.00
53.12	1.25	0.00	62.50
53.16	1.25	0.00	62.50
53.20	1.25	0.00	62.50
53.24	1.25	0.00	62.50
53.28	1.25	0.00	62.50
53.32	1.25	0.00	62.50
53.36	1.24	0.00	60.00
53.40	1.23	0.00	57.50
53.44	1.24	0.00	60.00
53.48	1.25	0.00	62.50
53.52	1.26	0.00	65.00
53.56	1.26	0.00	65.00
53.60	1.25	0.00	62.50
53.64	1.25	0.00	62.50
53.68	1.25	0.00	62.50
53.72	1.26	0.00	65.00
53.76	1.25	0.00	62.50
53.80	1.25	0.00	62.50
53.84	1.25	0.00	62.50
53.88	1.25	0.00	62.50
53.92	1.25	0.00	62.50
53.96	1.25	0.00	62.50
54.00	1.25	0.00	62.50
54.04	1.25	0.00	62.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E/16

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
54.08	1.25	0.00	62.50
54.12	1.25	0.00	62.50
54.16	1.25	0.00	62.50
54.20	1.25	0.00	62.50
54.24	1.24	0.00	60.00
54.28	1.24	0.00	60.00
54.32	1.25	0.00	62.50
54.36	1.26	0.00	65.00
54.40	1.24	0.00	60.00
54.44	1.23	0.00	57.50
54.48	1.24	0.00	60.00
54.52	1.25	0.00	62.50
54.56	1.25	0.00	62.50
54.60	1.25	0.00	62.50
54.64	1.25	0.00	62.50
54.68	1.26	0.00	65.00
54.72	1.26	0.00	65.00
54.76	1.26	0.00	65.00
54.80	1.27	0.00	67.50
54.84	1.27	0.00	67.50
54.88	1.27	0.00	67.50
54.92	1.26	0.00	65.00
54.96	1.25	0.00	62.50
55.00	1.25	0.00	62.50
55.04	1.25	0.00	62.50
55.08	1.26	0.00	65.00
55.12	1.26	0.00	65.00
55.16	1.25	0.00	62.50
55.20	1.25	0.00	62.50
55.24	1.26	0.00	65.00
55.28	1.25	0.00	62.50
55.32	1.25	0.00	62.50
55.36	1.24	0.00	60.00
55.40	1.25	0.00	62.50
55.44	1.25	0.00	62.50
55.48	1.24	0.00	60.00
55.52	1.24	0.00	60.00
55.56	1.25	0.00	62.50
55.60	1.27	0.00	67.50
55.64	1.27	0.00	67.50
55.68	1.26	0.00	65.00
55.72	1.26	0.00	65.00
55.76	1.26	0.00	65.00
55.80	1.26	0.00	65.00
55.84	1.26	0.00	65.00
55.88	1.26	0.00	65.00
55.92	1.27	0.00	67.50
55.96	1.27	0.00	67.50
56.00	1.28	0.00	70.00
56.04	1.28	0.00	70.00
56.08	1.28	0.00	70.00
56.12	1.27	0.00	67.50

Altran Report
96227-TR-01 Rev. 3
Att/Apx. E Sh. E47

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 29 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
56.16	1.26	0.00	65.00
56.20	1.26	0.00	65.00
56.24	1.27	0.00	67.50
56.28	1.27	0.00	67.50
56.32	1.26	0.00	65.00
56.36	1.26	0.00	65.00
56.40	1.27	0.00	67.50
56.44	1.29	0.00	72.50
56.48	1.28	0.00	70.00
56.52	1.28	0.00	70.00
56.56	1.28	0.00	70.00
56.60	1.28	0.00	70.00
56.64	1.28	0.00	70.00
56.68	1.28	0.00	70.00
56.72	1.28	0.00	70.00
56.76	1.28	0.00	70.00
56.80	1.27	0.00	67.50
56.84	1.26	0.00	65.00
56.88	1.26	0.00	65.00
56.92	1.27	0.00	67.50
56.96	1.27	0.00	67.50
57.00	1.27	0.00	67.50
57.04	1.26	0.00	65.00
57.08	1.27	0.00	67.50
57.12	1.28	0.00	70.00
57.16	1.28	0.00	70.00
57.20	1.27	0.00	67.50
57.24	1.27	0.00	67.50
57.28	1.27	0.00	67.50
57.32	1.28	0.00	70.00
57.36	1.27	0.00	67.50
57.40	1.27	0.00	67.50
57.44	1.26	0.00	65.00
57.48	1.27	0.00	67.50
57.52	1.28	0.00	70.00
57.56	1.28	0.00	70.00
57.60	1.28	0.00	70.00
57.64	1.27	0.00	67.50
57.68	1.27	0.00	67.50
57.72	1.27	0.00	67.50
57.76	1.27	0.00	67.50
57.80	1.28	0.00	70.00
57.84	1.28	0.00	70.00
57.88	1.28	0.00	70.00
57.92	1.28	0.00	70.00
57.96	1.28	0.00	70.00
58.00	1.28	0.00	70.00
58.04	1.29	0.00	72.50
58.08	1.29	0.00	72.50
58.12	1.28	0.00	70.00
58.16	1.28	0.00	70.00
58.20	1.28	0.00	70.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E48

Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 30 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
58.24	1.28	0.00	70.00
58.28	1.28	0.00	70.00
58.32	1.28	0.00	70.00
58.36	1.28	0.00	70.00
58.40	1.28	0.00	70.00
58.44	1.28	0.00	70.00
58.48	1.28	0.00	70.00
58.52	1.28	0.00	70.00
58.56	1.27	0.00	67.50
58.60	1.27	0.00	67.50
58.64	1.28	0.00	70.00
58.68	1.28	0.00	70.00
58.72	1.27	0.00	67.50
58.76	1.27	0.00	67.50
58.80	1.27	0.00	67.50
58.84	1.27	0.00	67.50
58.88	1.29	0.00	72.50
58.92	1.30	0.00	75.00
58.96	1.29	0.00	72.50
59.00	1.28	0.00	70.00
59.04	1.29	0.00	72.50
59.08	1.28	0.00	70.00
59.12	1.28	0.00	70.00
59.16	1.27	0.00	67.50
59.20	1.27	0.00	67.50
59.24	1.27	0.00	67.50
59.28	1.27	0.00	67.50
59.32	1.27	0.00	67.50
59.36	1.27	0.00	67.50
59.40	1.27	0.00	67.50
59.44	1.27	0.00	67.50
59.48	1.27	0.00	67.50
59.52	1.28	0.00	70.00
59.56	1.28	0.00	70.00
59.60	1.28	0.00	70.00
59.64	1.29	0.00	72.50
59.68	1.30	0.00	75.00
59.72	1.30	0.00	75.00
59.76	1.30	0.00	75.00
59.80	1.30	0.00	75.00
59.84	1.29	0.00	72.50
59.88	1.29	0.00	72.50
59.92	1.29	0.00	72.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E49

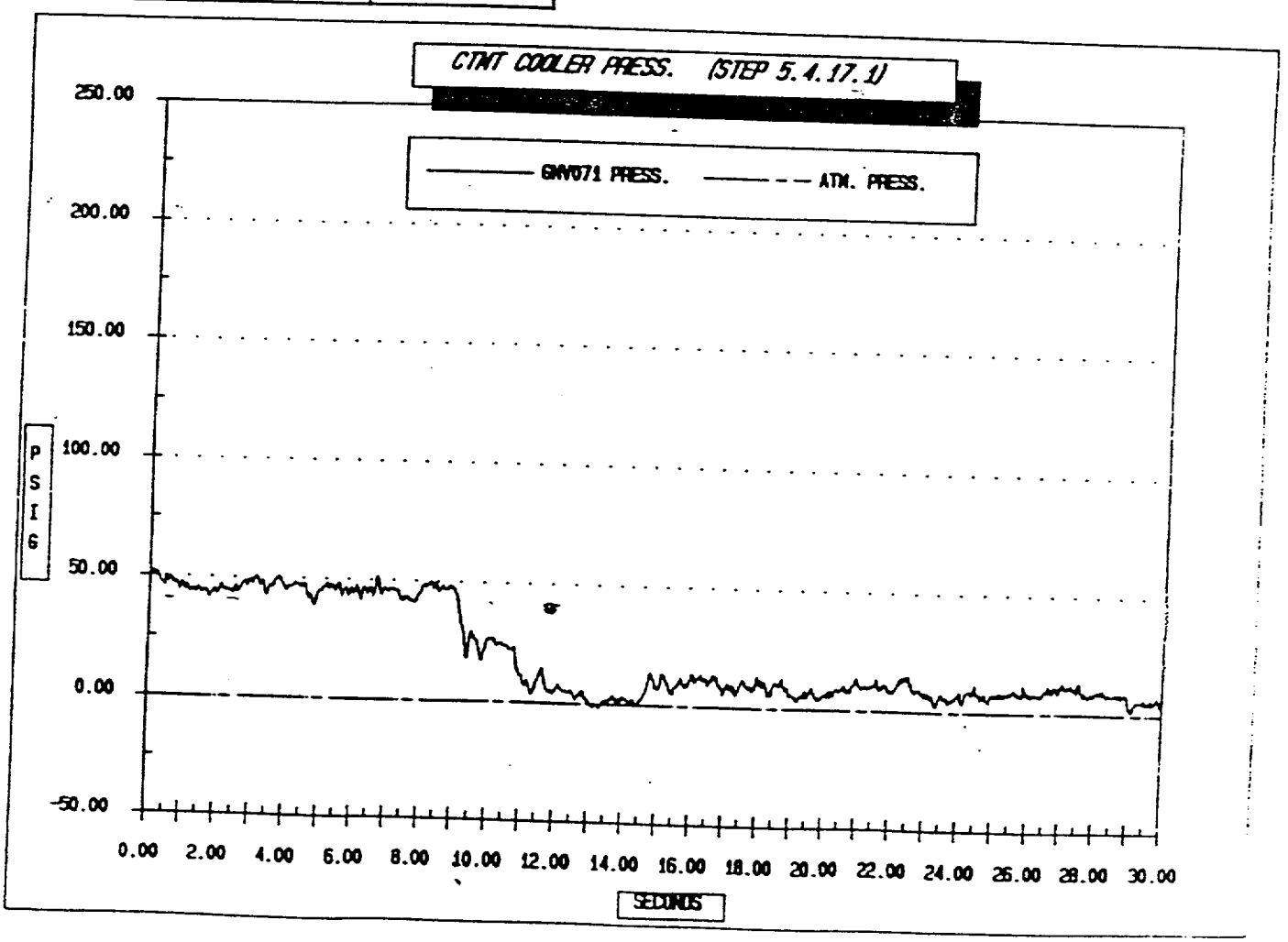
Attachment 1 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 31 of 31

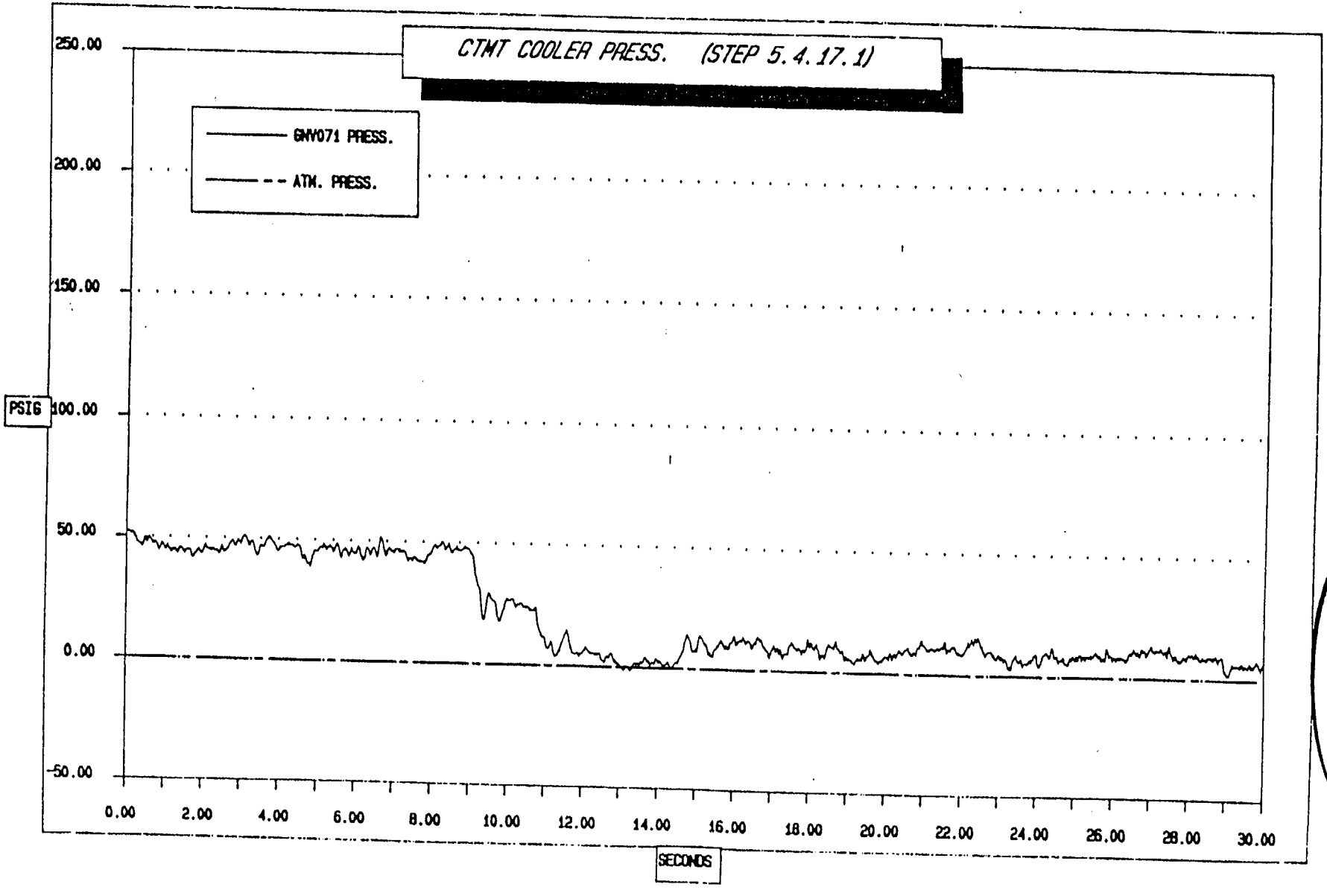
Data collected during step 5.4.17.1 ESW pump load reject. Data shows ESW pump shutdown by placing the handswitch in PTL. Service water is cross connected to maintain system fill and pressure.

Test: STS KJ-001R STEP 5.4.17.1	
Run:	0.00
Device:	HB16
Channel:	1
Event:	1
First Sample:	36301.00
Last Sample:	37801.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	726.00
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.21
Y-Axis Min Value:	1.00
Y-Axis Units:	VOLTS

Altran Report
96237-TR-01 Rev. 3
Att./Appx. E Sh E50

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: [illegible] Date: 5/1/92
Verified By: TD Date: 5/7/92
Sheet 1 of 31





Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E51

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.21	0.00	52.00
0.02	1.21	0.00	52.00
0.04	1.21	0.00	51.25
0.06	1.21	0.00	52.00
0.08	1.21	0.00	52.00
0.10	1.21	0.00	51.25
0.12	1.21	0.00	51.25
0.14	1.20	0.00	50.75
0.16	1.21	0.00	51.25
0.18	1.21	0.00	51.25
0.20	1.20	0.00	50.75
0.22	1.20	0.00	50.00
0.24	1.20	0.00	49.50
0.26	1.19	0.00	48.25
0.28	1.19	0.00	47.50
0.30	1.19	0.00	47.50
0.32	1.19	0.00	47.00
0.34	1.19	0.00	47.00
0.36	1.19	0.00	46.50
0.38	1.19	0.00	46.50
0.40	1.18	0.00	45.75
0.42	1.19	0.00	47.00
0.44	1.19	0.00	48.25
0.46	1.20	0.00	49.50
0.48	1.20	0.00	49.50
0.50	1.19	0.00	48.25
0.52	1.19	0.00	47.50
0.54	1.19	0.00	48.25
0.56	1.20	0.00	49.50
0.58	1.20	0.00	49.50
0.60	1.20	0.00	49.50
0.62	1.20	0.00	48.75
0.64	1.19	0.00	48.25
0.66	1.19	0.00	47.00
0.68	1.19	0.00	47.50
0.70	1.19	0.00	47.50
0.72	1.19	0.00	47.00
0.74	1.19	0.00	47.50
0.76	1.19	0.00	47.50
0.78	1.19	0.00	47.00
0.80	1.19	0.00	46.50
0.82	1.18	0.00	45.25
0.84	1.18	0.00	44.50
0.86	1.18	0.00	44.50
0.88	1.18	0.00	45.75
0.90	1.19	0.00	46.50
0.92	1.19	0.00	47.50
0.94	1.19	0.00	47.00
0.96	1.19	0.00	47.00
0.98	1.18	0.00	45.75
1.00	1.18	0.00	45.25
1.02	1.18	0.00	44.50

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh. E52

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
1.04	1.18	0.00	45.25
1.06	1.18	0.00	45.75
1.08	1.19	0.00	46.50
1.10	1.18	0.00	45.75
1.12	1.18	0.00	44.50
1.14	1.18	0.00	44.00
1.16	1.17	0.00	43.25
1.18	1.18	0.00	44.50
1.20	1.18	0.00	44.00
1.22	1.18	0.00	44.50
1.24	1.18	0.00	45.25
1.26	1.18	0.00	45.25
1.28	1.18	0.00	44.50
1.30	1.18	0.00	44.00
1.32	1.17	0.00	43.25
1.34	1.17	0.00	43.25
1.36	1.18	0.00	44.00
1.38	1.18	0.00	45.25
1.40	1.18	0.00	45.75
1.42	1.18	0.00	45.25
1.44	1.18	0.00	45.25
1.46	1.18	0.00	44.50
1.48	1.18	0.00	44.00
1.50	1.17	0.00	43.25
1.52	1.17	0.00	43.25
1.54	1.18	0.00	44.00
1.56	1.18	0.00	44.50
1.58	1.18	0.00	44.50
1.60	1.18	0.00	44.50
1.62	1.18	0.00	44.50
1.64	1.18	0.00	44.50
1.66	1.18	0.00	44.50
1.68	1.17	0.00	43.25
1.70	1.17	0.00	42.00
1.72	1.17	0.00	42.00
1.74	1.17	0.00	42.00
1.76	1.17	0.00	42.00
1.78	1.17	0.00	42.75
1.80	1.17	0.00	43.25
1.82	1.17	0.00	43.25
1.84	1.17	0.00	43.25
1.86	1.18	0.00	44.50
1.88	1.18	0.00	45.25
1.90	1.18	0.00	44.50
1.92	1.18	0.00	44.00
1.94	1.17	0.00	43.25
1.96	1.17	0.00	43.25
1.98	1.17	0.00	43.25
2.00	1.18	0.00	44.00
2.02	1.18	0.00	44.50
2.04	1.18	0.00	45.75
2.06	1.19	0.00	47.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E53

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.19	0.00	47.00
2.10	1.18	0.00	45.75
2.12	1.18	0.00	45.25
2.14	1.18	0.00	45.25
2.16	1.18	0.00	45.25
2.18	1.18	0.00	45.25
2.20	1.18	0.00	44.50
2.22	1.18	0.00	44.50
2.24	1.18	0.00	45.25
2.26	1.18	0.00	45.25
2.28	1.18	0.00	45.25
2.30	1.18	0.00	44.50
2.32	1.18	0.00	44.50
2.34	1.18	0.00	44.50
2.36	1.18	0.00	44.50
2.38	1.18	0.00	44.00
2.40	1.17	0.00	43.25
2.42	1.17	0.00	43.25
2.44	1.18	0.00	44.00
2.46	1.18	0.00	45.25
2.48	1.19	0.00	46.50
2.50	1.19	0.00	46.50
2.52	1.18	0.00	45.75
2.54	1.18	0.00	44.50
2.56	1.18	0.00	44.00
2.58	1.18	0.00	44.50
2.60	1.18	0.00	45.25
2.62	1.18	0.00	45.25
2.64	1.18	0.00	45.75
2.66	1.18	0.00	45.75
2.68	1.19	0.00	47.00
2.70	1.19	0.00	47.50
2.72	1.19	0.00	47.50
2.74	1.19	0.00	48.25
2.76	1.20	0.00	48.75
2.78	1.20	0.00	48.75
2.80	1.20	0.00	48.75
2.82	1.19	0.00	47.00
2.84	1.19	0.00	46.50
2.86	1.19	0.00	47.00
2.88	1.19	0.00	48.25
2.90	1.19	0.00	48.25
2.92	1.20	0.00	49.50
2.94	1.20	0.00	48.75
2.96	1.19	0.00	48.25
2.98	1.19	0.00	48.25
3.00	1.19	0.00	47.50
3.02	1.19	0.00	48.25
3.04	1.20	0.00	49.50
3.06	1.20	0.00	50.75
3.08	1.20	0.00	50.75
3.10	1.20	0.00	50.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh ES4

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
3.12	1.20	0.00	50.75
3.14	1.20	0.00	50.00
3.16	1.20	0.00	48.75
3.18	1.20	0.00	48.75
3.20	1.19	0.00	47.00
3.22	1.19	0.00	47.00
3.24	1.19	0.00	47.50
3.26	1.20	0.00	48.75
3.28	1.20	0.00	48.75
3.30	1.20	0.00	48.75
3.32	1.19	0.00	48.25
3.34	1.18	0.00	45.75
3.36	1.18	0.00	44.50
3.38	1.17	0.00	43.25
3.40	1.17	0.00	43.25
3.42	1.17	0.00	42.75
3.44	1.17	0.00	43.25
3.46	1.18	0.00	44.00
3.48	1.18	0.00	45.75
3.50	1.19	0.00	47.00
3.52	1.19	0.00	47.00
3.54	1.19	0.00	47.00
3.56	1.19	0.00	46.50
3.58	1.19	0.00	46.50
3.60	1.19	0.00	47.00
3.62	1.19	0.00	47.50
3.64	1.20	0.00	48.75
3.66	1.20	0.00	49.50
3.68	1.20	0.00	49.50
3.70	1.20	0.00	50.00
3.72	1.20	0.00	50.75
3.74	1.20	0.00	50.75
3.76	1.20	0.00	50.75
3.78	1.20	0.00	50.00
3.80	1.20	0.00	50.00
3.82	1.20	0.00	48.75
3.84	1.19	0.00	48.25
3.86	1.19	0.00	48.25
3.88	1.19	0.00	47.50
3.90	1.19	0.00	47.00
3.92	1.19	0.00	46.50
3.94	1.18	0.00	45.25
3.96	1.18	0.00	45.25
3.98	1.18	0.00	45.25
4.00	1.18	0.00	45.25
4.02	1.18	0.00	45.75
4.04	1.19	0.00	46.50
4.06	1.19	0.00	46.50
4.08	1.19	0.00	46.50
4.10	1.19	0.00	46.50
4.12	1.19	0.00	46.50
4.14	1.19	0.00	47.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E55

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.19	0.00	47.00
4.18	1.19	0.00	47.50
4.20	1.19	0.00	47.50
4.22	1.19	0.00	47.50
4.24	1.19	0.00	48.25
4.26	1.19	0.00	47.50
4.28	1.19	0.00	47.50
4.30	1.19	0.00	47.50
4.32	1.19	0.00	47.50
4.34	1.19	0.00	47.50
4.36	1.19	0.00	47.00
4.38	1.19	0.00	46.50
4.40	1.19	0.00	46.50
4.42	1.19	0.00	46.50
4.44	1.19	0.00	47.00
4.46	1.19	0.00	47.50
4.48	1.19	0.00	47.50
4.50	1.19	0.00	47.50
4.52	1.19	0.00	47.00
4.54	1.19	0.00	46.50
4.56	1.18	0.00	45.25
4.58	1.17	0.00	43.25
4.60	1.17	0.00	42.00
4.62	1.17	0.00	42.00
4.64	1.17	0.00	42.00
4.66	1.17	0.00	43.25
4.68	1.17	0.00	42.75
4.70	1.17	0.00	42.00
4.72	1.16	0.00	41.00
4.74	1.16	0.00	39.75
4.76	1.16	0.00	39.75
4.78	1.16	0.00	39.75
4.80	1.16	0.00	39.00
4.82	1.16	0.00	39.75
4.84	1.16	0.00	41.00
4.86	1.17	0.00	42.75
4.88	1.17	0.00	43.25
4.90	1.18	0.00	44.00
4.92	1.18	0.00	45.25
4.94	1.18	0.00	45.25
4.96	1.18	0.00	45.25
4.98	1.18	0.00	45.25
5.00	1.18	0.00	45.25
5.02	1.18	0.00	45.25
5.04	1.19	0.00	46.50
5.06	1.19	0.00	46.50
5.08	1.19	0.00	47.00
5.10	1.19	0.00	47.00
5.12	1.19	0.00	46.50
5.14	1.19	0.00	47.00
5.16	1.19	0.00	48.25
5.18	1.19	0.00	47.50

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh. E56

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
5.20	1.19	0.00	47.50
5.22	1.19	0.00	46.50
5.24	1.18	0.00	45.75
5.26	1.19	0.00	46.50
5.28	1.19	0.00	47.00
5.30	1.19	0.00	47.50
5.32	1.19	0.00	47.50
5.34	1.19	0.00	47.00
5.36	1.19	0.00	47.00
5.38	1.19	0.00	46.50
5.40	1.18	0.00	45.25
5.42	1.18	0.00	45.25
5.44	1.18	0.00	45.75
5.46	1.19	0.00	46.50
5.48	1.19	0.00	47.50
5.50	1.19	0.00	48.25
5.52	1.19	0.00	48.25
5.54	1.19	0.00	47.50
5.56	1.19	0.00	46.50
5.58	1.18	0.00	44.50
5.60	1.17	0.00	43.25
5.62	1.17	0.00	42.75
5.64	1.17	0.00	43.25
5.66	1.18	0.00	45.25
5.68	1.18	0.00	45.75
5.70	1.18	0.00	45.75
5.72	1.18	0.00	45.75
5.74	1.19	0.00	46.50
5.76	1.18	0.00	45.75
5.78	1.18	0.00	45.25
5.80	1.18	0.00	44.00
5.82	1.17	0.00	43.25
5.84	1.18	0.00	44.00
5.86	1.18	0.00	44.50
5.88	1.18	0.00	45.75
5.90	1.19	0.00	46.50
5.92	1.18	0.00	45.75
5.94	1.18	0.00	45.25
5.96	1.18	0.00	44.50
5.98	1.18	0.00	44.50
6.00	1.18	0.00	44.50
6.02	1.18	0.00	45.25
6.04	1.19	0.00	46.50
6.06	1.19	0.00	47.50
6.08	1.19	0.00	47.00
6.10	1.19	0.00	46.50
6.12	1.18	0.00	44.50
6.14	1.17	0.00	43.25
6.16	1.17	0.00	43.25
6.18	1.17	0.00	42.00
6.20	1.17	0.00	42.00
6.22	1.17	0.00	42.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E57

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 8 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.18	0.00	44.50
6.26	1.19	0.00	46.50
6.28	1.19	0.00	47.00
6.30	1.19	0.00	46.50
6.32	1.19	0.00	46.50
6.34	1.18	0.00	45.75
6.36	1.18	0.00	45.25
6.38	1.18	0.00	44.00
6.40	1.18	0.00	44.50
6.42	1.18	0.00	45.25
6.44	1.19	0.00	46.50
6.46	1.19	0.00	47.00
6.48	1.19	0.00	47.00
6.50	1.19	0.00	46.50
6.52	1.18	0.00	45.25
6.54	1.18	0.00	44.50
6.56	1.17	0.00	43.25
6.58	1.18	0.00	44.00
6.60	1.18	0.00	45.75
6.62	1.19	0.00	47.50
6.64	1.20	0.00	49.50
6.66	1.21	0.00	51.25
6.68	1.21	0.00	51.25
6.70	1.20	0.00	50.00
6.72	1.20	0.00	48.75
6.74	1.19	0.00	47.00
6.76	1.18	0.00	45.75
6.78	1.18	0.00	44.50
6.80	1.18	0.00	44.00
6.82	1.18	0.00	44.50
6.84	1.18	0.00	45.75
6.86	1.19	0.00	46.50
6.88	1.19	0.00	47.00
6.90	1.19	0.00	47.00
6.92	1.19	0.00	46.50
6.94	1.18	0.00	45.75
6.96	1.18	0.00	45.75
6.98	1.18	0.00	45.75
7.00	1.18	0.00	45.25
7.02	1.18	0.00	45.75
7.04	1.19	0.00	46.50
7.06	1.19	0.00	46.50
7.08	1.19	0.00	46.50
7.10	1.19	0.00	46.50
7.12	1.19	0.00	46.50
7.14	1.18	0.00	45.75
7.16	1.19	0.00	46.50
7.18	1.18	0.00	45.75
7.20	1.18	0.00	45.75
7.22	1.18	0.00	45.75
7.24	1.18	0.00	45.75
7.26	1.18	0.00	45.75

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh E58

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 9 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
7.28	1.18	0.00	45.75
7.30	1.18	0.00	45.25
7.32	1.18	0.00	44.50
7.34	1.17	0.00	43.25
7.36	1.17	0.00	42.75
7.38	1.17	0.00	42.00
7.40	1.17	0.00	42.75
7.42	1.17	0.00	42.75
7.44	1.17	0.00	42.75
7.46	1.17	0.00	42.75
7.48	1.17	0.00	42.00
7.50	1.17	0.00	42.75
7.52	1.17	0.00	43.25
7.54	1.17	0.00	43.25
7.56	1.17	0.00	43.25
7.58	1.17	0.00	42.75
7.60	1.17	0.00	42.75
7.62	1.17	0.00	42.00
7.64	1.17	0.00	42.00
7.66	1.17	0.00	42.00
7.68	1.17	0.00	42.00
7.70	1.17	0.00	41.50
7.72	1.17	0.00	41.50
7.74	1.17	0.00	41.50
7.76	1.17	0.00	41.50
7.78	1.17	0.00	41.50
7.80	1.16	0.00	41.00
7.82	1.17	0.00	41.50
7.84	1.17	0.00	42.00
7.86	1.17	0.00	42.75
7.88	1.18	0.00	44.00
7.90	1.18	0.00	44.50
7.92	1.18	0.00	44.50
7.94	1.18	0.00	45.25
7.96	1.18	0.00	45.25
7.98	1.18	0.00	45.75
8.00	1.19	0.00	47.00
8.02	1.19	0.00	47.50
8.04	1.19	0.00	48.25
8.06	1.20	0.00	48.75
8.08	1.20	0.00	48.75
8.10	1.19	0.00	48.25
8.12	1.19	0.00	47.50
8.14	1.19	0.00	47.50
8.16	1.19	0.00	48.25
8.18	1.20	0.00	48.75
8.20	1.20	0.00	48.75
8.22	1.20	0.00	48.75
8.24	1.20	0.00	49.50
8.26	1.20	0.00	50.00
8.28	1.20	0.00	50.00
8.30	1.20	0.00	49.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E59

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.19	0.00	48.25
8.34	1.19	0.00	47.00
8.36	1.19	0.00	47.00
8.38	1.19	0.00	47.50
8.40	1.19	0.00	48.25
8.42	1.20	0.00	49.50
8.44	1.20	0.00	48.75
8.46	1.19	0.00	47.50
8.48	1.19	0.00	46.50
8.50	1.18	0.00	45.75
8.52	1.18	0.00	45.75
8.54	1.18	0.00	45.75
8.56	1.19	0.00	46.50
8.58	1.19	0.00	47.00
8.60	1.19	0.00	47.00
8.62	1.19	0.00	47.50
8.64	1.19	0.00	48.25
8.66	1.19	0.00	47.00
8.68	1.19	0.00	47.00
8.70	1.19	0.00	46.50
8.72	1.19	0.00	46.50
8.74	1.19	0.00	46.50
8.76	1.19	0.00	46.50
8.78	1.19	0.00	47.00
8.80	1.19	0.00	47.00
8.82	1.19	0.00	47.50
8.84	1.19	0.00	47.50
8.86	1.19	0.00	48.25
8.88	1.19	0.00	47.50
8.90	1.19	0.00	47.50
8.92	1.19	0.00	47.50
8.94	1.19	0.00	47.50
8.96	1.19	0.00	47.00
8.98	1.19	0.00	46.50
9.00	1.18	0.00	45.75
9.02	1.18	0.00	45.25
9.04	1.18	0.00	45.25
9.06	1.18	0.00	44.50
9.08	1.18	0.00	44.00
9.10	1.17	0.00	42.00
9.12	1.16	0.00	39.75
9.14	1.15	0.00	37.25
9.16	1.14	0.00	34.75
9.18	1.13	0.00	33.50
9.20	1.13	0.00	32.25
9.22	1.13	0.00	31.75
9.24	1.13	0.00	31.25
9.26	1.12	0.00	30.50
9.28	1.11	0.00	28.00
9.30	1.10	0.00	24.50
9.32	1.09	0.00	22.00
9.34	1.08	0.00	19.50

Altran Report
91627-TR-01 Rev. 3
Att./Appx. E Sh E60

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
9.36	1.07	0.00	18.25
9.38	1.07	0.00	18.25
9.40	1.08	0.00	20.75
9.42	1.09	0.00	22.50
9.44	1.10	0.00	25.00
9.46	1.11	0.00	27.50
9.48	1.12	0.00	29.25
9.50	1.12	0.00	29.25
9.52	1.12	0.00	28.75
9.54	1.11	0.00	28.00
9.56	1.11	0.00	26.75
9.58	1.11	0.00	26.75
9.60	1.11	0.00	26.25
9.62	1.10	0.00	25.75
9.64	1.10	0.00	25.75
9.66	1.10	0.00	25.75
9.68	1.10	0.00	25.00
9.70	1.09	0.00	23.25
9.72	1.09	0.00	21.25
9.74	1.08	0.00	19.50
9.76	1.08	0.00	19.00
9.78	1.07	0.00	17.75
9.80	1.07	0.00	17.75
9.82	1.07	0.00	17.75
9.84	1.08	0.00	19.00
9.86	1.08	0.00	20.75
9.88	1.09	0.00	22.00
9.90	1.09	0.00	22.50
9.92	1.10	0.00	23.75
9.94	1.10	0.00	25.00
9.96	1.11	0.00	26.25
9.98	1.11	0.00	26.75
10.00	1.11	0.00	26.75
10.02	1.11	0.00	26.25
10.04	1.11	0.00	26.25
10.06	1.11	0.00	26.25
10.08	1.11	0.00	26.25
10.10	1.11	0.00	26.75
10.12	1.11	0.00	26.75
10.14	1.11	0.00	26.75
10.16	1.11	0.00	26.25
10.18	1.10	0.00	25.00
10.20	1.10	0.00	24.50
10.22	1.10	0.00	23.75
10.24	1.10	0.00	23.75
10.26	1.10	0.00	24.50
10.28	1.10	0.00	24.50
10.30	1.10	0.00	24.50
10.32	1.10	0.00	24.50
10.34	1.10	0.00	25.00
10.36	1.10	0.00	25.00
10.38	1.10	0.00	25.00

Altran Report
96229-TR-01 Rev. 3
Att/Appx. E Sh E61

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	1.10	0.00	24.50
10.42	1.10	0.00	23.75
10.44	1.10	0.00	23.75
10.46	1.10	0.00	23.75
10.48	1.10	0.00	23.75
10.50	1.10	0.00	23.75
10.52	1.10	0.00	23.75
10.54	1.10	0.00	23.75
10.56	1.10	0.00	23.75
10.58	1.09	0.00	23.25
10.60	1.09	0.00	22.50
10.62	1.09	0.00	22.50
10.64	1.09	0.00	22.50
10.66	1.09	0.00	22.50
10.68	1.09	0.00	22.50
10.70	1.09	0.00	22.50
10.72	1.09	0.00	22.50
10.74	1.09	0.00	23.25
10.76	1.09	0.00	23.25
10.78	1.09	0.00	21.25
10.80	1.08	0.00	19.00
10.82	1.07	0.00	16.50
10.84	1.06	0.00	14.75
10.86	1.05	0.00	13.50
10.88	1.05	0.00	13.50
10.90	1.05	0.00	12.25
10.92	1.05	0.00	11.50
10.94	1.05	0.00	11.50
10.96	1.05	0.00	11.50
10.98	1.05	0.00	11.50
11.00	1.04	0.00	11.00
11.02	1.04	0.00	9.25
11.04	1.03	0.00	8.00
11.06	1.03	0.00	7.25
11.08	1.03	0.00	7.25
11.10	1.03	0.00	7.25
11.12	1.03	0.00	8.00
11.14	1.04	0.00	9.25
11.16	1.04	0.00	9.75
11.18	1.04	0.00	9.75
11.20	1.03	0.00	8.50
11.22	1.03	0.00	6.75
11.24	1.02	0.00	5.50
11.26	1.02	0.00	5.00
11.28	1.02	0.00	3.75
11.30	1.02	0.00	3.75
11.32	1.02	0.00	4.25
11.34	1.02	0.00	5.00
11.36	1.02	0.00	5.50
11.38	1.03	0.00	6.75
11.40	1.02	0.00	6.00
11.42	1.03	0.00	8.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E62

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
11.44	1.03	0.00	8.50
11.46	1.04	0.00	9.75
11.48	1.04	0.00	9.75
11.50	1.04	0.00	11.00
11.52	1.05	0.00	11.50
11.54	1.05	0.00	12.75
11.56	1.06	0.00	14.00
11.58	1.06	0.00	14.75
11.60	1.06	0.00	14.00
11.62	1.05	0.00	12.75
11.64	1.05	0.00	11.50
11.66	1.04	0.00	9.75
11.68	1.03	0.00	8.50
11.70	1.03	0.00	7.25
11.72	1.03	0.00	6.75
11.74	1.02	0.00	5.50
11.76	1.02	0.00	5.50
11.78	1.02	0.00	5.00
11.80	1.02	0.00	5.00
11.82	1.02	0.00	5.00
11.84	1.02	0.00	5.50
11.86	1.02	0.00	5.50
11.88	1.02	0.00	5.50
11.90	1.02	0.00	4.25
11.92	1.02	0.00	4.25
11.94	1.02	0.00	5.00
11.96	1.02	0.00	5.00
11.98	1.02	0.00	5.50
12.00	1.02	0.00	5.50
12.02	1.02	0.00	6.00
12.04	1.03	0.00	6.75
12.06	1.03	0.00	7.25
12.08	1.03	0.00	8.00
12.10	1.03	0.00	7.25
12.12	1.03	0.00	7.25
12.14	1.03	0.00	6.75
12.16	1.02	0.00	6.00
12.18	1.02	0.00	6.00
12.20	1.02	0.00	6.00
12.22	1.02	0.00	5.50
12.24	1.02	0.00	5.50
12.26	1.02	0.00	5.50
12.28	1.02	0.00	5.50
12.30	1.02	0.00	5.50
12.32	1.02	0.00	5.00
12.34	1.02	0.00	5.00
12.36	1.02	0.00	5.00
12.38	1.02	0.00	5.00
12.40	1.02	0.00	5.00
12.42	1.02	0.00	5.50
12.44	1.02	0.00	5.50
12.46	1.02	0.00	5.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E63

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 14 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	1.02	0.00	5.00
12.50	1.02	0.00	4.25
12.52	1.01	0.00	3.00
12.54	1.01	0.00	2.50
12.56	1.01	0.00	2.50
12.58	1.01	0.00	1.75
12.60	1.01	0.00	2.50
12.62	1.02	0.00	3.75
12.64	1.02	0.00	4.25
12.66	1.02	0.00	4.25
12.68	1.02	0.00	3.75
12.70	1.02	0.00	3.75
12.72	1.02	0.00	4.25
12.74	1.02	0.00	5.50
12.76	1.02	0.00	5.50
12.78	1.02	0.00	5.50
12.80	1.02	0.00	4.25
12.82	1.01	0.00	3.00
12.84	1.01	0.00	2.50
12.86	1.01	0.00	1.75
12.88	1.01	0.00	3.00
12.90	1.01	0.00	1.75
12.92	1.01	0.00	1.25
12.94	1.01	0.00	1.75
12.96	1.01	0.00	1.25
12.98	1.01	0.00	1.25
13.00	1.00	0.00	0.50
13.02	1.00	0.00	0.00
13.04	1.00	0.00	-0.60
13.06	1.00	0.00	0.00
13.08	1.00	0.00	-0.60
13.10	1.00	0.00	-1.23
13.12	1.00	0.00	-0.60
13.14	1.00	0.00	0.00
13.16	1.00	0.00	0.50
13.18	1.00	0.00	0.00
13.20	1.00	0.00	0.00
13.22	1.00	0.00	0.00
13.24	1.00	0.00	0.00
13.26	1.00	0.00	-1.23
13.28	1.00	0.00	-1.23
13.30	1.00	0.00	-0.60
13.32	1.00	0.00	-0.60
13.34	1.00	0.00	0.50
13.36	1.01	0.00	1.25
13.38	1.01	0.00	1.75
13.40	1.01	0.00	1.75
13.42	1.01	0.00	1.75
13.44	1.01	0.00	1.25
13.46	1.01	0.00	1.75
13.48	1.01	0.00	1.75
13.50	1.01	0.00	1.25

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh. E64

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
13.52	1.01	0.00	1.75
13.54	1.01	0.00	2.50
13.56	1.01	0.00	1.75
13.58	1.01	0.00	1.75
13.60	1.01	0.00	2.50
13.62	1.01	0.00	2.50
13.64	1.02	0.00	3.75
13.66	1.02	0.00	4.25
13.68	1.02	0.00	4.25
13.70	1.02	0.00	3.75
13.72	1.01	0.00	2.50
13.74	1.01	0.00	3.00
13.76	1.01	0.00	2.50
13.78	1.01	0.00	1.25
13.80	1.01	0.00	1.25
13.82	1.01	0.00	1.75
13.84	1.01	0.00	2.50
13.86	1.01	0.00	2.50
13.88	1.01	0.00	1.75
13.90	1.01	0.00	1.75
13.92	1.01	0.00	1.75
13.94	1.02	0.00	3.75
13.96	1.02	0.00	3.75
13.98	1.01	0.00	3.00
14.00	1.01	0.00	2.50
14.02	1.01	0.00	2.50
14.04	1.01	0.00	3.00
14.06	1.01	0.00	3.00
14.08	1.01	0.00	2.50
14.10	1.01	0.00	1.75
14.12	1.01	0.00	1.25
14.14	1.00	0.00	0.50
14.16	1.01	0.00	1.25
14.18	1.01	0.00	1.25
14.20	1.01	0.00	1.25
14.22	1.01	0.00	1.75
14.24	1.01	0.00	2.50
14.26	1.01	0.00	2.50
14.28	1.01	0.00	2.50
14.30	1.01	0.00	1.25
14.32	1.00	0.00	0.50
14.34	1.00	0.00	0.00
14.36	1.00	0.00	0.00
14.38	1.00	0.00	0.50
14.40	1.00	0.00	0.50
14.42	1.01	0.00	1.25
14.44	1.01	0.00	1.75
14.46	1.01	0.00	2.50
14.48	1.01	0.00	2.50
14.50	1.01	0.00	2.50
14.52	1.01	0.00	2.50
14.54	1.02	0.00	3.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E65

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 16 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	1.02	0.00	4.25
14.58	1.02	0.00	5.00
14.60	1.02	0.00	5.50
14.62	1.02	0.00	6.00
14.64	1.03	0.00	6.75
14.66	1.03	0.00	7.25
14.68	1.03	0.00	8.50
14.70	1.04	0.00	10.50
14.72	1.05	0.00	12.25
14.74	1.05	0.00	13.50
14.76	1.06	0.00	14.00
14.78	1.05	0.00	13.50
14.80	1.05	0.00	12.75
14.82	1.05	0.00	12.25
14.84	1.05	0.00	11.50
14.86	1.04	0.00	11.00
14.88	1.04	0.00	9.25
14.90	1.03	0.00	8.00
14.92	1.03	0.00	7.25
14.94	1.03	0.00	7.25
14.96	1.03	0.00	7.25
14.98	1.03	0.00	8.00
15.00	1.03	0.00	7.25
15.02	1.03	0.00	7.25
15.04	1.03	0.00	8.50
15.06	1.04	0.00	11.00
15.08	1.05	0.00	12.75
15.10	1.05	0.00	13.50
15.12	1.05	0.00	13.50
15.14	1.05	0.00	12.75
15.16	1.05	0.00	12.75
15.18	1.05	0.00	12.75
15.20	1.04	0.00	11.00
15.22	1.04	0.00	10.50
15.24	1.04	0.00	9.75
15.26	1.04	0.00	10.50
15.28	1.04	0.00	9.75
15.30	1.03	0.00	8.50
15.32	1.03	0.00	7.25
15.34	1.02	0.00	6.00
15.36	1.03	0.00	6.75
15.38	1.03	0.00	6.75
15.40	1.02	0.00	5.50
15.42	1.02	0.00	5.50
15.44	1.02	0.00	5.50
15.46	1.03	0.00	7.25
15.48	1.03	0.00	8.00
15.50	1.03	0.00	8.00
15.52	1.03	0.00	8.50
15.54	1.03	0.00	8.50
15.56	1.04	0.00	9.75
15.58	1.04	0.00	9.25

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E66

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
15.60	1.04	0.00	9.75
15.62	1.04	0.00	11.00
15.64	1.04	0.00	11.00
15.66	1.05	0.00	12.25
15.68	1.05	0.00	11.50
15.70	1.04	0.00	10.50
15.72	1.04	0.00	9.75
15.74	1.04	0.00	9.75
15.76	1.03	0.00	8.50
15.78	1.04	0.00	9.25
15.80	1.04	0.00	9.75
15.82	1.04	0.00	9.25
15.84	1.03	0.00	8.50
15.86	1.03	0.00	8.50
15.88	1.04	0.00	9.25
15.90	1.04	0.00	11.00
15.92	1.04	0.00	11.00
15.94	1.05	0.00	11.50
15.96	1.05	0.00	11.50
15.98	1.05	0.00	13.50
16.00	1.06	0.00	14.00
16.02	1.05	0.00	13.50
16.04	1.05	0.00	12.25
16.06	1.04	0.00	10.50
16.08	1.04	0.00	10.50
16.10	1.05	0.00	11.50
16.12	1.04	0.00	11.00
16.14	1.05	0.00	12.25
16.16	1.05	0.00	12.25
16.18	1.05	0.00	12.25
16.20	1.05	0.00	12.25
16.22	1.05	0.00	12.25
16.24	1.05	0.00	13.50
16.26	1.05	0.00	12.75
16.28	1.05	0.00	12.75
16.30	1.05	0.00	11.50
16.32	1.04	0.00	11.00
16.34	1.05	0.00	11.50
16.36	1.05	0.00	11.50
16.38	1.05	0.00	12.25
16.40	1.05	0.00	12.25
16.42	1.05	0.00	11.50
16.44	1.04	0.00	10.50
16.46	1.04	0.00	9.25
16.48	1.04	0.00	9.25
16.50	1.04	0.00	9.75
16.52	1.04	0.00	11.00
16.54	1.05	0.00	11.50
16.56	1.05	0.00	11.50
16.58	1.04	0.00	11.00
16.60	1.05	0.00	12.75
16.62	1.05	0.00	13.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E67

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	1.05	0.00	13.50
16.66	1.05	0.00	12.75
16.68	1.05	0.00	12.25
16.70	1.05	0.00	12.25
16.72	1.05	0.00	12.75
16.74	1.05	0.00	11.50
16.76	1.04	0.00	11.00
16.78	1.04	0.00	9.75
16.80	1.04	0.00	9.75
16.82	1.04	0.00	9.75
16.84	1.03	0.00	8.50
16.86	1.03	0.00	8.50
16.88	1.03	0.00	8.00
16.90	1.03	0.00	8.00
16.92	1.02	0.00	6.00
16.94	1.02	0.00	5.50
16.96	1.03	0.00	6.75
16.98	1.03	0.00	7.25
17.00	1.03	0.00	8.50
17.02	1.03	0.00	8.50
17.04	1.04	0.00	9.25
17.06	1.04	0.00	10.50
17.08	1.04	0.00	10.50
17.10	1.04	0.00	9.75
17.12	1.03	0.00	8.00
17.14	1.03	0.00	8.50
17.16	1.04	0.00	9.75
17.18	1.03	0.00	8.00
17.20	1.03	0.00	7.25
17.22	1.03	0.00	8.50
17.24	1.04	0.00	9.25
17.26	1.03	0.00	8.00
17.28	1.02	0.00	6.00
17.30	1.02	0.00	5.50
17.32	1.02	0.00	6.00
17.34	1.03	0.00	7.25
17.36	1.03	0.00	7.25
17.38	1.03	0.00	7.25
17.40	1.03	0.00	7.25
17.42	1.03	0.00	7.25
17.44	1.04	0.00	9.75
17.46	1.04	0.00	10.50
17.48	1.04	0.00	11.00
17.50	1.04	0.00	11.00
17.52	1.05	0.00	12.25
17.54	1.05	0.00	11.50
17.56	1.04	0.00	11.00
17.58	1.04	0.00	11.00
17.60	1.04	0.00	9.75
17.62	1.04	0.00	9.75
17.64	1.04	0.00	9.25
17.66	1.03	0.00	8.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E-68

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 19 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
17.68	1.04	0.00	9.25
17.70	1.04	0.00	9.25
17.72	1.04	0.00	9.75
17.74	1.04	0.00	9.25
17.76	1.03	0.00	8.50
17.78	1.03	0.00	8.50
17.80	1.03	0.00	7.25
17.82	1.03	0.00	8.50
17.84	1.04	0.00	9.25
17.86	1.03	0.00	8.00
17.88	1.03	0.00	8.50
17.90	1.03	0.00	8.50
17.92	1.04	0.00	9.75
17.94	1.05	0.00	12.25
17.96	1.05	0.00	13.50
17.98	1.05	0.00	12.25
18.00	1.04	0.00	10.50
18.02	1.04	0.00	10.50
18.04	1.05	0.00	11.50
18.06	1.05	0.00	12.25
18.08	1.05	0.00	11.50
18.10	1.04	0.00	9.75
18.12	1.04	0.00	9.25
18.14	1.04	0.00	10.50
18.16	1.04	0.00	11.00
18.18	1.05	0.00	11.50
18.20	1.04	0.00	10.50
18.22	1.04	0.00	9.25
18.24	1.04	0.00	9.25
18.26	1.03	0.00	7.25
18.28	1.02	0.00	5.50
18.30	1.02	0.00	6.00
18.32	1.03	0.00	6.75
18.34	1.03	0.00	7.25
18.36	1.03	0.00	6.75
18.38	1.02	0.00	6.00
18.40	1.03	0.00	6.75
18.42	1.03	0.00	8.00
18.44	1.04	0.00	9.25
18.46	1.04	0.00	10.50
18.48	1.04	0.00	11.00
18.50	1.05	0.00	11.50
18.52	1.04	0.00	11.00
18.54	1.04	0.00	11.00
18.56	1.04	0.00	10.50
18.58	1.04	0.00	10.50
18.60	1.04	0.00	10.50
18.62	1.04	0.00	9.75
18.64	1.04	0.00	10.50
18.66	1.05	0.00	12.25
18.68	1.05	0.00	12.75
18.70	1.05	0.00	12.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E69

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
18.72	1.04	0.00	10.50
18.74	1.04	0.00	9.75
18.76	1.04	0.00	9.75
18.78	1.04	0.00	9.75
18.80	1.03	0.00	8.50
18.82	1.03	0.00	8.00
18.84	1.03	0.00	8.50
18.86	1.04	0.00	9.25
18.88	1.03	0.00	8.00
18.90	1.03	0.00	6.75
18.92	1.02	0.00	5.50
18.94	1.02	0.00	5.50
18.96	1.03	0.00	6.75
18.98	1.02	0.00	6.00
19.00	1.02	0.00	6.00
19.02	1.02	0.00	5.50
19.04	1.02	0.00	6.00
19.06	1.02	0.00	5.50
19.08	1.02	0.00	5.50
19.10	1.02	0.00	5.00
19.12	1.02	0.00	4.25
19.14	1.02	0.00	4.25
19.16	1.02	0.00	3.75
19.18	1.02	0.00	3.75
19.20	1.02	0.00	5.00
19.22	1.02	0.00	5.50
19.24	1.02	0.00	6.00
19.26	1.02	0.00	6.00
19.28	1.02	0.00	5.50
19.30	1.02	0.00	5.50
19.32	1.02	0.00	6.00
19.34	1.02	0.00	5.50
19.36	1.03	0.00	6.75
19.38	1.03	0.00	8.00
19.40	1.03	0.00	8.00
19.42	1.03	0.00	7.25
19.44	1.02	0.00	5.50
19.46	1.02	0.00	5.50
19.48	1.02	0.00	6.00
19.50	1.03	0.00	7.25
19.52	1.03	0.00	7.25
19.54	1.03	0.00	7.25
19.56	1.03	0.00	8.00
19.58	1.04	0.00	9.75
19.60	1.04	0.00	9.25
19.62	1.03	0.00	8.50
19.64	1.03	0.00	7.25
19.66	1.03	0.00	7.25
19.68	1.03	0.00	7.25
19.70	1.02	0.00	6.00
19.72	1.02	0.00	5.50
19.74	1.02	0.00	5.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E70

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 21 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
19.76	1.02	0.00	5.50
19.78	1.02	0.00	5.00
19.80	1.02	0.00	4.25
19.82	1.02	0.00	5.00
19.84	1.02	0.00	5.00
19.86	1.02	0.00	5.50
19.88	1.02	0.00	5.00
19.90	1.02	0.00	5.00
19.92	1.02	0.00	6.00
19.94	1.02	0.00	6.00
19.96	1.03	0.00	6.75
19.98	1.03	0.00	6.75
20.00	1.03	0.00	6.75
20.02	1.03	0.00	6.75
20.04	1.03	0.00	6.75
20.06	1.02	0.00	6.00
20.08	1.03	0.00	8.00
20.10	1.03	0.00	8.50
20.12	1.03	0.00	8.00
20.14	1.03	0.00	7.25
20.16	1.02	0.00	6.00
20.18	1.03	0.00	6.75
20.20	1.03	0.00	8.00
20.22	1.03	0.00	8.00
20.24	1.03	0.00	8.00
20.26	1.03	0.00	6.75
20.28	1.03	0.00	7.25
20.30	1.03	0.00	8.50
20.32	1.04	0.00	9.25
20.34	1.04	0.00	9.75
20.36	1.04	0.00	9.25
20.38	1.04	0.00	9.25
20.40	1.03	0.00	8.50
20.42	1.03	0.00	8.00
20.44	1.03	0.00	8.50
20.46	1.03	0.00	8.50
20.48	1.04	0.00	9.25
20.50	1.04	0.00	9.75
20.52	1.04	0.00	9.75
20.54	1.04	0.00	10.50
20.56	1.04	0.00	10.50
20.58	1.04	0.00	11.00
20.60	1.04	0.00	9.25
20.62	1.03	0.00	8.50
20.64	1.04	0.00	9.25
20.66	1.03	0.00	8.00
20.68	1.03	0.00	8.00
20.70	1.03	0.00	8.00
20.72	1.03	0.00	8.00
20.74	1.04	0.00	9.25
20.76	1.03	0.00	8.50
20.78	1.03	0.00	8.00

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh. E71

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	1.04	0.00	9.25
20.82	1.04	0.00	11.00
20.84	1.04	0.00	11.00
20.86	1.04	0.00	11.00
20.88	1.04	0.00	11.00
20.90	1.05	0.00	12.25
20.92	1.05	0.00	12.75
20.94	1.06	0.00	14.00
20.96	1.05	0.00	13.50
20.98	1.05	0.00	12.25
21.00	1.05	0.00	12.25
21.02	1.05	0.00	11.50
21.04	1.04	0.00	11.00
21.06	1.04	0.00	10.50
21.08	1.04	0.00	9.75
21.10	1.04	0.00	9.75
21.12	1.04	0.00	10.50
21.14	1.04	0.00	9.75
21.16	1.04	0.00	10.50
21.18	1.04	0.00	10.50
21.20	1.04	0.00	11.00
21.22	1.04	0.00	10.50
21.24	1.04	0.00	10.50
21.26	1.04	0.00	10.50
21.28	1.04	0.00	9.75
21.30	1.04	0.00	10.50
21.32	1.04	0.00	10.50
21.34	1.04	0.00	10.50
21.36	1.04	0.00	11.00
21.38	1.04	0.00	10.50
21.40	1.04	0.00	10.50
21.42	1.04	0.00	10.50
21.44	1.04	0.00	11.00
21.46	1.05	0.00	11.50
21.48	1.04	0.00	11.00
21.50	1.04	0.00	11.00
21.52	1.05	0.00	12.75
21.54	1.05	0.00	13.50
21.56	1.05	0.00	13.50
21.58	1.05	0.00	11.50
21.60	1.04	0.00	9.25
21.62	1.04	0.00	9.25
21.64	1.04	0.00	10.50
21.66	1.04	0.00	10.50
21.68	1.04	0.00	10.50
21.70	1.04	0.00	9.75
21.72	1.04	0.00	10.50
21.74	1.05	0.00	11.50
21.76	1.05	0.00	11.50
21.78	1.05	0.00	11.50
21.80	1.04	0.00	11.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E72

Attachment 4 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 23 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
21.82	1.05	0.00	11.50
21.84	1.04	0.00	11.00
21.86	1.04	0.00	9.75
21.88	1.04	0.00	9.25
21.90	1.03	0.00	8.50
21.92	1.03	0.00	8.50
21.94	1.04	0.00	9.25
21.96	1.03	0.00	8.50
21.98	1.03	0.00	8.50
22.00	1.03	0.00	8.00
22.02	1.03	0.00	8.50
22.04	1.03	0.00	8.50
22.06	1.04	0.00	9.25
22.08	1.04	0.00	9.75
22.10	1.04	0.00	10.50
22.12	1.04	0.00	11.00
22.14	1.05	0.00	11.50
22.16	1.05	0.00	12.25
22.18	1.05	0.00	13.50
22.20	1.05	0.00	12.25
22.22	1.05	0.00	12.25
22.24	1.05	0.00	13.50
22.26	1.06	0.00	14.75
22.28	1.06	0.00	14.00
22.30	1.05	0.00	13.50
22.32	1.05	0.00	12.75
22.34	1.06	0.00	14.00
22.36	1.06	0.00	15.25
22.38	1.06	0.00	14.75
22.40	1.06	0.00	14.00
22.42	1.06	0.00	14.00
22.44	1.06	0.00	15.25
22.46	1.06	0.00	15.25
22.48	1.06	0.00	14.00
22.50	1.05	0.00	12.75
22.52	1.05	0.00	11.50
22.54	1.05	0.00	12.25
22.56	1.04	0.00	11.00
22.58	1.04	0.00	9.75
22.60	1.04	0.00	9.75
22.62	1.03	0.00	8.50
22.64	1.03	0.00	8.00
22.66	1.03	0.00	8.50
22.68	1.04	0.00	9.25
22.70	1.04	0.00	9.75
22.72	1.04	0.00	9.75
22.74	1.04	0.00	9.75
22.76	1.04	0.00	9.75
22.78	1.04	0.00	9.75
22.80	1.04	0.00	9.75
22.82	1.03	0.00	8.50
22.84	1.03	0.00	8.00

Altran Report
96227MR-01 Rev. 3
Att./Appx. E Sh E73

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.86	1.03	0.00	8.50
22.88	1.03	0.00	7.25
22.90	1.03	0.00	7.25
22.92	1.03	0.00	6.75
22.94	1.03	0.00	7.25
22.96	1.03	0.00	8.50
22.98	1.03	0.00	8.50
23.00	1.03	0.00	8.00
23.02	1.03	0.00	6.75
23.04	1.03	0.00	6.75
23.06	1.03	0.00	8.00
23.08	1.03	0.00	7.25
23.10	1.03	0.00	6.75
23.12	1.02	0.00	6.00
23.14	1.03	0.00	6.75
23.16	1.03	0.00	7.25
23.18	1.03	0.00	6.75
23.20	1.02	0.00	5.50
23.22	1.02	0.00	3.75
23.24	1.01	0.00	3.00
23.26	1.02	0.00	3.75
23.28	1.01	0.00	3.00
23.30	1.02	0.00	3.75
23.32	1.01	0.00	3.00
23.34	1.02	0.00	5.00
23.36	1.02	0.00	6.00
23.38	1.03	0.00	6.75
23.40	1.03	0.00	6.75
23.42	1.03	0.00	8.00
23.44	1.03	0.00	8.50
23.46	1.03	0.00	7.25
23.48	1.03	0.00	6.75
23.50	1.02	0.00	6.00
23.52	1.02	0.00	6.00
23.54	1.02	0.00	6.00
23.56	1.03	0.00	6.75
23.58	1.03	0.00	6.75
23.60	1.03	0.00	6.75
23.62	1.02	0.00	5.50
23.64	1.02	0.00	4.25
23.66	1.02	0.00	5.00
23.68	1.02	0.00	5.50
23.70	1.02	0.00	5.50
23.72	1.02	0.00	5.50
23.74	1.02	0.00	5.00
23.76	1.02	0.00	5.50
23.78	1.02	0.00	6.00
23.80	1.03	0.00	6.75
23.82	1.03	0.00	6.75
23.84	1.02	0.00	6.00
23.86	1.03	0.00	6.75
23.88	1.03	0.00	7.25

Altran Report
96227-TR-01 Rev. 3
Attach./Appx. E Sh. E74

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
23.90	1.03	0.00	7.25
23.92	1.03	0.00	8.50
23.94	1.03	0.00	8.50
23.96	1.04	0.00	9.25
23.98	1.03	0.00	8.50
24.00	1.02	0.00	6.00
24.02	1.02	0.00	5.00
24.04	1.02	0.00	4.25
24.06	1.02	0.00	4.25
24.08	1.02	0.00	5.00
24.10	1.02	0.00	5.50
24.12	1.03	0.00	6.75
24.14	1.03	0.00	7.25
24.16	1.03	0.00	8.50
24.18	1.04	0.00	9.25
24.20	1.04	0.00	9.25
24.22	1.04	0.00	9.75
24.24	1.04	0.00	9.75
24.26	1.04	0.00	9.75
24.28	1.04	0.00	9.25
24.30	1.03	0.00	8.50
24.32	1.03	0.00	8.00
24.34	1.03	0.00	8.00
24.36	1.03	0.00	8.50
24.38	1.04	0.00	10.50
24.40	1.05	0.00	12.25
24.42	1.05	0.00	11.50
24.44	1.04	0.00	9.75
24.46	1.03	0.00	8.00
24.48	1.03	0.00	8.00
24.50	1.03	0.00	8.00
24.52	1.03	0.00	8.00
24.54	1.03	0.00	8.50
24.56	1.03	0.00	6.75
24.58	1.02	0.00	6.00
24.60	1.03	0.00	6.75
24.62	1.03	0.00	6.75
24.64	1.03	0.00	7.25
24.66	1.03	0.00	6.75
24.68	1.03	0.00	8.00
24.70	1.03	0.00	8.00
24.72	1.02	0.00	6.00
24.74	1.02	0.00	6.00
24.76	1.02	0.00	5.50
24.78	1.02	0.00	5.50
24.80	1.02	0.00	5.50
24.82	1.02	0.00	5.00
24.84	1.02	0.00	6.00
24.86	1.03	0.00	6.75
24.88	1.03	0.00	8.00
24.90	1.03	0.00	7.25
24.92	1.03	0.00	8.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E75

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.94	1.03	0.00	8.50
24.96	1.03	0.00	8.00
24.98	1.03	0.00	8.00
25.00	1.03	0.00	7.25
25.02	1.03	0.00	7.25
25.04	1.03	0.00	8.50
25.06	1.03	0.00	8.00
25.08	1.03	0.00	7.25
25.10	1.03	0.00	8.00
25.12	1.04	0.00	9.25
25.14	1.04	0.00	9.25
25.16	1.04	0.00	9.25
25.18	1.03	0.00	7.25
25.20	1.03	0.00	8.00
25.22	1.03	0.00	8.50
25.24	1.03	0.00	8.50
25.26	1.03	0.00	8.50
25.28	1.03	0.00	7.25
25.30	1.03	0.00	8.00
25.32	1.03	0.00	8.50
25.34	1.03	0.00	8.50
25.36	1.03	0.00	8.50
25.38	1.03	0.00	8.00
25.40	1.03	0.00	8.50
25.42	1.04	0.00	9.25
25.44	1.03	0.00	8.00
25.46	1.03	0.00	8.50
25.48	1.03	0.00	8.50
25.50	1.03	0.00	8.50
25.52	1.04	0.00	9.75
25.54	1.04	0.00	9.75
25.56	1.04	0.00	10.50
25.58	1.04	0.00	9.75
25.60	1.04	0.00	9.75
25.62	1.03	0.00	8.50
25.64	1.03	0.00	8.50
25.66	1.04	0.00	9.25
25.68	1.03	0.00	8.00
25.70	1.03	0.00	7.25
25.72	1.03	0.00	8.00
25.74	1.03	0.00	8.00
25.76	1.03	0.00	8.00
25.78	1.03	0.00	7.25
25.80	1.03	0.00	7.25
25.82	1.04	0.00	9.25
25.84	1.05	0.00	12.25
25.86	1.05	0.00	11.50
25.88	1.04	0.00	10.50
25.90	1.03	0.00	8.50
25.92	1.04	0.00	9.25
25.94	1.04	0.00	9.25
25.96	1.04	0.00	9.25

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh E76

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
25.98	1.03	0.00	8.50
26.00	1.03	0.00	7.25
26.02	1.03	0.00	8.00
26.04	1.03	0.00	8.50
26.06	1.03	0.00	8.50
26.08	1.03	0.00	8.00
26.10	1.03	0.00	7.25
26.12	1.03	0.00	8.50
26.14	1.03	0.00	8.00
26.16	1.03	0.00	8.00
26.18	1.03	0.00	8.50
26.20	1.03	0.00	8.00
26.22	1.03	0.00	8.50
26.24	1.03	0.00	8.50
26.26	1.03	0.00	8.00
26.28	1.03	0.00	8.00
26.30	1.03	0.00	8.00
26.32	1.03	0.00	8.00
26.34	1.03	0.00	7.25
26.36	1.03	0.00	7.25
26.38	1.03	0.00	8.00
26.40	1.03	0.00	8.00
26.42	1.04	0.00	9.75
26.44	1.04	0.00	10.50
26.46	1.04	0.00	9.75
26.48	1.04	0.00	10.50
26.50	1.04	0.00	9.75
26.52	1.04	0.00	10.50
26.54	1.04	0.00	11.00
26.56	1.05	0.00	12.25
26.58	1.05	0.00	11.50
26.60	1.04	0.00	10.50
26.62	1.04	0.00	9.75
26.64	1.04	0.00	10.50
26.66	1.04	0.00	11.00
26.68	1.04	0.00	9.75
26.70	1.04	0.00	9.25
26.72	1.04	0.00	9.25
26.74	1.04	0.00	10.50
26.76	1.05	0.00	12.25
26.78	1.05	0.00	12.25
26.80	1.05	0.00	11.50
26.82	1.04	0.00	11.00
26.84	1.05	0.00	11.50
26.86	1.04	0.00	11.00
26.88	1.04	0.00	9.25
26.90	1.04	0.00	9.75
26.92	1.04	0.00	10.50
26.94	1.04	0.00	11.00
26.96	1.05	0.00	12.25
26.98	1.05	0.00	12.25
27.00	1.05	0.00	12.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E7

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.02	1.05	0.00	13.50
27.04	1.05	0.00	12.75
27.06	1.05	0.00	11.50
27.08	1.04	0.00	11.00
27.10	1.05	0.00	11.50
27.12	1.04	0.00	11.00
27.14	1.05	0.00	11.50
27.16	1.05	0.00	12.25
27.18	1.05	0.00	11.50
27.20	1.05	0.00	11.50
27.22	1.05	0.00	11.50
27.24	1.05	0.00	11.50
27.26	1.05	0.00	12.25
27.28	1.05	0.00	12.75
27.30	1.05	0.00	11.50
27.32	1.04	0.00	11.00
27.34	1.04	0.00	10.50
27.36	1.04	0.00	11.00
27.38	1.05	0.00	11.50
27.40	1.05	0.00	11.50
27.42	1.04	0.00	9.75
27.44	1.04	0.00	9.25
27.46	1.04	0.00	11.00
27.48	1.05	0.00	13.50
27.50	1.05	0.00	13.50
27.52	1.05	0.00	12.25
27.54	1.04	0.00	11.00
27.56	1.04	0.00	10.50
27.58	1.04	0.00	9.25
27.60	1.03	0.00	8.00
27.62	1.03	0.00	8.50
27.64	1.04	0.00	9.75
27.66	1.04	0.00	9.75
27.68	1.04	0.00	9.25
27.70	1.03	0.00	8.00
27.72	1.03	0.00	8.00
27.74	1.03	0.00	7.25
27.76	1.03	0.00	8.00
27.78	1.03	0.00	7.25
27.80	1.03	0.00	7.25
27.82	1.03	0.00	8.00
27.84	1.04	0.00	9.25
27.86	1.04	0.00	9.25
27.88	1.03	0.00	8.50
27.90	1.03	0.00	8.50
27.92	1.04	0.00	9.25
27.94	1.03	0.00	8.00
27.96	1.03	0.00	8.50
27.98	1.04	0.00	9.75
28.00	1.04	0.00	9.75
28.02	1.04	0.00	10.50
28.04	1.04	0.00	9.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E78

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
28.06	1.04	0.00	9.75
28.08	1.04	0.00	10.50
28.10	1.04	0.00	10.50
28.12	1.04	0.00	9.75
28.14	1.04	0.00	9.25
28.16	1.04	0.00	9.25
28.18	1.04	0.00	9.75
28.20	1.04	0.00	11.00
28.22	1.04	0.00	10.50
28.24	1.04	0.00	9.25
28.26	1.04	0.00	9.75
28.28	1.04	0.00	9.75
28.30	1.03	0.00	8.00
28.32	1.03	0.00	8.00
28.34	1.03	0.00	8.00
28.36	1.03	0.00	8.50
28.38	1.04	0.00	9.25
28.40	1.03	0.00	8.50
28.42	1.03	0.00	8.50
28.44	1.03	0.00	8.50
28.46	1.03	0.00	8.50
28.48	1.03	0.00	8.00
28.50	1.03	0.00	8.00
28.52	1.04	0.00	9.25
28.54	1.04	0.00	9.25
28.56	1.04	0.00	9.25
28.58	1.04	0.00	9.25
28.60	1.03	0.00	8.50
28.62	1.03	0.00	8.50
28.64	1.04	0.00	9.25
28.66	1.03	0.00	8.00
28.68	1.03	0.00	8.50
28.70	1.04	0.00	9.75
28.72	1.04	0.00	9.75
28.74	1.04	0.00	9.75
28.76	1.03	0.00	8.50
28.78	1.03	0.00	7.25
28.80	1.03	0.00	8.50
28.82	1.03	0.00	8.50
28.84	1.04	0.00	9.25
28.86	1.04	0.00	9.25
28.88	1.04	0.00	9.25
28.90	1.04	0.00	9.25
28.92	1.03	0.00	8.00
28.94	1.02	0.00	6.00
28.96	1.02	0.00	3.75
28.98	1.01	0.00	3.00
29.00	1.02	0.00	3.75
29.02	1.01	0.00	1.75
29.04	1.01	0.00	2.50
29.06	1.01	0.00	1.75
29.08	1.01	0.00	1.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E79

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.10	1.01	0.00	3.00
29.12	1.02	0.00	3.75
29.14	1.02	0.00	5.00
29.16	1.02	0.00	5.00
29.18	1.03	0.00	6.75
29.20	1.02	0.00	6.00
29.22	1.02	0.00	6.00
29.24	1.02	0.00	6.00
29.26	1.02	0.00	6.00
29.28	1.02	0.00	6.00
29.30	1.02	0.00	6.00
29.32	1.02	0.00	6.00
29.34	1.02	0.00	6.00
29.36	1.02	0.00	5.50
29.38	1.02	0.00	5.50
29.40	1.03	0.00	6.75
29.42	1.03	0.00	7.25
29.44	1.03	0.00	6.75
29.46	1.02	0.00	6.00
29.48	1.02	0.00	5.00
29.50	1.02	0.00	6.00
29.52	1.02	0.00	6.00
29.54	1.02	0.00	5.50
29.56	1.02	0.00	5.50
29.58	1.02	0.00	5.00
29.60	1.02	0.00	6.00
29.62	1.03	0.00	7.25
29.64	1.03	0.00	6.75
29.66	1.02	0.00	6.00
29.68	1.02	0.00	5.00
29.70	1.02	0.00	5.50
29.72	1.02	0.00	6.00
29.74	1.02	0.00	5.50
29.76	1.03	0.00	6.75
29.78	1.03	0.00	6.75
29.80	1.03	0.00	8.00
29.82	1.03	0.00	8.00
29.84	1.03	0.00	7.25
29.86	1.03	0.00	6.75
29.88	1.02	0.00	5.50
29.90	1.02	0.00	5.50
29.92	1.02	0.00	4.25
29.94	1.02	0.00	5.00
29.96	1.02	0.00	6.00
29.98	1.03	0.00	6.75
30.00	1.03	0.00	7.25

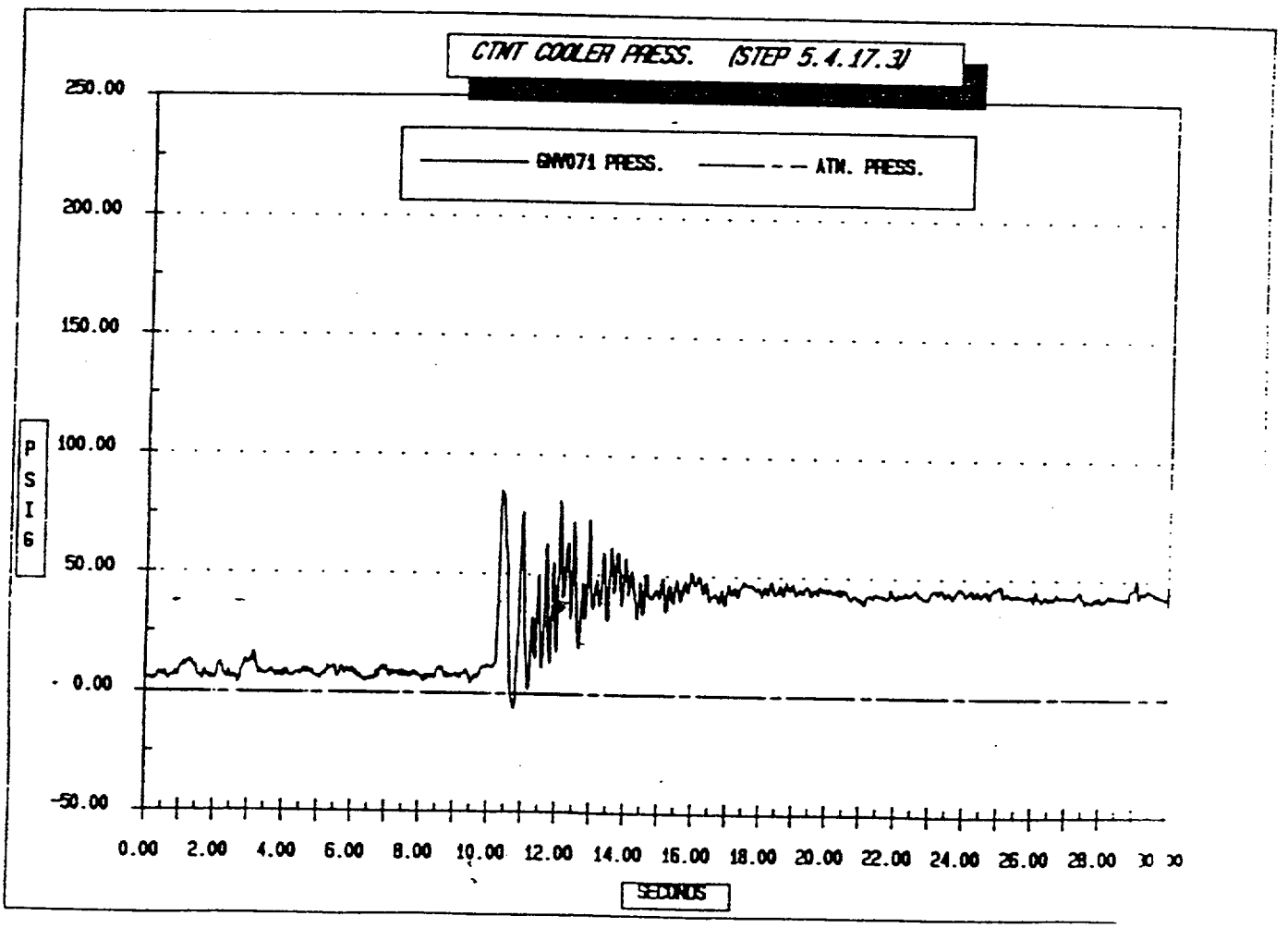
Altran Report
96227-MR-01 Rev. 3
Att/Appx. E Sh E80

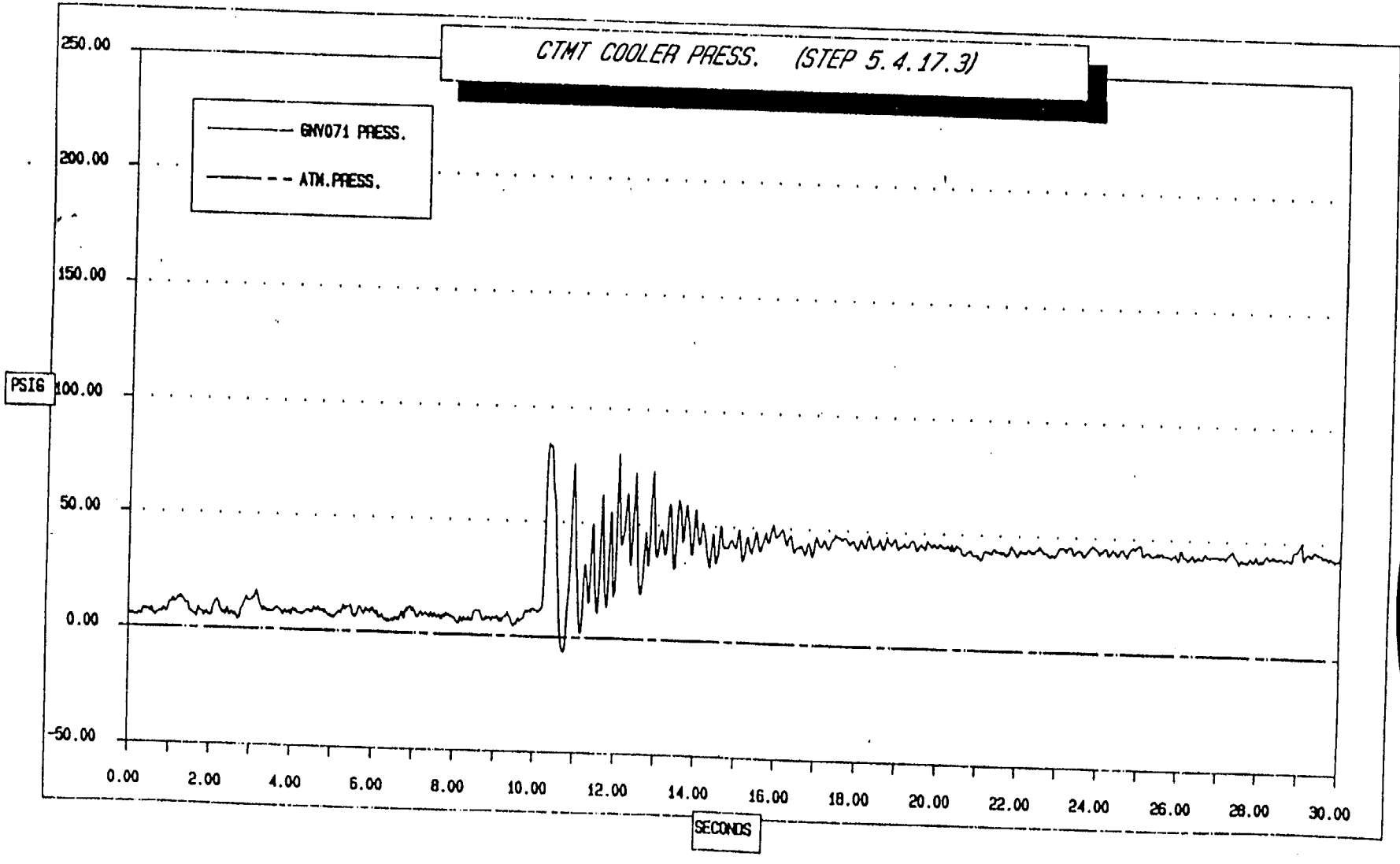
Data collected during step 5.4.17.3 ESW pump start following load reject test. Data shows ESW pump start after coastdown to zero shaft revolutions. Service water is cross connected to maintain system fill and pressure.

Test: STS KJ-0018 STEP 5.4.17.3	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	40401.00
Last Sample:	41901.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	808.00
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.34
Y-Axis Min Value:	0.98
Y-Axis Units:	VOLTS

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E81

Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: [illegible] Date: [illegible]
Verified By: [illegible] Date: 5/7/92
Sheet 1 of 31





Altran Report 9613-02-01 Rev. 3
Att/Appx. E Sh. E82

Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.02	0.00	6.00
0.02	1.02	0.00	6.00
0.04	1.02	0.00	5.50
0.06	1.02	0.00	5.50
0.08	1.02	0.00	6.00
0.10	1.02	0.00	6.00
0.12	1.02	0.00	5.50
0.14	1.02	0.00	5.00
0.16	1.02	0.00	5.00
0.18	1.02	0.00	5.50
0.20	1.02	0.00	5.00
0.22	1.02	0.00	5.00
0.24	1.02	0.00	6.00
0.26	1.02	0.00	6.00
0.28	1.02	0.00	6.00
0.30	1.02	0.00	5.50
0.32	1.02	0.00	6.00
0.34	1.03	0.00	8.00
0.36	1.03	0.00	8.50
0.38	1.03	0.00	8.00
0.40	1.03	0.00	7.25
0.42	1.03	0.00	7.25
0.44	1.03	0.00	8.00
0.46	1.03	0.00	8.00
0.48	1.03	0.00	7.25
0.50	1.03	0.00	6.75
0.52	1.03	0.00	7.25
0.54	1.03	0.00	8.50
0.56	1.03	0.00	8.00
0.58	1.02	0.00	6.00
0.60	1.02	0.00	6.00
0.62	1.02	0.00	6.00
0.64	1.02	0.00	5.00
0.66	1.02	0.00	5.50
0.68	1.02	0.00	6.00
0.70	1.03	0.00	6.75
0.72	1.03	0.00	6.75
0.74	1.03	0.00	6.75
0.76	1.03	0.00	6.75
0.78	1.03	0.00	7.25
0.80	1.03	0.00	6.75
0.82	1.03	0.00	7.25
0.84	1.03	0.00	8.50
0.86	1.03	0.00	8.00
0.88	1.03	0.00	8.00
0.90	1.03	0.00	7.25
0.92	1.03	0.00	6.75
0.94	1.03	0.00	8.00
0.96	1.04	0.00	9.75
0.98	1.04	0.00	11.00
1.00	1.04	0.00	11.00
1.02	1.04	0.00	10.50

Altran Report
96227-TR-01 Rev. 3
ATL/Appx. E Sh E83

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
1.04	1.04	0.00	11.00
1.06	1.05	0.00	12.25
1.08	1.05	0.00	12.75
1.10	1.05	0.00	12.25
1.12	1.04	0.00	11.00
1.14	1.04	0.00	11.00
1.16	1.05	0.00	11.50
1.18	1.05	0.00	12.75
1.20	1.05	0.00	13.50
1.22	1.05	0.00	12.75
1.24	1.05	0.00	13.50
1.26	1.05	0.00	13.50
1.28	1.05	0.00	12.75
1.30	1.05	0.00	13.50
1.32	1.05	0.00	12.25
1.34	1.05	0.00	12.25
1.36	1.05	0.00	11.50
1.38	1.04	0.00	10.50
1.40	1.04	0.00	10.50
1.42	1.04	0.00	10.50
1.44	1.04	0.00	11.00
1.46	1.04	0.00	9.25
1.48	1.03	0.00	7.25
1.50	1.03	0.00	7.25
1.52	1.03	0.00	6.75
1.54	1.03	0.00	7.25
1.56	1.03	0.00	6.75
1.58	1.02	0.00	6.00
1.60	1.02	0.00	6.00
1.62	1.02	0.00	6.00
1.64	1.02	0.00	5.00
1.66	1.03	0.00	6.75
1.68	1.03	0.00	8.50
1.70	1.04	0.00	9.25
1.72	1.03	0.00	8.50
1.74	1.03	0.00	7.25
1.76	1.03	0.00	7.25
1.78	1.03	0.00	7.25
1.80	1.03	0.00	7.25
1.82	1.03	0.00	7.25
1.84	1.02	0.00	5.50
1.86	1.02	0.00	6.00
1.88	1.03	0.00	7.25
1.90	1.03	0.00	7.25
1.92	1.03	0.00	7.25
1.94	1.02	0.00	6.00
1.96	1.02	0.00	6.00
1.98	1.02	0.00	6.00
2.00	1.02	0.00	5.50
2.02	1.02	0.00	6.00
2.04	1.03	0.00	6.75
2.06	1.03	0.00	8.50

Altran Report
96227-TR01 Rev. 3
Att. Appx. E Sh E84

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.04	0.00	9.75
2.10	1.04	0.00	11.00
2.12	1.05	0.00	12.25
2.14	1.05	0.00	12.25
2.16	1.05	0.00	12.75
2.18	1.05	0.00	12.25
2.20	1.04	0.00	11.00
2.22	1.04	0.00	10.50
2.24	1.03	0.00	8.50
2.26	1.03	0.00	8.00
2.28	1.03	0.00	8.00
2.30	1.03	0.00	6.75
2.32	1.03	0.00	7.25
2.34	1.03	0.00	6.75
2.36	1.02	0.00	6.00
2.38	1.03	0.00	8.00
2.40	1.04	0.00	9.25
2.42	1.03	0.00	8.50
2.44	1.03	0.00	8.00
2.46	1.02	0.00	6.00
2.48	1.02	0.00	6.00
2.50	1.03	0.00	6.75
2.52	1.03	0.00	7.25
2.54	1.03	0.00	7.25
2.56	1.02	0.00	6.00
2.58	1.02	0.00	6.00
2.60	1.03	0.00	7.25
2.62	1.03	0.00	6.75
2.64	1.02	0.00	5.50
2.66	1.02	0.00	4.25
2.68	1.02	0.00	4.25
2.70	1.02	0.00	5.00
2.72	1.02	0.00	5.00
2.74	1.03	0.00	7.25
2.76	1.03	0.00	8.50
2.78	1.04	0.00	9.75
2.80	1.04	0.00	10.50
2.82	1.04	0.00	11.00
2.84	1.05	0.00	12.25
2.86	1.05	0.00	12.75
2.88	1.06	0.00	14.00
2.90	1.06	0.00	14.00
2.92	1.05	0.00	12.75
2.94	1.05	0.00	12.25
2.96	1.05	0.00	12.25
2.98	1.05	0.00	12.25
3.00	1.05	0.00	12.75
3.02	1.05	0.00	12.75
3.04	1.06	0.00	14.00
3.06	1.05	0.00	13.50
3.08	1.05	0.00	13.50
3.10	1.06	0.00	15.25

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E-85

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
3.12	1.07	0.00	16.50
3.14	1.07	0.00	17.00
3.16	1.06	0.00	15.75
3.18	1.06	0.00	14.75
3.20	1.05	0.00	12.75
3.22	1.05	0.00	11.50
3.24	1.04	0.00	9.75
3.26	1.04	0.00	9.25
3.28	1.03	0.00	8.00
3.30	1.03	0.00	8.50
3.32	1.04	0.00	9.75
3.34	1.04	0.00	9.25
3.36	1.03	0.00	8.50
3.38	1.03	0.00	8.00
3.40	1.03	0.00	8.50
3.42	1.03	0.00	8.00
3.44	1.03	0.00	8.00
3.46	1.03	0.00	8.00
3.48	1.03	0.00	8.00
3.50	1.03	0.00	8.00
3.52	1.03	0.00	8.00
3.54	1.03	0.00	8.00
3.56	1.03	0.00	8.50
3.58	1.03	0.00	8.50
3.60	1.04	0.00	9.25
3.62	1.04	0.00	9.25
3.64	1.04	0.00	9.75
3.66	1.04	0.00	9.75
3.68	1.04	0.00	9.25
3.70	1.03	0.00	8.50
3.72	1.03	0.00	8.50
3.74	1.03	0.00	8.00
3.76	1.03	0.00	8.00
3.78	1.03	0.00	6.75
3.80	1.03	0.00	6.75
3.82	1.03	0.00	8.00
3.84	1.03	0.00	8.50
3.86	1.03	0.00	8.50
3.88	1.03	0.00	8.00
3.90	1.03	0.00	7.25
3.92	1.03	0.00	8.00
3.94	1.03	0.00	8.50
3.96	1.03	0.00	8.00
3.98	1.03	0.00	6.75
4.00	1.03	0.00	6.75
4.02	1.03	0.00	8.50
4.04	1.04	0.00	9.75
4.06	1.04	0.00	9.25
4.08	1.03	0.00	8.50
4.10	1.03	0.00	8.00
4.12	1.04	0.00	9.25
4.14	1.03	0.00	8.00

Altran Report
16227-TR-01 Rev. 3
Att./Appx. E Sh E86

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.03	0.00	7.25
4.18	1.03	0.00	7.25
4.20	1.03	0.00	7.25
4.22	1.03	0.00	7.25
4.24	1.03	0.00	7.25
4.26	1.03	0.00	6.75
4.28	1.03	0.00	7.25
4.30	1.03	0.00	7.25
4.32	1.03	0.00	8.00
4.34	1.03	0.00	8.00
4.36	1.03	0.00	8.50
4.38	1.03	0.00	8.50
4.40	1.03	0.00	8.50
4.42	1.03	0.00	8.50
4.44	1.03	0.00	8.50
4.46	1.03	0.00	8.00
4.48	1.03	0.00	8.50
4.50	1.03	0.00	8.00
4.52	1.03	0.00	8.00
4.54	1.04	0.00	9.25
4.56	1.04	0.00	10.50
4.58	1.04	0.00	9.75
4.60	1.04	0.00	9.25
4.62	1.03	0.00	8.50
4.64	1.04	0.00	9.75
4.66	1.04	0.00	10.50
4.68	1.04	0.00	9.75
4.70	1.03	0.00	8.50
4.72	1.03	0.00	8.50
4.74	1.04	0.00	9.25
4.76	1.04	0.00	9.25
4.78	1.03	0.00	8.50
4.80	1.03	0.00	8.50
4.82	1.03	0.00	8.00
4.84	1.04	0.00	9.25
4.86	1.03	0.00	8.00
4.88	1.03	0.00	7.25
4.90	1.03	0.00	7.25
4.92	1.03	0.00	6.75
4.94	1.03	0.00	7.25
4.96	1.03	0.00	6.75
4.98	1.03	0.00	6.75
5.00	1.02	0.00	6.00
5.02	1.03	0.00	6.75
5.04	1.03	0.00	6.75
5.06	1.02	0.00	6.00
5.08	1.03	0.00	6.75
5.10	1.03	0.00	7.25
5.12	1.03	0.00	8.00
5.14	1.03	0.00	8.00
5.16	1.03	0.00	8.50
5.18	1.03	0.00	8.50

Altran Report
96227-RR-01 Rev. 3
Att/Appx. E Sh. E-87

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
5.20	1.03	0.00	8.50
5.22	1.03	0.00	8.00
5.24	1.04	0.00	9.25
5.26	1.04	0.00	9.75
5.28	1.05	0.00	11.50
5.30	1.04	0.00	11.00
5.32	1.04	0.00	9.75
5.34	1.04	0.00	10.50
5.36	1.04	0.00	10.50
5.38	1.04	0.00	10.50
5.40	1.04	0.00	10.50
5.42	1.04	0.00	10.50
5.44	1.04	0.00	10.50
5.46	1.05	0.00	11.50
5.48	1.04	0.00	11.00
5.50	1.04	0.00	9.25
5.52	1.03	0.00	7.25
5.54	1.03	0.00	6.75
5.56	1.03	0.00	7.25
5.58	1.03	0.00	6.75
5.60	1.03	0.00	7.25
5.62	1.03	0.00	8.00
5.64	1.04	0.00	9.25
5.66	1.04	0.00	11.00
5.68	1.04	0.00	11.00
5.70	1.04	0.00	11.00
5.72	1.04	0.00	10.50
5.74	1.04	0.00	9.75
5.76	1.03	0.00	8.50
5.78	1.03	0.00	8.00
5.80	1.03	0.00	8.50
5.82	1.04	0.00	9.75
5.84	1.04	0.00	10.50
5.86	1.04	0.00	9.75
5.88	1.04	0.00	9.25
5.90	1.04	0.00	9.25
5.92	1.04	0.00	9.25
5.94	1.03	0.00	8.50
5.96	1.04	0.00	9.25
5.98	1.04	0.00	10.50
6.00	1.04	0.00	10.50
6.02	1.04	0.00	9.75
6.04	1.03	0.00	8.50
6.06	1.03	0.00	8.00
6.08	1.03	0.00	8.50
6.10	1.04	0.00	9.25
6.12	1.03	0.00	8.50
6.14	1.03	0.00	6.75
6.16	1.03	0.00	6.75
6.18	1.03	0.00	6.75
6.20	1.03	0.00	7.25
6.22	1.03	0.00	8.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E88

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.03	0.00	6.75
6.26	1.02	0.00	6.00
6.28	1.02	0.00	6.00
6.30	1.02	0.00	5.50
6.32	1.02	0.00	6.00
6.34	1.02	0.00	5.00
6.36	1.02	0.00	5.50
6.38	1.02	0.00	6.00
6.40	1.02	0.00	5.00
6.42	1.02	0.00	5.50
6.44	1.02	0.00	5.50
6.46	1.02	0.00	6.00
6.48	1.02	0.00	5.50
6.50	1.02	0.00	5.50
6.52	1.03	0.00	6.75
6.54	1.02	0.00	6.00
6.56	1.03	0.00	6.75
6.58	1.03	0.00	6.75
6.60	1.02	0.00	6.00
6.62	1.03	0.00	6.75
6.64	1.03	0.00	6.75
6.66	1.02	0.00	6.00
6.68	1.03	0.00	8.00
6.70	1.04	0.00	9.25
6.72	1.04	0.00	9.25
6.74	1.03	0.00	8.50
6.76	1.03	0.00	6.75
6.78	1.03	0.00	6.75
6.80	1.04	0.00	9.25
6.82	1.04	0.00	10.50
6.84	1.04	0.00	11.00
6.86	1.04	0.00	9.75
6.88	1.04	0.00	11.00
6.90	1.05	0.00	11.50
6.92	1.05	0.00	11.50
6.94	1.05	0.00	11.50
6.96	1.04	0.00	9.75
6.98	1.04	0.00	10.50
7.00	1.04	0.00	11.00
7.02	1.04	0.00	9.75
7.04	1.04	0.00	9.75
7.06	1.03	0.00	8.00
7.08	1.03	0.00	7.25
7.10	1.03	0.00	7.25
7.12	1.03	0.00	7.25
7.14	1.04	0.00	9.25
7.16	1.04	0.00	9.25
7.18	1.04	0.00	9.75
7.20	1.03	0.00	8.50
7.22	1.03	0.00	8.00
7.24	1.03	0.00	8.50
7.26	1.03	0.00	8.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E89

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
7.28	1.03	0.00	8.50
7.30	1.04	0.00	9.25
7.32	1.03	0.00	8.50
7.34	1.03	0.00	8.50
7.36	1.03	0.00	8.00
7.38	1.03	0.00	7.25
7.40	1.03	0.00	8.50
7.42	1.04	0.00	9.75
7.44	1.04	0.00	9.25
7.46	1.03	0.00	8.00
7.48	1.03	0.00	7.25
7.50	1.03	0.00	8.00
7.52	1.04	0.00	9.25
7.54	1.03	0.00	8.50
7.56	1.03	0.00	8.00
7.58	1.03	0.00	7.25
7.60	1.03	0.00	8.00
7.62	1.03	0.00	8.50
7.64	1.03	0.00	8.00
7.66	1.03	0.00	7.25
7.68	1.03	0.00	6.75
7.70	1.03	0.00	7.25
7.72	1.03	0.00	8.50
7.74	1.03	0.00	8.00
7.76	1.03	0.00	8.50
7.78	1.03	0.00	8.00
7.80	1.04	0.00	9.25
7.82	1.04	0.00	9.25
7.84	1.03	0.00	8.50
7.86	1.03	0.00	8.50
7.88	1.03	0.00	8.00
7.90	1.03	0.00	8.50
7.92	1.03	0.00	8.00
7.94	1.03	0.00	8.00
7.96	1.03	0.00	8.00
7.98	1.03	0.00	7.25
8.00	1.03	0.00	7.25
8.02	1.03	0.00	7.25
8.04	1.02	0.00	6.00
8.06	1.02	0.00	6.00
8.08	1.02	0.00	5.00
8.10	1.02	0.00	5.50
8.12	1.03	0.00	6.75
8.14	1.03	0.00	8.00
8.16	1.03	0.00	7.25
8.18	1.03	0.00	6.75
8.20	1.02	0.00	6.00
8.22	1.03	0.00	7.25
8.24	1.03	0.00	8.00
8.26	1.03	0.00	7.25
8.28	1.03	0.00	6.75
8.30	1.03	0.00	6.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E90

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.03	0.00	7.25
8.34	1.03	0.00	8.00
8.36	1.03	0.00	7.25
8.38	1.03	0.00	6.75
8.40	1.03	0.00	6.75
8.42	1.03	0.00	7.25
8.44	1.03	0.00	6.75
8.46	1.03	0.00	8.00
8.48	1.04	0.00	9.75
8.50	1.04	0.00	10.50
8.52	1.04	0.00	11.00
8.54	1.04	0.00	11.00
8.56	1.04	0.00	10.50
8.58	1.04	0.00	10.50
8.60	1.04	0.00	11.00
8.62	1.04	0.00	11.00
8.64	1.04	0.00	10.50
8.66	1.04	0.00	9.25
8.68	1.03	0.00	8.50
8.70	1.03	0.00	7.25
8.72	1.03	0.00	6.75
8.74	1.03	0.00	6.75
8.76	1.03	0.00	7.25
8.78	1.03	0.00	8.50
8.80	1.03	0.00	7.25
8.82	1.03	0.00	7.25
8.84	1.03	0.00	8.00
8.86	1.03	0.00	8.00
8.88	1.03	0.00	8.00
8.90	1.03	0.00	7.25
8.92	1.03	0.00	6.75
8.94	1.03	0.00	8.00
8.96	1.03	0.00	8.00
8.98	1.03	0.00	8.00
9.00	1.03	0.00	8.00
9.02	1.03	0.00	8.00
9.04	1.03	0.00	8.50
9.06	1.03	0.00	8.50
9.08	1.03	0.00	7.25
9.10	1.03	0.00	6.75
9.12	1.03	0.00	6.75
9.14	1.03	0.00	8.00
9.16	1.03	0.00	6.75
9.18	1.03	0.00	6.75
9.20	1.03	0.00	8.00
9.22	1.03	0.00	8.50
9.24	1.03	0.00	8.50
9.26	1.03	0.00	8.50
9.28	1.04	0.00	9.25
9.30	1.04	0.00	9.75
9.32	1.04	0.00	10.50
9.34	1.04	0.00	9.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E91

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
9.36	1.03	0.00	8.50
9.38	1.03	0.00	8.50
9.40	1.03	0.00	8.00
9.42	1.03	0.00	6.75
9.44	1.02	0.00	5.00
9.46	1.02	0.00	4.25
9.48	1.02	0.00	5.00
9.50	1.02	0.00	6.00
9.52	1.02	0.00	5.50
9.54	1.02	0.00	5.50
9.56	1.03	0.00	6.75
9.58	1.03	0.00	8.00
9.60	1.03	0.00	8.00
9.62	1.03	0.00	7.25
9.64	1.03	0.00	6.75
9.66	1.03	0.00	7.25
9.68	1.03	0.00	8.00
9.70	1.03	0.00	8.00
9.72	1.03	0.00	8.00
9.74	1.04	0.00	9.25
9.76	1.04	0.00	10.50
9.78	1.05	0.00	11.50
9.80	1.04	0.00	11.00
9.82	1.04	0.00	11.00
9.84	1.04	0.00	11.00
9.86	1.05	0.00	11.50
9.88	1.05	0.00	11.50
9.90	1.04	0.00	11.00
9.92	1.05	0.00	12.25
9.94	1.05	0.00	12.25
9.96	1.05	0.00	12.25
9.98	1.05	0.00	12.25
10.00	1.05	0.00	11.50
10.02	1.05	0.00	11.50
10.04	1.05	0.00	11.50
10.06	1.05	0.00	11.50
10.08	1.04	0.00	11.00
10.10	1.04	0.00	11.00
10.12	1.05	0.00	11.50
10.14	1.05	0.00	11.50
10.16	1.05	0.00	12.75
10.18	1.05	0.00	12.75
10.20	1.06	0.00	14.00
10.22	1.08	0.00	19.00
10.24	1.12	0.00	29.25
10.26	1.19	0.00	46.50
10.28	1.27	0.00	67.25
10.30	1.32	0.00	80.50
10.32	1.34	0.00	84.75
10.34	1.34	0.00	83.75
10.36	1.33	0.00	83.00
10.38	1.34	0.00	83.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E92

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	1.33	0.00	81.25
10.42	1.30	0.00	75.75
10.44	1.28	0.00	69.00
10.46	1.26	0.00	64.00
10.48	1.25	0.00	62.25
10.50	1.24	0.00	59.25
10.52	1.21	0.00	53.00
10.54	1.17	0.00	43.25
10.56	1.13	0.00	32.25
10.58	1.09	0.00	21.25
10.60	1.05	0.00	13.50
10.62	1.02	0.00	6.00
10.64	1.01	0.00	1.25
10.66	0.99	0.00	-1.82
10.68	0.99	0.00	-3.68
10.70	0.98	0.00	-5.50
10.72	0.98	0.00	-5.50
10.74	0.98	0.00	-6.10
10.76	0.98	0.00	-4.87
10.78	0.99	0.00	-1.82
10.80	1.02	0.00	4.25
10.82	1.05	0.00	12.25
10.84	1.08	0.00	20.25
10.86	1.12	0.00	30.00
10.88	1.17	0.00	42.75
10.90	1.23	0.00	57.50
10.92	1.28	0.00	70.25
10.94	1.31	0.00	76.25
10.96	1.29	0.00	73.25
10.98	1.25	0.00	63.50
11.00	1.21	0.00	52.00
11.02	1.16	0.00	40.25
11.04	1.13	0.00	31.25
11.06	1.09	0.00	22.50
11.08	1.06	0.00	15.25
11.10	1.04	0.00	9.25
11.12	1.02	0.00	5.00
11.14	1.01	0.00	2.50
11.16	1.01	0.00	2.50
11.18	1.02	0.00	5.50
11.20	1.05	0.00	12.75
11.22	1.09	0.00	22.50
11.24	1.12	0.00	30.50
11.26	1.13	0.00	32.25
11.28	1.12	0.00	30.00
11.30	1.10	0.00	23.75
11.32	1.07	0.00	18.25
11.34	1.06	0.00	15.25
11.36	1.06	0.00	15.75
11.38	1.10	0.00	23.75
11.40	1.15	0.00	37.25
11.42	1.19	0.00	48.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E93

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
11.44	1.20	0.00	50.00
11.46	1.18	0.00	44.00
11.48	1.13	0.00	33.50
11.50	1.10	0.00	24.50
11.52	1.07	0.00	16.50
11.54	1.05	0.00	12.25
11.56	1.04	0.00	11.00
11.58	1.06	0.00	15.75
11.60	1.11	0.00	26.25
11.62	1.18	0.00	44.50
11.64	1.24	0.00	60.50
11.66	1.25	0.00	63.00
11.68	1.22	0.00	54.25
11.70	1.16	0.00	41.00
11.72	1.12	0.00	28.75
11.74	1.08	0.00	20.75
11.76	1.06	0.00	15.25
11.78	1.05	0.00	13.50
11.80	1.07	0.00	17.00
11.82	1.12	0.00	29.25
11.84	1.18	0.00	45.75
11.86	1.22	0.00	55.50
11.88	1.22	0.00	55.00
11.90	1.18	0.00	45.75
11.92	1.14	0.00	34.25
11.94	1.10	0.00	23.75
11.96	1.07	0.00	18.25
11.98	1.08	0.00	20.75
12.00	1.15	0.00	36.75
12.02	1.26	0.00	64.75
12.04	1.33	0.00	81.25
12.06	1.32	0.00	78.75
12.08	1.26	0.00	66.00
12.10	1.21	0.00	53.00
12.12	1.18	0.00	44.00
12.14	1.16	0.00	41.00
12.16	1.17	0.00	41.50
12.18	1.18	0.00	44.00
12.20	1.19	0.00	47.50
12.22	1.21	0.00	52.00
12.24	1.23	0.00	58.00
12.26	1.25	0.00	63.00
12.28	1.25	0.00	63.50
12.30	1.24	0.00	59.25
12.32	1.21	0.00	51.25
12.34	1.17	0.00	42.00
12.36	1.14	0.00	34.75
12.38	1.13	0.00	32.25
12.40	1.15	0.00	36.75
12.42	1.20	0.00	49.50
12.44	1.26	0.00	65.25
12.46	1.29	0.00	72.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E94

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	1.27	0.00	68.50
12.50	1.23	0.00	57.50
12.52	1.18	0.00	45.75
12.54	1.14	0.00	34.75
12.56	1.11	0.00	28.00
12.58	1.09	0.00	23.25
12.60	1.08	0.00	20.25
12.62	1.08	0.00	19.50
12.64	1.09	0.00	21.25
12.66	1.11	0.00	26.75
12.68	1.14	0.00	34.75
12.70	1.17	0.00	42.75
12.72	1.19	0.00	47.00
12.74	1.19	0.00	46.50
12.76	1.16	0.00	41.00
12.78	1.14	0.00	36.00
12.80	1.13	0.00	32.25
12.82	1.14	0.00	34.25
12.84	1.17	0.00	42.75
12.86	1.23	0.00	58.50
12.88	1.29	0.00	72.00
12.90	1.30	0.00	73.75
12.92	1.27	0.00	67.25
12.94	1.23	0.00	56.25
12.96	1.19	0.00	46.50
12.98	1.16	0.00	39.75
13.00	1.15	0.00	36.75
13.02	1.14	0.00	36.00
13.04	1.15	0.00	37.75
13.06	1.16	0.00	40.25
13.08	1.17	0.00	43.25
13.10	1.19	0.00	46.50
13.12	1.19	0.00	48.25
13.14	1.19	0.00	47.50
13.16	1.18	0.00	44.00
13.18	1.16	0.00	40.25
13.20	1.15	0.00	38.50
13.22	1.15	0.00	37.25
13.24	1.15	0.00	38.50
13.26	1.17	0.00	42.00
13.28	1.20	0.00	48.75
13.30	1.23	0.00	56.25
13.32	1.24	0.00	59.75
13.34	1.23	0.00	58.00
13.36	1.21	0.00	52.00
13.38	1.18	0.00	44.50
13.40	1.15	0.00	38.50
13.42	1.13	0.00	33.50
13.44	1.13	0.00	31.25
13.46	1.13	0.00	31.75
13.48	1.15	0.00	37.75
13.50	1.19	0.00	47.00

Altran Report
916227-TR-01 Rev. 3
Att/Appx. E Sh E95

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
13.52	1.23	0.00	56.25
13.54	1.25	0.00	61.75
13.56	1.24	0.00	61.00
13.58	1.23	0.00	58.00
13.60	1.21	0.00	53.00
13.62	1.19	0.00	47.00
13.64	1.17	0.00	43.25
13.66	1.18	0.00	44.00
13.68	1.19	0.00	48.25
13.70	1.22	0.00	54.25
13.72	1.23	0.00	58.50
13.74	1.24	0.00	59.75
13.76	1.23	0.00	57.50
13.78	1.22	0.00	54.25
13.80	1.20	0.00	50.00
13.82	1.18	0.00	45.25
13.84	1.16	0.00	41.00
13.86	1.15	0.00	37.75
13.88	1.15	0.00	37.75
13.90	1.16	0.00	41.00
13.92	1.18	0.00	45.75
13.94	1.21	0.00	53.00
13.96	1.23	0.00	57.50
13.98	1.23	0.00	57.50
14.00	1.21	0.00	53.00
14.02	1.20	0.00	49.50
14.04	1.18	0.00	45.25
14.06	1.17	0.00	42.00
14.08	1.17	0.00	42.75
14.10	1.19	0.00	46.50
14.12	1.20	0.00	49.50
14.14	1.21	0.00	52.00
14.16	1.20	0.00	50.75
14.18	1.20	0.00	49.50
14.20	1.19	0.00	47.50
14.22	1.18	0.00	45.75
14.24	1.17	0.00	42.75
14.26	1.16	0.00	39.00
14.28	1.14	0.00	35.50
14.30	1.13	0.00	33.00
14.32	1.13	0.00	32.25
14.34	1.14	0.00	34.75
14.36	1.16	0.00	39.00
14.38	1.18	0.00	44.50
14.40	1.19	0.00	47.50
14.42	1.19	0.00	46.50
14.44	1.17	0.00	42.75
14.46	1.15	0.00	37.75
14.48	1.14	0.00	34.25
14.50	1.14	0.00	34.75
14.52	1.15	0.00	37.75
14.54	1.17	0.00	43.25

Altran Report
96227-SR-01 Rev. 3
Att/Appx. E Sh E96

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	1.19	0.00	48.25
14.58	1.20	0.00	50.75
14.60	1.20	0.00	50.75
14.62	1.19	0.00	47.50
14.64	1.18	0.00	44.50
14.66	1.17	0.00	42.00
14.68	1.16	0.00	41.00
14.70	1.17	0.00	41.50
14.72	1.16	0.00	41.00
14.74	1.16	0.00	41.00
14.76	1.16	0.00	41.00
14.78	1.16	0.00	41.00
14.80	1.17	0.00	42.00
14.82	1.17	0.00	43.25
14.84	1.18	0.00	44.00
14.86	1.18	0.00	44.50
14.88	1.18	0.00	44.50
14.90	1.18	0.00	44.50
14.92	1.17	0.00	43.25
14.94	1.17	0.00	42.00
14.96	1.16	0.00	41.00
14.98	1.16	0.00	41.00
15.00	1.17	0.00	43.25
15.02	1.19	0.00	46.50
15.04	1.20	0.00	48.75
15.06	1.20	0.00	49.50
15.08	1.19	0.00	47.00
15.10	1.18	0.00	44.00
15.12	1.16	0.00	41.00
15.14	1.15	0.00	37.25
15.16	1.14	0.00	35.50
15.18	1.14	0.00	36.00
15.20	1.15	0.00	38.50
15.22	1.17	0.00	42.00
15.24	1.18	0.00	45.25
15.26	1.19	0.00	46.50
15.28	1.18	0.00	45.75
15.30	1.18	0.00	44.00
15.32	1.17	0.00	42.00
15.34	1.16	0.00	40.25
15.36	1.16	0.00	39.75
15.38	1.16	0.00	39.00
15.40	1.16	0.00	41.00
15.42	1.17	0.00	43.25
15.44	1.19	0.00	46.50
15.46	1.19	0.00	48.25
15.48	1.20	0.00	48.75
15.50	1.19	0.00	47.50
15.52	1.18	0.00	45.75
15.54	1.17	0.00	43.25
15.56	1.16	0.00	41.00
15.58	1.16	0.00	40.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E97

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
15.60	1.16	0.00	40.25
15.62	1.17	0.00	41.50
15.64	1.17	0.00	42.75
15.66	1.18	0.00	44.50
15.68	1.19	0.00	46.50
15.70	1.19	0.00	47.50
15.72	1.19	0.00	48.25
15.74	1.19	0.00	47.00
15.76	1.18	0.00	45.25
15.78	1.18	0.00	44.00
15.80	1.18	0.00	44.00
15.82	1.18	0.00	44.50
15.84	1.19	0.00	46.50
15.86	1.19	0.00	48.25
15.88	1.20	0.00	50.00
15.90	1.21	0.00	52.00
15.92	1.21	0.00	51.25
15.94	1.20	0.00	49.50
15.96	1.19	0.00	47.50
15.98	1.19	0.00	46.50
16.00	1.19	0.00	46.50
16.02	1.19	0.00	47.00
16.04	1.19	0.00	47.00
16.06	1.19	0.00	47.50
16.08	1.19	0.00	48.25
16.10	1.20	0.00	49.50
16.12	1.20	0.00	50.00
16.14	1.20	0.00	49.50
16.16	1.20	0.00	48.75
16.18	1.19	0.00	47.50
16.20	1.18	0.00	45.75
16.22	1.18	0.00	44.50
16.24	1.17	0.00	43.25
16.26	1.17	0.00	43.25
16.28	1.18	0.00	45.25
16.30	1.19	0.00	46.50
16.32	1.19	0.00	47.00
16.34	1.19	0.00	47.50
16.36	1.18	0.00	45.75
16.38	1.17	0.00	43.25
16.40	1.17	0.00	41.50
16.42	1.16	0.00	40.25
16.44	1.16	0.00	40.25
16.46	1.17	0.00	41.50
16.48	1.17	0.00	41.50
16.50	1.17	0.00	42.00
16.52	1.17	0.00	42.00
16.54	1.17	0.00	42.00
16.56	1.17	0.00	42.00
16.58	1.17	0.00	43.25
16.60	1.17	0.00	43.25
16.62	1.17	0.00	42.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E98

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	1.17	0.00	41.50
16.66	1.16	0.00	41.00
16.68	1.16	0.00	39.75
16.70	1.16	0.00	39.00
16.72	1.16	0.00	39.75
16.74	1.16	0.00	40.25
16.76	1.17	0.00	42.75
16.78	1.18	0.00	44.50
16.80	1.18	0.00	44.50
16.82	1.17	0.00	43.25
16.84	1.17	0.00	41.50
16.86	1.16	0.00	39.00
16.88	1.15	0.00	38.50
16.90	1.16	0.00	39.00
16.92	1.16	0.00	40.25
16.94	1.17	0.00	42.75
16.96	1.18	0.00	45.25
16.98	1.19	0.00	47.00
17.00	1.19	0.00	47.00
17.02	1.18	0.00	45.75
17.04	1.18	0.00	44.00
17.06	1.17	0.00	43.25
17.08	1.17	0.00	42.75
17.10	1.17	0.00	42.75
17.12	1.17	0.00	43.25
17.14	1.18	0.00	44.50
17.16	1.18	0.00	45.75
17.18	1.18	0.00	45.75
17.20	1.18	0.00	45.25
17.22	1.18	0.00	44.50
17.24	1.17	0.00	43.25
17.26	1.17	0.00	42.00
17.28	1.17	0.00	42.00
17.30	1.17	0.00	42.75
17.32	1.18	0.00	44.00
17.34	1.18	0.00	45.25
17.36	1.18	0.00	45.75
17.38	1.19	0.00	46.50
17.40	1.19	0.00	46.50
17.42	1.19	0.00	47.00
17.44	1.19	0.00	48.25
17.46	1.19	0.00	48.25
17.48	1.19	0.00	47.50
17.50	1.19	0.00	47.50
17.52	1.19	0.00	47.00
17.54	1.19	0.00	47.00
17.56	1.19	0.00	47.00
17.58	1.19	0.00	46.50
17.60	1.19	0.00	46.50
17.62	1.19	0.00	46.50
17.64	1.19	0.00	46.50
17.66	1.19	0.00	47.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E99

Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 19 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
17.68	1.19	0.00	47.00
17.70	1.19	0.00	47.00
17.72	1.19	0.00	46.50
17.74	1.18	0.00	45.75
17.76	1.18	0.00	45.25
17.78	1.18	0.00	44.50
17.80	1.18	0.00	44.50
17.82	1.18	0.00	44.50
17.84	1.18	0.00	45.25
17.86	1.18	0.00	45.25
17.88	1.18	0.00	45.75
17.90	1.18	0.00	45.75
17.92	1.18	0.00	45.25
17.94	1.18	0.00	44.00
17.96	1.17	0.00	42.75
17.98	1.17	0.00	42.00
18.00	1.17	0.00	42.00
18.02	1.17	0.00	43.25
18.04	1.18	0.00	44.50
18.06	1.19	0.00	46.50
18.08	1.19	0.00	46.50
18.10	1.18	0.00	45.75
18.12	1.18	0.00	45.25
18.14	1.18	0.00	44.00
18.16	1.17	0.00	43.25
18.18	1.17	0.00	43.25
18.20	1.18	0.00	44.50
18.22	1.19	0.00	46.50
18.24	1.19	0.00	47.50
18.26	1.19	0.00	48.25
18.28	1.19	0.00	48.25
18.30	1.19	0.00	47.50
18.32	1.18	0.00	45.75
18.34	1.18	0.00	44.50
18.36	1.17	0.00	43.25
18.38	1.17	0.00	42.75
18.40	1.17	0.00	43.25
18.42	1.18	0.00	44.00
18.44	1.18	0.00	44.00
18.46	1.18	0.00	44.00
18.48	1.18	0.00	44.00
18.50	1.18	0.00	45.25
18.52	1.19	0.00	46.50
18.54	1.19	0.00	47.00
18.56	1.18	0.00	45.75
18.58	1.18	0.00	44.50
18.60	1.18	0.00	44.00
18.62	1.17	0.00	42.75
18.64	1.17	0.00	42.75
18.66	1.18	0.00	44.50
18.68	1.18	0.00	45.75
18.70	1.19	0.00	47.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E100

Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 20 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
19.76	1.18	0.00	45.75
19.78	1.18	0.00	45.25
19.80	1.18	0.00	44.50
19.82	1.18	0.00	44.50
19.84	1.18	0.00	44.50
19.86	1.18	0.00	45.75
19.88	1.18	0.00	45.75
19.90	1.18	0.00	45.25
19.92	1.18	0.00	44.50
19.94	1.18	0.00	44.50
19.96	1.18	0.00	44.00
19.98	1.18	0.00	44.50
20.00	1.18	0.00	45.75
20.02	1.18	0.00	45.75
20.04	1.18	0.00	45.25
20.06	1.18	0.00	44.50
20.08	1.18	0.00	44.50
20.10	1.18	0.00	44.00
20.12	1.18	0.00	44.50
20.14	1.18	0.00	44.50
20.16	1.18	0.00	44.00
20.18	1.18	0.00	44.50
20.20	1.18	0.00	44.50
20.22	1.18	0.00	45.25
20.24	1.18	0.00	44.00
20.26	1.18	0.00	44.00
20.28	1.17	0.00	43.25
20.30	1.18	0.00	45.25
20.32	1.18	0.00	45.75
20.34	1.18	0.00	44.50
20.36	1.17	0.00	43.25
20.38	1.17	0.00	43.25
20.40	1.18	0.00	44.00
20.42	1.18	0.00	44.50
20.44	1.18	0.00	45.25
20.46	1.18	0.00	45.25
20.48	1.18	0.00	44.50
20.50	1.18	0.00	44.50
20.52	1.18	0.00	44.50
20.54	1.18	0.00	44.00
20.56	1.17	0.00	43.25
20.58	1.17	0.00	42.00
20.60	1.17	0.00	41.50
20.62	1.17	0.00	41.50
20.64	1.17	0.00	41.50
20.66	1.16	0.00	41.00
20.68	1.17	0.00	41.50
20.70	1.17	0.00	42.00
20.72	1.17	0.00	42.75
20.74	1.17	0.00	42.75
20.76	1.17	0.00	43.25
20.78	1.17	0.00	43.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E101

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	1.17	0.00	42.75
20.82	1.17	0.00	42.00
20.84	1.17	0.00	41.50
20.86	1.16	0.00	41.00
20.88	1.16	0.00	41.00
20.90	1.16	0.00	41.00
20.92	1.17	0.00	41.50
20.94	1.17	0.00	41.50
20.96	1.16	0.00	40.25
20.98	1.16	0.00	41.00
21.00	1.16	0.00	40.25
21.02	1.16	0.00	39.75
21.04	1.16	0.00	39.00
21.06	1.16	0.00	39.75
21.08	1.16	0.00	40.25
21.10	1.17	0.00	41.50
21.12	1.17	0.00	42.75
21.14	1.17	0.00	43.25
21.16	1.17	0.00	43.25
21.18	1.17	0.00	43.25
21.20	1.17	0.00	42.75
21.22	1.17	0.00	43.25
21.24	1.17	0.00	42.75
21.26	1.17	0.00	42.75
21.28	1.17	0.00	42.00
21.30	1.17	0.00	42.00
21.32	1.17	0.00	42.00
21.34	1.17	0.00	43.25
21.36	1.18	0.00	44.00
21.38	1.18	0.00	44.00
21.40	1.18	0.00	44.00
21.42	1.17	0.00	43.25
21.44	1.17	0.00	43.25
21.46	1.17	0.00	43.25
21.48	1.17	0.00	43.25
21.50	1.17	0.00	42.75
21.52	1.17	0.00	42.75
21.54	1.17	0.00	43.25
21.56	1.17	0.00	42.75
21.58	1.17	0.00	42.00
21.60	1.17	0.00	42.75
21.62	1.17	0.00	42.75
21.64	1.17	0.00	42.00
21.66	1.17	0.00	41.50
21.68	1.17	0.00	41.50
21.70	1.17	0.00	42.00
21.72	1.17	0.00	42.00
21.74	1.17	0.00	42.00
21.76	1.17	0.00	43.25
21.78	1.18	0.00	45.25
21.80	1.18	0.00	45.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E102

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
21.82	1.18	0.00	45.25
21.84	1.18	0.00	44.50
21.86	1.18	0.00	44.00
21.88	1.17	0.00	43.25
21.90	1.17	0.00	42.75
21.92	1.17	0.00	42.00
21.94	1.17	0.00	41.50
21.96	1.17	0.00	41.50
21.98	1.17	0.00	42.00
22.00	1.17	0.00	42.75
22.02	1.18	0.00	44.00
22.04	1.18	0.00	44.00
22.06	1.17	0.00	43.25
22.08	1.17	0.00	43.25
22.10	1.17	0.00	43.25
22.12	1.17	0.00	43.25
22.14	1.17	0.00	43.25
22.16	1.17	0.00	42.75
22.18	1.17	0.00	42.75
22.20	1.18	0.00	44.00
22.22	1.18	0.00	44.50
22.24	1.18	0.00	44.50
22.26	1.18	0.00	44.00
22.28	1.18	0.00	44.00
22.30	1.17	0.00	43.25
22.32	1.17	0.00	43.25
22.34	1.17	0.00	43.25
22.36	1.17	0.00	43.25
22.38	1.17	0.00	43.25
22.40	1.18	0.00	44.00
22.42	1.18	0.00	44.00
22.44	1.18	0.00	44.50
22.46	1.18	0.00	44.50
22.48	1.18	0.00	44.50
22.50	1.18	0.00	45.75
22.52	1.18	0.00	45.75
22.54	1.18	0.00	44.50
22.56	1.18	0.00	44.50
22.58	1.18	0.00	44.00
22.60	1.17	0.00	43.25
22.62	1.17	0.00	43.25
22.64	1.17	0.00	43.25
22.66	1.17	0.00	42.75
22.68	1.17	0.00	43.25
22.70	1.17	0.00	42.75
22.72	1.17	0.00	42.00
22.74	1.17	0.00	41.50
22.76	1.17	0.00	41.50
22.78	1.17	0.00	42.00
22.80	1.17	0.00	42.00
22.82	1.17	0.00	42.00
22.84	1.17	0.00	42.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E103

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.86	1.17	0.00	41.50
22.88	1.17	0.00	41.50
22.90	1.17	0.00	42.00
22.92	1.17	0.00	42.75
22.94	1.17	0.00	43.25
22.96	1.18	0.00	44.00
22.98	1.18	0.00	44.50
23.00	1.18	0.00	45.25
23.02	1.18	0.00	45.25
23.04	1.18	0.00	45.25
23.06	1.18	0.00	45.25
23.08	1.18	0.00	45.25
23.10	1.18	0.00	45.25
23.12	1.18	0.00	45.25
23.14	1.18	0.00	44.50
23.16	1.18	0.00	44.00
23.18	1.18	0.00	44.00
23.20	1.18	0.00	45.25
23.22	1.18	0.00	45.25
23.24	1.18	0.00	45.75
23.26	1.18	0.00	45.75
23.28	1.18	0.00	45.75
23.30	1.18	0.00	45.75
23.32	1.18	0.00	44.50
23.34	1.17	0.00	43.25
23.36	1.17	0.00	42.75
23.38	1.17	0.00	42.75
23.40	1.17	0.00	43.25
23.42	1.18	0.00	44.00
23.44	1.18	0.00	44.00
23.46	1.18	0.00	44.50
23.48	1.18	0.00	44.50
23.50	1.18	0.00	44.50
23.52	1.18	0.00	44.00
23.54	1.18	0.00	44.00
23.56	1.17	0.00	42.75
23.58	1.17	0.00	42.00
23.60	1.17	0.00	42.00
23.62	1.17	0.00	42.00
23.64	1.17	0.00	42.75
23.66	1.17	0.00	43.25
23.68	1.18	0.00	44.00
23.70	1.18	0.00	44.00
23.72	1.18	0.00	45.25
23.74	1.18	0.00	45.25
23.76	1.18	0.00	45.25
23.78	1.19	0.00	46.50
23.80	1.19	0.00	46.50
23.82	1.19	0.00	46.50
23.84	1.19	0.00	46.50
23.86	1.18	0.00	45.75
23.88	1.18	0.00	45.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E104

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
23.90	1.18	0.00	45.25
23.92	1.18	0.00	45.25
23.94	1.18	0.00	44.50
23.96	1.18	0.00	44.00
23.98	1.17	0.00	43.25
24.00	1.17	0.00	43.25
24.02	1.18	0.00	44.00
24.04	1.18	0.00	44.00
24.06	1.18	0.00	44.00
24.08	1.18	0.00	44.50
24.10	1.18	0.00	45.25
24.12	1.18	0.00	45.75
24.14	1.18	0.00	45.75
24.16	1.18	0.00	45.25
24.18	1.18	0.00	44.00
24.20	1.17	0.00	42.75
24.22	1.17	0.00	42.75
24.24	1.17	0.00	43.25
24.26	1.17	0.00	43.25
24.28	1.18	0.00	44.00
24.30	1.18	0.00	44.50
24.32	1.18	0.00	45.25
24.34	1.18	0.00	44.50
24.36	1.18	0.00	44.50
24.38	1.18	0.00	44.00
24.40	1.17	0.00	43.25
24.42	1.17	0.00	42.75
24.44	1.17	0.00	42.75
24.46	1.17	0.00	43.25
24.48	1.18	0.00	44.00
24.50	1.18	0.00	44.50
24.52	1.18	0.00	45.25
24.54	1.18	0.00	45.25
24.56	1.18	0.00	45.25
24.58	1.18	0.00	45.25
24.60	1.18	0.00	44.00
24.62	1.17	0.00	43.25
24.64	1.17	0.00	42.75
24.66	1.17	0.00	42.00
24.68	1.17	0.00	42.75
24.70	1.18	0.00	44.00
24.72	1.18	0.00	44.50
24.74	1.18	0.00	45.25
24.76	1.18	0.00	45.75
24.78	1.18	0.00	45.75
24.80	1.19	0.00	46.50
24.82	1.19	0.00	46.50
24.84	1.18	0.00	45.75
24.86	1.18	0.00	45.75
24.88	1.19	0.00	46.50
24.90	1.19	0.00	46.50
24.92	1.19	0.00	47.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E105

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.94	1.19	0.00	47.00
24.96	1.19	0.00	47.50
24.98	1.19	0.00	47.50
25.00	1.19	0.00	47.50
25.02	1.19	0.00	46.50
25.04	1.18	0.00	45.25
25.06	1.17	0.00	43.25
25.08	1.17	0.00	43.25
25.10	1.17	0.00	43.25
25.12	1.18	0.00	44.00
25.14	1.18	0.00	44.00
25.16	1.18	0.00	44.50
25.18	1.18	0.00	44.50
25.20	1.18	0.00	44.00
25.22	1.18	0.00	44.00
25.24	1.18	0.00	44.00
25.26	1.17	0.00	43.25
25.28	1.17	0.00	42.75
25.30	1.17	0.00	42.75
25.32	1.17	0.00	42.75
25.34	1.17	0.00	43.25
25.36	1.17	0.00	43.25
25.38	1.17	0.00	43.25
25.40	1.17	0.00	43.25
25.42	1.18	0.00	44.00
25.44	1.18	0.00	44.00
25.46	1.17	0.00	43.25
25.48	1.17	0.00	43.25
25.50	1.18	0.00	44.00
25.52	1.18	0.00	44.00
25.54	1.18	0.00	44.00
25.56	1.17	0.00	43.25
25.58	1.17	0.00	43.25
25.60	1.17	0.00	43.25
25.62	1.17	0.00	43.25
25.64	1.17	0.00	43.25
25.66	1.17	0.00	43.25
25.68	1.17	0.00	42.75
25.70	1.17	0.00	42.75
25.72	1.17	0.00	42.75
25.74	1.17	0.00	42.75
25.76	1.17	0.00	42.00
25.78	1.17	0.00	42.75
25.80	1.17	0.00	42.75
25.82	1.17	0.00	43.25
25.84	1.17	0.00	43.25
25.86	1.17	0.00	43.25
25.88	1.18	0.00	44.00
25.90	1.17	0.00	43.25
25.92	1.17	0.00	42.00
25.94	1.17	0.00	41.50
25.96	1.16	0.00	41.00

Altran Report
96227-TR-01 Rev. 3
Att/Apx. E Sh E106

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
25.98	1.17	0.00	42.75
26.00	1.18	0.00	45.25
26.02	1.18	0.00	45.75
26.04	1.18	0.00	45.25
26.06	1.16	0.00	44.00
26.08	1.17	0.00	42.75
26.10	1.17	0.00	42.75
26.12	1.17	0.00	42.75
26.14	1.17	0.00	42.75
26.16	1.17	0.00	42.00
26.18	1.17	0.00	42.00
26.20	1.16	0.00	41.00
26.22	1.17	0.00	41.50
26.24	1.17	0.00	42.00
26.26	1.17	0.00	42.75
26.28	1.17	0.00	43.25
26.30	1.18	0.00	44.00
26.32	1.17	0.00	43.25
26.34	1.17	0.00	42.75
26.36	1.17	0.00	41.50
26.38	1.17	0.00	41.50
26.40	1.17	0.00	42.00
26.42	1.17	0.00	42.00
26.44	1.17	0.00	42.75
26.46	1.17	0.00	43.25
26.48	1.17	0.00	42.00
26.50	1.17	0.00	42.00
26.52	1.17	0.00	42.00
26.54	1.17	0.00	42.00
26.56	1.17	0.00	42.00
26.58	1.17	0.00	43.25
26.60	1.18	0.00	44.00
26.62	1.18	0.00	44.50
26.64	1.18	0.00	44.50
26.66	1.18	0.00	44.00
26.68	1.17	0.00	43.25
26.70	1.17	0.00	43.25
26.72	1.17	0.00	42.75
26.74	1.17	0.00	42.75
26.76	1.17	0.00	43.25
26.78	1.17	0.00	43.25
26.80	1.17	0.00	43.25
26.82	1.17	0.00	43.25
26.84	1.17	0.00	43.25
26.86	1.17	0.00	43.25
26.88	1.17	0.00	43.25
26.90	1.17	0.00	43.25
26.92	1.17	0.00	43.25
26.94	1.17	0.00	43.25
26.96	1.17	0.00	43.25
26.98	1.17	0.00	42.75
27.00	1.17	0.00	42.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E107

Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 28 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.02	1.17	0.00	42.75
27.04	1.17	0.00	43.25
27.06	1.17	0.00	43.25
27.08	1.17	0.00	43.25
27.10	1.17	0.00	43.25
27.12	1.17	0.00	43.25
27.14	1.17	0.00	42.00
27.16	1.17	0.00	42.75
27.18	1.17	0.00	43.25
27.20	1.18	0.00	44.00
27.22	1.18	0.00	44.00
27.24	1.18	0.00	44.50
27.26	1.18	0.00	44.50
27.28	1.18	0.00	45.25
27.30	1.18	0.00	45.75
27.32	1.18	0.00	45.75
27.34	1.18	0.00	45.25
27.36	1.18	0.00	44.50
27.38	1.17	0.00	43.25
27.40	1.17	0.00	42.75
27.42	1.17	0.00	42.75
27.44	1.17	0.00	42.00
27.46	1.16	0.00	41.00
27.48	1.16	0.00	40.25
27.50	1.16	0.00	41.00
27.52	1.17	0.00	41.50
27.54	1.17	0.00	42.00
27.56	1.17	0.00	42.00
27.58	1.17	0.00	41.50
27.60	1.17	0.00	41.50
27.62	1.17	0.00	41.50
27.64	1.16	0.00	41.00
27.66	1.16	0.00	41.00
27.68	1.16	0.00	41.00
27.70	1.16	0.00	41.00
27.72	1.17	0.00	42.00
27.74	1.17	0.00	42.75
27.76	1.17	0.00	43.25
27.78	1.17	0.00	42.75
27.80	1.17	0.00	42.00
27.82	1.17	0.00	41.50
27.84	1.17	0.00	41.50
27.86	1.17	0.00	42.00
27.88	1.17	0.00	43.25
27.90	1.18	0.00	44.00
27.92	1.17	0.00	43.25
27.94	1.17	0.00	42.00
27.96	1.17	0.00	41.50
27.98	1.16	0.00	41.00
28.00	1.17	0.00	41.50
28.02	1.17	0.00	42.00
28.04	1.17	0.00	41.50

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh E108

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
28.06	1.17	0.00	42.00
28.08	1.17	0.00	41.50
28.10	1.17	0.00	42.00
28.12	1.17	0.00	43.25
28.14	1.18	0.00	44.00
28.16	1.18	0.00	44.50
28.18	1.18	0.00	44.50
28.20	1.18	0.00	44.00
28.22	1.17	0.00	43.25
28.24	1.17	0.00	42.75
28.26	1.17	0.00	42.75
28.28	1.17	0.00	43.25
28.30	1.18	0.00	44.00
28.32	1.17	0.00	43.25
28.34	1.18	0.00	44.00
28.36	1.17	0.00	43.25
28.38	1.17	0.00	43.25
28.40	1.17	0.00	42.75
28.42	1.17	0.00	42.75
28.44	1.17	0.00	42.75
28.46	1.17	0.00	42.75
28.48	1.17	0.00	43.25
28.50	1.17	0.00	43.25
28.52	1.17	0.00	43.25
28.54	1.17	0.00	43.25
28.56	1.17	0.00	42.75
28.58	1.17	0.00	42.00
28.60	1.17	0.00	42.00
28.62	1.17	0.00	42.75
28.64	1.17	0.00	42.75
28.66	1.17	0.00	43.25
28.68	1.17	0.00	43.25
28.70	1.17	0.00	43.25
28.72	1.17	0.00	42.75
28.74	1.17	0.00	42.00
28.76	1.17	0.00	42.00
28.78	1.17	0.00	42.00
28.80	1.17	0.00	43.25
28.82	1.18	0.00	45.25
28.84	1.19	0.00	46.50
28.86	1.19	0.00	46.50
28.88	1.19	0.00	46.50
28.90	1.19	0.00	46.50
28.92	1.19	0.00	46.50
28.94	1.19	0.00	47.00
28.96	1.19	0.00	47.50
28.98	1.20	0.00	48.75
29.00	1.20	0.00	49.50
29.02	1.20	0.00	50.75
29.04	1.19	0.00	48.25
29.06	1.18	0.00	45.75
29.08	1.17	0.00	43.25

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh. E109

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.10	1.17	0.00	42.75
29.12	1.18	0.00	44.00
29.14	1.18	0.00	44.50
29.16	1.18	0.00	45.25
29.18	1.18	0.00	45.25
29.20	1.18	0.00	45.25
29.22	1.18	0.00	45.25
29.24	1.18	0.00	44.50
29.26	1.18	0.00	44.50
29.28	1.18	0.00	44.50
29.30	1.18	0.00	45.25
29.32	1.19	0.00	46.50
29.34	1.19	0.00	46.50
29.36	1.19	0.00	46.50
29.38	1.19	0.00	46.50
29.40	1.18	0.00	45.75
29.42	1.18	0.00	45.75
29.44	1.18	0.00	45.25
29.46	1.18	0.00	45.25
29.48	1.18	0.00	45.25
29.50	1.18	0.00	45.25
29.52	1.18	0.00	45.25
29.54	1.18	0.00	44.00
29.56	1.18	0.00	44.00
29.58	1.18	0.00	44.00
29.60	1.18	0.00	44.50
29.62	1.18	0.00	44.50
29.64	1.18	0.00	44.50
29.66	1.18	0.00	44.00
29.68	1.17	0.00	43.25
29.70	1.17	0.00	43.25
29.72	1.18	0.00	44.00
29.74	1.18	0.00	44.00
29.76	1.18	0.00	44.00
29.78	1.17	0.00	43.25
29.80	1.17	0.00	43.25
29.82	1.17	0.00	43.25
29.84	1.17	0.00	43.25
29.86	1.17	0.00	42.00
29.88	1.17	0.00	42.75
29.90	1.17	0.00	42.75
29.92	1.17	0.00	43.25
29.94	1.17	0.00	43.25
29.96	1.17	0.00	43.25
29.98	1.18	0.00	44.50
30.00	1.18	0.00	45.25

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E110

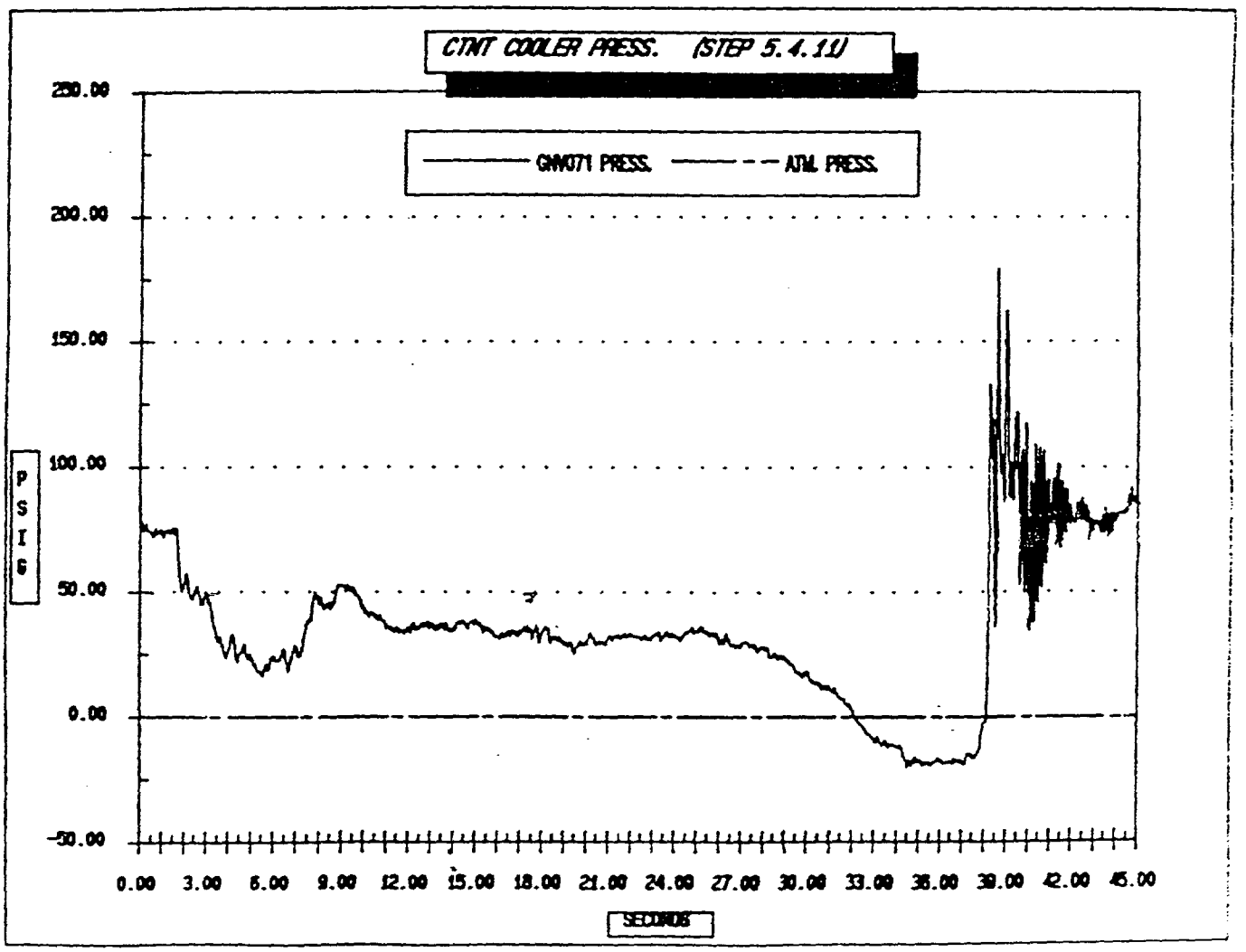
Attachment 5 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 31 of 31

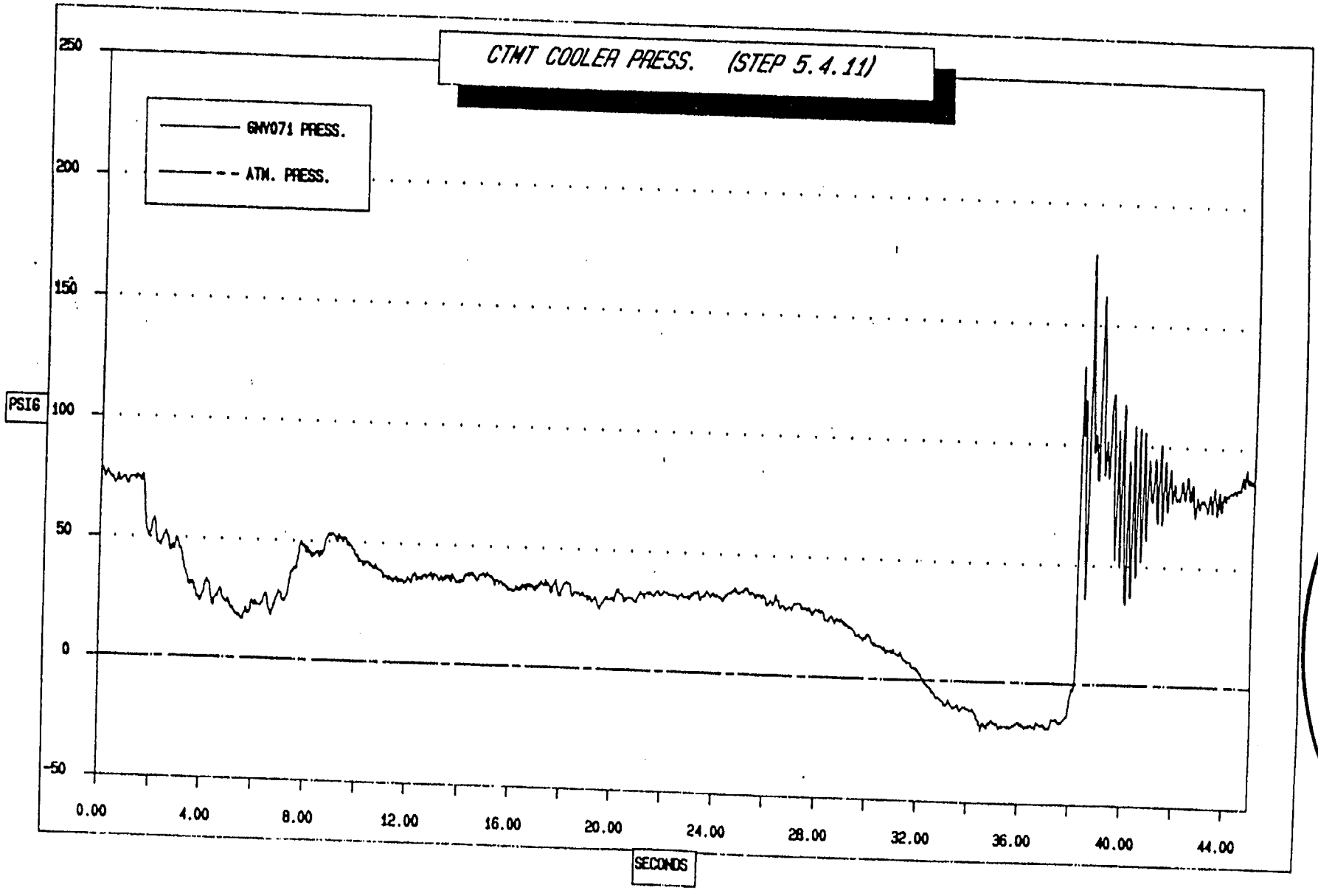
Data collected during step 5.4.11 loss of offsite power without SI. Data shows ESW pump shutdown during load shed and restarted by the Shutdown Sequencer. Service water is cross connected to maintain system fill and

Test: STS KJ-001B STEP 5.4.11	
Run:	0
Device:	MB16
Channel:	1
Event:	1
First Sample:	10024
Last Sample:	12274
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	200.5
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5
Y-Axis Lower Limit:	-5
Y-Axis Max Value:	1.718
Y-Axis Min Value:	0.9194
Y-Axis Units:	VOLTS

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh. E-111

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: [illegible] Date: 5-4-92
Verified By: TD Date: 5/7/92
Sheet 1 of 46





Altran Report
96237-NR-01 Rev. 3
Att/Appx. E Sh. E1/2

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.31	0.00	78.25
0.02	1.31	0.00	78.25
0.04	1.31	0.00	78.25
0.06	1.31	0.00	77.50
0.08	1.31	0.00	77.00
0.10	1.31	0.00	76.25
0.12	1.30	0.00	75.00
0.14	1.30	0.00	74.50
0.16	1.30	0.00	75.00
0.18	1.30	0.00	75.75
0.20	1.31	0.00	76.25
0.22	1.31	0.00	77.00
0.24	1.31	0.00	77.00
0.26	1.31	0.00	77.50
0.28	1.31	0.00	76.25
0.30	1.30	0.00	75.75
0.32	1.30	0.00	75.00
0.34	1.30	0.00	74.50
0.36	1.30	0.00	74.50
0.38	1.30	0.00	74.50
0.40	1.30	0.00	74.50
0.42	1.30	0.00	74.50
0.44	1.30	0.00	73.75
0.46	1.30	0.00	74.50
0.48	1.30	0.00	73.75
0.50	1.29	0.00	73.25
0.52	1.29	0.00	72.75
0.54	1.29	0.00	72.00
0.56	1.29	0.00	72.00
0.58	1.29	0.00	72.75
0.60	1.29	0.00	72.75
0.62	1.29	0.00	72.75
0.64	1.30	0.00	74.50
0.66	1.30	0.00	75.75
0.68	1.30	0.00	75.75
0.70	1.30	0.00	74.50
0.72	1.29	0.00	73.25
0.74	1.29	0.00	73.25
0.76	1.29	0.00	73.25
0.78	1.29	0.00	73.25
0.80	1.30	0.00	73.75
0.82	1.30	0.00	73.75
0.84	1.30	0.00	73.75
0.86	1.30	0.00	74.50
0.88	1.30	0.00	75.00
0.90	1.30	0.00	75.00
0.92	1.30	0.00	74.50
0.94	1.30	0.00	74.50
0.96	1.30	0.00	75.00
0.98	1.30	0.00	73.75
1.00	1.29	0.00	72.75
1.02	1.29	0.00	72.00

Altran Report
96227-TR.01 Rev. 3
Alt/Appx. E Sh E113

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
1.04	1.29	0.00	72.00
1.06	1.29	0.00	72.00
1.08	1.29	0.00	72.00
1.10	1.29	0.00	73.25
1.12	1.30	0.00	73.75
1.14	1.30	0.00	75.00
1.16	1.30	0.00	75.00
1.18	1.30	0.00	74.50
1.20	1.30	0.00	75.00
1.22	1.30	0.00	74.50
1.24	1.30	0.00	74.50
1.26	1.30	0.00	75.00
1.28	1.30	0.00	75.00
1.30	1.30	0.00	75.00
1.32	1.30	0.00	75.00
1.34	1.30	0.00	73.75
1.36	1.30	0.00	73.75
1.38	1.30	0.00	75.00
1.40	1.30	0.00	75.75
1.42	1.30	0.00	75.75
1.44	1.30	0.00	75.00
1.46	1.30	0.00	74.50
1.48	1.30	0.00	75.00
1.50	1.30	0.00	75.00
1.52	1.30	0.00	73.75
1.54	1.29	0.00	73.25
1.56	1.30	0.00	73.75
1.58	1.30	0.00	75.00
1.60	1.30	0.00	75.75
1.62	1.30	0.00	75.75
1.64	1.30	0.00	74.50
1.66	1.29	0.00	73.25
1.68	1.28	0.00	70.75
1.70	1.27	0.00	66.50
1.72	1.25	0.00	63.00
1.74	1.24	0.00	59.75
1.76	1.23	0.00	58.00
1.78	1.22	0.00	55.50
1.80	1.22	0.00	53.75
1.82	1.21	0.00	52.50
1.84	1.21	0.00	52.00
1.86	1.21	0.00	51.25
1.88	1.20	0.00	50.75
1.90	1.20	0.00	50.00
1.92	1.21	0.00	51.25
1.94	1.21	0.00	51.25
1.96	1.21	0.00	52.00
1.98	1.21	0.00	53.00
2.00	1.22	0.00	54.25
2.02	1.22	0.00	55.00
2.04	1.23	0.00	56.75
2.06	1.23	0.00	56.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E119

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.23	0.00	57.50
2.10	1.23	0.00	58.00
2.12	1.23	0.00	57.50
2.14	1.23	0.00	56.75
2.16	1.22	0.00	54.25
2.18	1.21	0.00	52.50
2.20	1.21	0.00	51.25
2.22	1.20	0.00	49.50
2.24	1.20	0.00	48.75
2.26	1.19	0.00	47.50
2.28	1.19	0.00	47.50
2.30	1.19	0.00	47.50
2.32	1.19	0.00	47.50
2.34	1.19	0.00	47.00
2.36	1.19	0.00	46.50
2.38	1.19	0.00	46.50
2.40	1.19	0.00	47.50
2.42	1.19	0.00	48.25
2.44	1.20	0.00	48.75
2.46	1.20	0.00	49.50
2.48	1.20	0.00	50.75
2.50	1.20	0.00	50.75
2.52	1.21	0.00	51.25
2.54	1.21	0.00	52.00
2.56	1.21	0.00	52.50
2.58	1.21	0.00	52.50
2.60	1.21	0.00	51.25
2.62	1.20	0.00	50.75
2.64	1.20	0.00	50.00
2.66	1.20	0.00	49.50
2.68	1.19	0.00	48.25
2.70	1.19	0.00	46.50
2.72	1.18	0.00	45.25
2.74	1.18	0.00	44.50
2.76	1.18	0.00	45.25
2.78	1.18	0.00	45.75
2.80	1.19	0.00	46.50
2.82	1.19	0.00	47.00
2.84	1.19	0.00	46.50
2.86	1.18	0.00	45.75
2.88	1.18	0.00	45.25
2.90	1.19	0.00	47.00
2.92	1.19	0.00	48.25
2.94	1.20	0.00	49.50
2.96	1.20	0.00	50.00
2.98	1.20	0.00	48.75
3.00	1.20	0.00	48.75
3.02	1.20	0.00	49.50
3.04	1.19	0.00	48.25
3.06	1.19	0.00	47.00
3.08	1.18	0.00	45.75
3.10	1.18	0.00	45.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E115

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
3.12	1.18	0.00	45.75
3.14	1.18	0.00	45.75
3.16	1.18	0.00	45.25
3.18	1.18	0.00	44.00
3.20	1.17	0.00	42.75
3.22	1.16	0.00	41.00
3.24	1.16	0.00	39.75
3.26	1.16	0.00	40.25
3.28	1.15	0.00	38.50
3.30	1.15	0.00	37.75
3.32	1.15	0.00	36.75
3.34	1.14	0.00	36.00
3.36	1.14	0.00	35.50
3.38	1.14	0.00	34.75
3.40	1.14	0.00	34.25
3.42	1.13	0.00	33.50
3.44	1.13	0.00	31.75
3.46	1.13	0.00	31.75
3.48	1.12	0.00	30.50
3.50	1.12	0.00	30.00
3.52	1.12	0.00	30.50
3.54	1.13	0.00	31.75
3.56	1.13	0.00	31.75
3.58	1.13	0.00	31.75
3.60	1.12	0.00	30.50
3.62	1.13	0.00	31.75
3.64	1.13	0.00	31.75
3.66	1.13	0.00	31.25
3.68	1.12	0.00	30.00
3.70	1.12	0.00	28.75
3.72	1.11	0.00	28.00
3.74	1.12	0.00	28.75
3.76	1.11	0.00	27.50
3.78	1.11	0.00	26.25
3.80	1.10	0.00	25.00
3.82	1.10	0.00	25.00
3.84	1.10	0.00	25.75
3.86	1.10	0.00	25.00
3.88	1.10	0.00	24.50
3.90	1.10	0.00	23.75
3.92	1.10	0.00	23.75
3.94	1.10	0.00	23.75
3.96	1.10	0.00	24.50
3.98	1.11	0.00	26.25
4.00	1.11	0.00	26.25
4.02	1.11	0.00	26.75
4.04	1.11	0.00	27.50
4.06	1.11	0.00	28.00
4.08	1.12	0.00	30.00
4.10	1.12	0.00	30.50
4.12	1.13	0.00	31.75
4.14	1.13	0.00	33.00

Altran Report
91227-TR-01 Rev. 3
Att/Appx. E Sh E116

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.13	0.00	32.25
4.18	1.13	0.00	33.00
4.20	1.13	0.00	31.75
4.22	1.13	0.00	31.25
4.24	1.13	0.00	31.75
4.26	1.13	0.00	31.25
4.28	1.12	0.00	30.00
4.30	1.12	0.00	28.75
4.32	1.11	0.00	26.75
4.34	1.10	0.00	25.00
4.36	1.10	0.00	24.50
4.38	1.09	0.00	22.50
4.40	1.09	0.00	22.50
4.42	1.09	0.00	22.00
4.44	1.09	0.00	23.25
4.46	1.10	0.00	24.50
4.48	1.10	0.00	25.00
4.50	1.10	0.00	25.00
4.52	1.10	0.00	25.75
4.54	1.11	0.00	26.25
4.56	1.11	0.00	26.25
4.58	1.10	0.00	25.75
4.60	1.11	0.00	26.25
4.62	1.11	0.00	27.50
4.64	1.11	0.00	28.00
4.66	1.12	0.00	28.75
4.68	1.12	0.00	29.25
4.70	1.12	0.00	29.25
4.72	1.12	0.00	28.75
4.74	1.11	0.00	27.50
4.76	1.11	0.00	26.25
4.78	1.10	0.00	25.75
4.80	1.10	0.00	25.00
4.82	1.10	0.00	24.50
4.84	1.10	0.00	24.50
4.86	1.10	0.00	24.50
4.88	1.09	0.00	23.25
4.90	1.10	0.00	23.75
4.92	1.09	0.00	23.25
4.94	1.09	0.00	23.25
4.96	1.10	0.00	23.75
4.98	1.10	0.00	25.00
5.00	1.10	0.00	25.00
5.02	1.10	0.00	24.50
5.04	1.09	0.00	23.25
5.06	1.09	0.00	22.50
5.08	1.09	0.00	23.25
5.10	1.09	0.00	21.25
5.12	1.08	0.00	20.75
5.14	1.08	0.00	20.75
5.16	1.09	0.00	21.25
5.18	1.09	0.00	21.25

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh E17

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
5.20	1.08	0.00	20.75
5.22	1.08	0.00	20.25
5.24	1.08	0.00	19.50
5.26	1.08	0.00	19.50
5.28	1.08	0.00	19.00
5.30	1.07	0.00	18.25
5.32	1.07	0.00	18.25
5.34	1.07	0.00	18.25
5.36	1.07	0.00	18.25
5.38	1.07	0.00	17.75
5.40	1.07	0.00	17.75
5.42	1.07	0.00	18.25
5.44	1.07	0.00	18.25
5.46	1.07	0.00	18.25
5.48	1.07	0.00	17.00
5.50	1.07	0.00	17.00
5.52	1.07	0.00	16.50
5.54	1.07	0.00	16.50
5.56	1.07	0.00	16.50
5.58	1.07	0.00	16.50
5.60	1.07	0.00	17.75
5.62	1.08	0.00	19.00
5.64	1.08	0.00	19.00
5.66	1.08	0.00	20.25
5.68	1.09	0.00	21.25
5.70	1.09	0.00	21.25
5.72	1.08	0.00	20.25
5.74	1.08	0.00	19.00
5.76	1.08	0.00	19.00
5.78	1.08	0.00	19.50
5.80	1.08	0.00	19.00
5.82	1.08	0.00	19.00
5.84	1.08	0.00	19.50
5.86	1.08	0.00	20.75
5.88	1.09	0.00	23.25
5.90	1.10	0.00	23.75
5.92	1.10	0.00	24.50
5.94	1.09	0.00	23.25
5.96	1.09	0.00	23.25
5.98	1.10	0.00	23.75
6.00	1.09	0.00	22.50
6.02	1.09	0.00	22.50
6.04	1.10	0.00	23.75
6.06	1.10	0.00	24.50
6.08	1.09	0.00	23.25
6.10	1.09	0.00	23.25
6.12	1.09	0.00	22.50
6.14	1.09	0.00	22.50
6.16	1.09	0.00	22.50
6.18	1.09	0.00	22.50
6.20	1.09	0.00	22.50
6.22	1.09	0.00	22.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E118

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.09	0.00	22.50
6.26	1.09	0.00	22.50
6.28	1.09	0.00	22.50
6.30	1.09	0.00	23.25
6.32	1.09	0.00	23.25
6.34	1.10	0.00	23.75
6.36	1.10	0.00	24.50
6.38	1.10	0.00	25.75
6.40	1.11	0.00	26.25
6.42	1.11	0.00	27.50
6.44	1.11	0.00	27.50
6.46	1.11	0.00	27.50
6.48	1.11	0.00	27.50
6.50	1.11	0.00	26.25
6.52	1.10	0.00	25.00
6.54	1.10	0.00	23.75
6.56	1.09	0.00	22.00
6.58	1.09	0.00	21.25
6.60	1.08	0.00	20.75
6.62	1.08	0.00	20.25
6.64	1.08	0.00	19.50
6.66	1.07	0.00	18.25
6.68	1.07	0.00	18.25
6.70	1.08	0.00	19.50
6.72	1.08	0.00	20.75
6.74	1.09	0.00	21.25
6.76	1.09	0.00	22.00
6.78	1.09	0.00	23.25
6.80	1.09	0.00	22.50
6.82	1.09	0.00	23.25
6.84	1.10	0.00	24.50
6.86	1.10	0.00	25.75
6.88	1.11	0.00	26.25
6.90	1.11	0.00	26.75
6.92	1.11	0.00	26.75
6.94	1.12	0.00	28.75
6.96	1.11	0.00	28.00
6.98	1.11	0.00	28.00
7.00	1.11	0.00	28.00
7.02	1.11	0.00	28.00
7.04	1.11	0.00	27.50
7.06	1.11	0.00	26.25
7.08	1.10	0.00	25.00
7.10	1.10	0.00	24.50
7.12	1.10	0.00	24.50
7.14	1.10	0.00	24.50
7.16	1.10	0.00	24.50
7.18	1.10	0.00	24.50
7.20	1.10	0.00	25.00
7.22	1.10	0.00	25.75
7.24	1.11	0.00	26.25
7.26	1.11	0.00	26.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E119

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
7.28	1.11	0.00	26.75
7.30	1.12	0.00	28.75
7.32	1.12	0.00	30.50
7.34	1.13	0.00	32.25
7.36	1.13	0.00	33.50
7.38	1.13	0.00	33.50
7.40	1.14	0.00	35.50
7.42	1.15	0.00	36.75
7.44	1.15	0.00	36.75
7.46	1.15	0.00	36.75
7.48	1.15	0.00	36.75
7.50	1.15	0.00	37.75
7.52	1.15	0.00	38.50
7.54	1.15	0.00	37.75
7.56	1.16	0.00	39.00
7.58	1.16	0.00	39.00
7.60	1.16	0.00	39.00
7.62	1.15	0.00	38.50
7.64	1.16	0.00	39.00
7.66	1.16	0.00	41.00
7.68	1.17	0.00	42.00
7.70	1.18	0.00	44.00
7.72	1.18	0.00	45.25
7.74	1.18	0.00	45.75
7.76	1.19	0.00	48.25
7.78	1.20	0.00	48.75
7.80	1.20	0.00	48.75
7.82	1.20	0.00	50.00
7.84	1.20	0.00	49.50
7.86	1.20	0.00	48.75
7.88	1.19	0.00	48.25
7.90	1.19	0.00	47.50
7.92	1.19	0.00	47.50
7.94	1.19	0.00	48.25
7.96	1.19	0.00	48.25
7.98	1.19	0.00	47.50
8.00	1.18	0.00	45.25
8.02	1.18	0.00	45.25
8.04	1.19	0.00	47.00
8.06	1.19	0.00	47.50
8.08	1.19	0.00	47.00
8.10	1.18	0.00	45.25
8.12	1.18	0.00	45.75
8.14	1.18	0.00	45.75
8.16	1.18	0.00	44.50
8.18	1.18	0.00	45.25
8.20	1.18	0.00	44.00
8.22	1.17	0.00	43.25
8.24	1.17	0.00	43.25
8.26	1.18	0.00	44.00
8.28	1.18	0.00	44.50
8.30	1.18	0.00	44.00

Altran Report
96227-TR-01 Rev. 3
Att/Apx. E Sh E120

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.18	0.00	44.50
8.34	1.18	0.00	44.00
8.36	1.18	0.00	45.25
8.38	1.18	0.00	45.25
8.40	1.18	0.00	45.25
8.42	1.18	0.00	45.75
8.44	1.18	0.00	45.75
8.46	1.18	0.00	45.25
8.48	1.18	0.00	45.75
8.50	1.18	0.00	44.00
8.52	1.17	0.00	43.25
8.54	1.18	0.00	44.00
8.56	1.18	0.00	45.75
8.58	1.18	0.00	45.75
8.60	1.18	0.00	45.75
8.62	1.18	0.00	44.50
8.64	1.18	0.00	45.25
8.66	1.18	0.00	45.75
8.68	1.18	0.00	45.75
8.70	1.19	0.00	46.50
8.72	1.19	0.00	47.50
8.74	1.20	0.00	48.75
8.76	1.20	0.00	50.75
8.78	1.21	0.00	51.25
8.80	1.21	0.00	51.25
8.82	1.21	0.00	51.25
8.84	1.21	0.00	52.50
8.86	1.21	0.00	53.00
8.88	1.21	0.00	52.50
8.90	1.21	0.00	53.00
8.92	1.21	0.00	52.50
8.94	1.21	0.00	52.50
8.96	1.21	0.00	53.00
8.98	1.21	0.00	52.50
9.00	1.21	0.00	53.00
9.02	1.21	0.00	53.00
9.04	1.21	0.00	53.00
9.06	1.21	0.00	53.00
9.08	1.21	0.00	53.00
9.10	1.21	0.00	52.50
9.12	1.21	0.00	52.50
9.14	1.21	0.00	52.00
9.16	1.21	0.00	52.00
9.18	1.20	0.00	50.75
9.20	1.21	0.00	51.25
9.22	1.20	0.00	50.00
9.24	1.20	0.00	50.75
9.26	1.21	0.00	52.00
9.28	1.21	0.00	53.00
9.30	1.21	0.00	52.50
9.32	1.21	0.00	52.00
9.34	1.21	0.00	51.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E121

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
9.36	1.21	0.00	52.00
9.38	1.21	0.00	52.00
9.40	1.21	0.00	51.25
9.42	1.20	0.00	50.75
9.44	1.20	0.00	50.00
9.46	1.21	0.00	51.25
9.48	1.21	0.00	52.00
9.50	1.21	0.00	51.25
9.52	1.21	0.00	52.00
9.54	1.21	0.00	51.25
9.56	1.21	0.00	51.25
9.58	1.20	0.00	50.75
9.60	1.20	0.00	48.75
9.62	1.20	0.00	48.75
9.64	1.20	0.00	48.75
9.66	1.20	0.00	48.75
9.68	1.20	0.00	49.50
9.70	1.20	0.00	48.75
9.72	1.19	0.00	48.25
9.74	1.19	0.00	48.25
9.76	1.19	0.00	48.25
9.78	1.19	0.00	47.50
9.80	1.19	0.00	47.00
9.82	1.19	0.00	47.00
9.84	1.19	0.00	46.50
9.86	1.19	0.00	46.50
9.88	1.18	0.00	45.75
9.90	1.18	0.00	44.50
9.92	1.18	0.00	44.00
9.94	1.18	0.00	44.00
9.96	1.18	0.00	44.00
9.98	1.18	0.00	44.50
10.00	1.18	0.00	44.50
10.02	1.18	0.00	44.00
10.04	1.17	0.00	42.00
10.06	1.17	0.00	42.75
10.08	1.17	0.00	42.75
10.10	1.17	0.00	42.75
10.12	1.17	0.00	42.00
10.14	1.17	0.00	41.50
10.16	1.17	0.00	41.50
10.18	1.17	0.00	42.00
10.20	1.17	0.00	42.00
10.22	1.17	0.00	41.50
10.24	1.16	0.00	40.25
10.26	1.16	0.00	40.25
10.28	1.17	0.00	41.50
10.30	1.16	0.00	41.00
10.32	1.16	0.00	41.00
10.34	1.17	0.00	41.50
10.36	1.17	0.00	42.00
10.38	1.17	0.00	42.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E12Z

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	1.17	0.00	41.50
10.42	1.17	0.00	41.50
10.44	1.17	0.00	41.50
10.46	1.17	0.00	41.50
10.48	1.16	0.00	41.00
10.50	1.16	0.00	40.25
10.52	1.16	0.00	41.00
10.54	1.16	0.00	41.00
10.56	1.16	0.00	40.25
10.58	1.16	0.00	39.75
10.60	1.16	0.00	39.75
10.62	1.16	0.00	39.00
10.64	1.16	0.00	39.75
10.66	1.16	0.00	39.00
10.68	1.16	0.00	39.75
10.70	1.16	0.00	40.25
10.72	1.16	0.00	41.00
10.74	1.16	0.00	40.25
10.76	1.16	0.00	39.00
10.78	1.16	0.00	39.00
10.80	1.16	0.00	39.00
10.82	1.16	0.00	39.00
10.84	1.15	0.00	38.50
10.86	1.15	0.00	38.50
10.88	1.15	0.00	38.50
10.90	1.15	0.00	38.50
10.92	1.15	0.00	38.50
10.94	1.15	0.00	38.50
10.96	1.15	0.00	37.75
10.98	1.15	0.00	37.25
11.00	1.15	0.00	37.25
11.02	1.14	0.00	35.50
11.04	1.14	0.00	36.00
11.06	1.14	0.00	36.00
11.08	1.14	0.00	36.00
11.10	1.14	0.00	36.00
11.12	1.14	0.00	36.00
11.14	1.14	0.00	36.00
11.16	1.14	0.00	36.00
11.18	1.14	0.00	35.50
11.20	1.14	0.00	34.75
11.22	1.14	0.00	34.75
11.24	1.14	0.00	36.00
11.26	1.14	0.00	36.00
11.28	1.14	0.00	35.50
11.30	1.14	0.00	35.50
11.32	1.14	0.00	34.75
11.34	1.14	0.00	34.75
11.36	1.14	0.00	34.25
11.38	1.13	0.00	33.50
11.40	1.14	0.00	34.25
11.42	1.14	0.00	34.75

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E123

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 13 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
11.44	1.14	0.00	35.50
11.46	1.14	0.00	35.50
11.48	1.14	0.00	35.50
11.50	1.14	0.00	34.75
11.52	1.14	0.00	36.00
11.54	1.14	0.00	35.50
11.56	1.14	0.00	34.75
11.58	1.13	0.00	33.50
11.60	1.14	0.00	34.25
11.62	1.14	0.00	34.75
11.64	1.14	0.00	34.75
11.66	1.14	0.00	34.25
11.68	1.14	0.00	34.25
11.70	1.14	0.00	34.75
11.72	1.14	0.00	34.75
11.74	1.14	0.00	34.25
11.76	1.14	0.00	34.75
11.78	1.14	0.00	34.25
11.80	1.14	0.00	34.25
11.82	1.13	0.00	33.50
11.84	1.13	0.00	33.00
11.86	1.13	0.00	33.50
11.88	1.13	0.00	33.50
11.90	1.14	0.00	34.25
11.92	1.14	0.00	34.25
11.94	1.14	0.00	34.75
11.96	1.14	0.00	36.00
11.98	1.14	0.00	35.50
12.00	1.14	0.00	35.50
12.02	1.14	0.00	34.75
12.04	1.14	0.00	34.75
12.06	1.14	0.00	34.75
12.08	1.14	0.00	34.25
12.10	1.13	0.00	33.50
12.12	1.14	0.00	34.75
12.14	1.14	0.00	36.00
12.16	1.15	0.00	36.75
12.18	1.15	0.00	37.25
12.20	1.15	0.00	36.75
12.22	1.15	0.00	37.25
12.24	1.15	0.00	37.75
12.26	1.15	0.00	37.75
12.28	1.15	0.00	36.75
12.30	1.14	0.00	35.50
12.32	1.14	0.00	34.75
12.34	1.14	0.00	35.50
12.36	1.14	0.00	36.00
12.38	1.14	0.00	36.00
12.40	1.14	0.00	35.50
12.42	1.14	0.00	36.00
12.44	1.14	0.00	36.00
12.46	1.14	0.00	35.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E129

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	1.14	0.00	36.00
12.50	1.14	0.00	35.50
12.52	1.14	0.00	36.00
12.54	1.15	0.00	36.75
12.56	1.15	0.00	36.75
12.58	1.15	0.00	37.25
12.60	1.15	0.00	36.75
12.62	1.15	0.00	37.25
12.64	1.15	0.00	37.25
12.66	1.14	0.00	36.00
12.68	1.14	0.00	36.00
12.70	1.14	0.00	36.00
12.72	1.15	0.00	36.75
12.74	1.15	0.00	37.25
12.76	1.15	0.00	37.25
12.78	1.15	0.00	36.75
12.80	1.15	0.00	36.75
12.82	1.15	0.00	36.75
12.84	1.15	0.00	37.75
12.86	1.15	0.00	38.50
12.88	1.15	0.00	37.75
12.90	1.15	0.00	37.25
12.92	1.14	0.00	35.50
12.94	1.14	0.00	35.50
12.96	1.15	0.00	36.75
12.98	1.15	0.00	37.75
13.00	1.15	0.00	37.75
13.02	1.15	0.00	37.25
13.04	1.15	0.00	37.25
13.06	1.15	0.00	36.75
13.08	1.15	0.00	36.75
13.10	1.15	0.00	37.25
13.12	1.14	0.00	36.00
13.14	1.14	0.00	36.00
13.16	1.14	0.00	35.50
13.18	1.14	0.00	34.75
13.20	1.14	0.00	35.50
13.22	1.14	0.00	35.50
13.24	1.14	0.00	36.00
13.26	1.15	0.00	36.75
13.28	1.14	0.00	36.00
13.30	1.14	0.00	36.00
13.32	1.14	0.00	34.75
13.34	1.14	0.00	35.50
13.36	1.14	0.00	35.50
13.38	1.14	0.00	35.50
13.40	1.15	0.00	36.75
13.42	1.14	0.00	35.50
13.44	1.15	0.00	36.75
13.46	1.15	0.00	37.25
13.48	1.15	0.00	37.25
13.50	1.15	0.00	37.25

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E125

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
13.52	1.14	0.00	36.00
13.54	1.14	0.00	36.00
13.56	1.15	0.00	36.75
13.58	1.15	0.00	36.75
13.60	1.14	0.00	35.50
13.62	1.14	0.00	34.75
13.64	1.14	0.00	34.75
13.66	1.15	0.00	36.75
13.68	1.15	0.00	37.75
13.70	1.15	0.00	37.25
13.72	1.15	0.00	36.75
13.74	1.14	0.00	36.00
13.76	1.14	0.00	36.00
13.78	1.14	0.00	36.00
13.80	1.14	0.00	34.75
13.82	1.14	0.00	34.25
13.84	1.14	0.00	34.25
13.86	1.14	0.00	34.75
13.88	1.14	0.00	34.75
13.90	1.14	0.00	34.25
13.92	1.14	0.00	34.75
13.94	1.14	0.00	34.25
13.96	1.14	0.00	35.50
13.98	1.14	0.00	34.75
14.00	1.14	0.00	34.25
14.02	1.14	0.00	34.75
14.04	1.14	0.00	34.75
14.06	1.14	0.00	35.50
14.08	1.14	0.00	34.75
14.10	1.14	0.00	34.75
14.12	1.14	0.00	35.50
14.14	1.14	0.00	36.00
14.16	1.15	0.00	37.25
14.18	1.15	0.00	37.75
14.20	1.15	0.00	37.25
14.22	1.15	0.00	37.75
14.24	1.15	0.00	37.25
14.26	1.15	0.00	37.75
14.28	1.15	0.00	38.50
14.30	1.15	0.00	37.75
14.32	1.15	0.00	37.75
14.34	1.15	0.00	37.25
14.36	1.15	0.00	37.25
14.38	1.15	0.00	38.50
14.40	1.15	0.00	38.50
14.42	1.15	0.00	38.50
14.44	1.15	0.00	37.75
14.46	1.15	0.00	37.75
14.48	1.15	0.00	38.50
14.50	1.15	0.00	38.50
14.52	1.15	0.00	37.75
14.54	1.15	0.00	37.25

Altran Report
96227-TR-01 Rev. 3
Att/Apx. E Sh E126

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	1.15	0.00	37.25
14.58	1.15	0.00	37.25
14.60	1.14	0.00	36.00
14.62	1.14	0.00	36.00
14.64	1.14	0.00	35.50
14.66	1.14	0.00	35.50
14.68	1.14	0.00	35.50
14.70	1.14	0.00	36.00
14.72	1.15	0.00	37.25
14.74	1.15	0.00	37.75
14.76	1.15	0.00	37.75
14.78	1.15	0.00	37.75
14.80	1.15	0.00	37.75
14.82	1.15	0.00	37.75
14.84	1.15	0.00	37.75
14.86	1.15	0.00	38.50
14.88	1.15	0.00	38.50
14.90	1.15	0.00	38.50
14.92	1.15	0.00	38.50
14.94	1.15	0.00	37.75
14.96	1.15	0.00	36.75
14.98	1.15	0.00	36.75
15.00	1.15	0.00	37.75
15.02	1.15	0.00	38.50
15.04	1.16	0.00	39.00
15.06	1.15	0.00	37.75
15.08	1.15	0.00	37.75
15.10	1.15	0.00	37.75
15.12	1.15	0.00	37.75
15.14	1.15	0.00	37.75
15.16	1.15	0.00	36.75
15.18	1.15	0.00	36.75
15.20	1.15	0.00	37.25
15.22	1.15	0.00	37.25
15.24	1.15	0.00	37.25
15.26	1.14	0.00	36.00
15.28	1.14	0.00	35.50
15.30	1.14	0.00	36.00
15.32	1.14	0.00	34.25
15.34	1.13	0.00	33.50
15.36	1.14	0.00	34.25
15.38	1.14	0.00	35.50
15.40	1.14	0.00	36.00
15.42	1.14	0.00	36.00
15.44	1.14	0.00	36.00
15.46	1.14	0.00	35.50
15.48	1.14	0.00	35.50
15.50	1.14	0.00	34.75
15.52	1.14	0.00	34.25
15.54	1.14	0.00	34.75
15.56	1.14	0.00	34.75
15.58	1.14	0.00	34.75

Altran Report
962277-TR-01 Rev. 3
Att/Appx. E Sh E127

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
15.60	1.14	0.00	35.50
15.62	1.14	0.00	34.75
15.64	1.14	0.00	34.75
15.66	1.14	0.00	34.75
15.68	1.13	0.00	33.50
15.70	1.14	0.00	34.25
15.72	1.14	0.00	34.25
15.74	1.14	0.00	34.25
15.76	1.13	0.00	33.50
15.78	1.13	0.00	33.00
15.80	1.13	0.00	33.00
15.82	1.13	0.00	33.50
15.84	1.13	0.00	33.00
15.86	1.13	0.00	33.00
15.88	1.13	0.00	31.75
15.90	1.13	0.00	31.75
15.92	1.13	0.00	32.25
15.94	1.13	0.00	32.25
15.96	1.13	0.00	32.25
15.98	1.13	0.00	31.75
16.00	1.13	0.00	31.75
16.02	1.13	0.00	32.25
16.04	1.13	0.00	31.75
16.06	1.13	0.00	31.75
16.08	1.13	0.00	31.25
16.10	1.13	0.00	31.25
16.12	1.13	0.00	31.25
16.14	1.13	0.00	31.75
16.16	1.13	0.00	32.25
16.18	1.13	0.00	32.25
16.20	1.13	0.00	33.50
16.22	1.13	0.00	33.00
16.24	1.13	0.00	32.25
16.26	1.13	0.00	33.00
16.28	1.13	0.00	32.25
16.30	1.13	0.00	31.75
16.32	1.13	0.00	31.75
16.34	1.13	0.00	32.25
16.36	1.13	0.00	33.00
16.38	1.13	0.00	33.00
16.40	1.13	0.00	32.25
16.42	1.13	0.00	33.50
16.44	1.14	0.00	34.25
16.46	1.14	0.00	34.25
16.48	1.13	0.00	33.50
16.50	1.13	0.00	33.00
16.52	1.13	0.00	33.50
16.54	1.14	0.00	34.25
16.56	1.14	0.00	34.25
16.58	1.13	0.00	33.50
16.60	1.13	0.00	32.25
16.62	1.13	0.00	33.50

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh E128

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	1.14	0.00	34.75
16.66	1.14	0.00	34.75
16.68	1.14	0.00	34.75
16.70	1.13	0.00	33.50
16.72	1.14	0.00	34.25
16.74	1.14	0.00	34.25
16.76	1.13	0.00	33.50
16.78	1.14	0.00	34.25
16.80	1.14	0.00	34.25
16.82	1.13	0.00	33.50
16.84	1.13	0.00	33.00
16.86	1.13	0.00	33.00
16.88	1.13	0.00	33.50
16.90	1.13	0.00	32.25
16.92	1.13	0.00	33.00
16.94	1.13	0.00	32.25
16.96	1.13	0.00	33.00
16.98	1.14	0.00	34.25
17.00	1.13	0.00	33.50
17.02	1.13	0.00	33.00
17.04	1.13	0.00	33.00
17.06	1.13	0.00	33.50
17.08	1.14	0.00	34.75
17.10	1.14	0.00	34.75
17.12	1.14	0.00	34.25
17.14	1.14	0.00	34.75
17.16	1.14	0.00	36.00
17.18	1.14	0.00	36.00
17.20	1.14	0.00	35.50
17.22	1.14	0.00	34.75
17.24	1.14	0.00	34.75
17.26	1.14	0.00	34.75
17.28	1.14	0.00	34.25
17.30	1.14	0.00	34.75
17.32	1.14	0.00	34.25
17.34	1.14	0.00	35.50
17.36	1.15	0.00	36.75
17.38	1.14	0.00	36.00
17.40	1.14	0.00	34.75
17.42	1.14	0.00	34.25
17.44	1.14	0.00	34.75
17.46	1.14	0.00	35.50
17.48	1.14	0.00	35.50
17.50	1.14	0.00	34.25
17.52	1.14	0.00	34.25
17.54	1.13	0.00	33.50
17.56	1.13	0.00	32.25
17.58	1.13	0.00	31.25
17.60	1.13	0.00	31.75
17.62	1.13	0.00	31.75
17.64	1.13	0.00	33.50
17.66	1.14	0.00	34.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E-129

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
17.68	1.14	0.00	34.75
17.70	1.14	0.00	35.50
17.72	1.14	0.00	35.50
17.74	1.14	0.00	36.00
17.76	1.15	0.00	36.75
17.78	1.14	0.00	34.25
17.80	1.14	0.00	34.25
17.82	1.13	0.00	33.00
17.84	1.13	0.00	31.75
17.86	1.12	0.00	30.50
17.88	1.12	0.00	30.00
17.90	1.12	0.00	30.00
17.92	1.12	0.00	30.00
17.94	1.12	0.00	30.50
17.96	1.13	0.00	32.25
17.98	1.13	0.00	33.00
18.00	1.13	0.00	33.00
18.02	1.14	0.00	34.25
18.04	1.14	0.00	34.75
18.06	1.14	0.00	34.75
18.08	1.14	0.00	35.50
18.10	1.14	0.00	35.50
18.12	1.14	0.00	35.50
18.14	1.14	0.00	36.00
18.16	1.14	0.00	35.50
18.18	1.14	0.00	36.00
18.20	1.14	0.00	35.50
18.22	1.14	0.00	35.50
18.24	1.14	0.00	35.50
18.26	1.14	0.00	35.50
18.28	1.14	0.00	35.50
18.30	1.14	0.00	34.75
18.32	1.13	0.00	33.50
18.34	1.13	0.00	32.25
18.36	1.13	0.00	31.25
18.38	1.12	0.00	30.50
18.40	1.12	0.00	30.00
18.42	1.12	0.00	30.00
18.44	1.12	0.00	30.50
18.46	1.13	0.00	31.25
18.48	1.13	0.00	31.75
18.50	1.13	0.00	31.75
18.52	1.13	0.00	31.75
18.54	1.13	0.00	32.25
18.56	1.13	0.00	31.75
18.58	1.13	0.00	31.25
18.60	1.13	0.00	31.25
18.62	1.13	0.00	31.25
18.64	1.13	0.00	31.75
18.66	1.13	0.00	31.75
18.68	1.13	0.00	31.25
18.70	1.13	0.00	31.25

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E130

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
18.72	1.12	0.00	30.50
18.74	1.12	0.00	30.50
18.76	1.13	0.00	31.25
18.78	1.13	0.00	31.25
18.80	1.13	0.00	31.75
18.82	1.13	0.00	31.75
18.84	1.13	0.00	31.25
18.86	1.12	0.00	30.50
18.88	1.12	0.00	30.50
18.90	1.12	0.00	30.00
18.92	1.12	0.00	30.00
18.94	1.12	0.00	30.00
18.96	1.12	0.00	30.00
18.98	1.12	0.00	30.50
19.00	1.12	0.00	30.00
19.02	1.12	0.00	28.75
19.04	1.12	0.00	28.75
19.06	1.12	0.00	30.00
19.08	1.12	0.00	30.00
19.10	1.12	0.00	30.00
19.12	1.12	0.00	30.00
19.14	1.12	0.00	29.25
19.16	1.11	0.00	28.00
19.18	1.11	0.00	28.00
19.20	1.11	0.00	28.00
19.22	1.12	0.00	28.75
19.24	1.12	0.00	28.75
19.26	1.12	0.00	29.25
19.28	1.12	0.00	29.25
19.30	1.12	0.00	30.00
19.32	1.12	0.00	30.00
19.34	1.12	0.00	29.25
19.36	1.12	0.00	28.75
19.38	1.11	0.00	27.50
19.40	1.11	0.00	26.75
19.42	1.11	0.00	26.25
19.44	1.10	0.00	25.75
19.46	1.10	0.00	25.75
19.48	1.10	0.00	25.00
19.50	1.11	0.00	26.25
19.52	1.11	0.00	26.25
19.54	1.11	0.00	27.50
19.56	1.11	0.00	27.50
19.58	1.11	0.00	27.50
19.60	1.11	0.00	28.00
19.62	1.11	0.00	28.00
19.64	1.12	0.00	28.75
19.66	1.12	0.00	29.25
19.68	1.12	0.00	29.25
19.70	1.12	0.00	29.25
19.72	1.12	0.00	30.00
19.74	1.12	0.00	30.50

Altran Report
9622.7-NR-01 Rev. 3
Att./Appx. E Sh. E131

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
19.76	1.12	0.00	30.50
19.78	1.12	0.00	30.50
19.80	1.12	0.00	29.25
19.82	1.12	0.00	29.25
19.84	1.12	0.00	29.25
19.86	1.12	0.00	29.25
19.88	1.12	0.00	29.25
19.90	1.12	0.00	29.25
19.92	1.12	0.00	29.25
19.94	1.12	0.00	30.00
19.96	1.12	0.00	30.00
19.98	1.12	0.00	30.00
20.00	1.12	0.00	29.25
20.02	1.12	0.00	29.25
20.04	1.12	0.00	28.75
20.06	1.12	0.00	29.25
20.08	1.12	0.00	30.50
20.10	1.13	0.00	31.25
20.12	1.13	0.00	32.25
20.14	1.13	0.00	33.00
20.16	1.13	0.00	33.50
20.18	1.13	0.00	33.50
20.20	1.13	0.00	33.50
20.22	1.13	0.00	33.50
20.24	1.13	0.00	32.25
20.26	1.13	0.00	32.25
20.28	1.13	0.00	31.75
20.30	1.13	0.00	31.75
20.32	1.13	0.00	31.75
20.34	1.13	0.00	31.75
20.36	1.13	0.00	31.75
20.38	1.13	0.00	31.25
20.40	1.13	0.00	31.25
20.42	1.12	0.00	30.00
20.44	1.12	0.00	29.25
20.46	1.12	0.00	28.75
20.48	1.12	0.00	29.25
20.50	1.12	0.00	30.00
20.52	1.12	0.00	29.25
20.54	1.12	0.00	29.25
20.56	1.12	0.00	30.00
20.58	1.12	0.00	30.00
20.60	1.12	0.00	30.00
20.62	1.12	0.00	30.00
20.64	1.12	0.00	30.50
20.66	1.12	0.00	30.50
20.68	1.12	0.00	30.00
20.70	1.12	0.00	30.00
20.72	1.12	0.00	30.00
20.74	1.12	0.00	30.00
20.76	1.12	0.00	30.00
20.78	1.12	0.00	30.00

Altran Report
96227-TR-01 Rev. 3
Att. Appx. E Sh E 132

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 22 of 42

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	1.12	0.00	29.25
20.82	1.12	0.00	29.25
20.84	1.12	0.00	28.75
20.86	1.12	0.00	28.75
20.88	1.12	0.00	28.75
20.90	1.12	0.00	28.75
20.92	1.12	0.00	28.75
20.94	1.12	0.00	30.00
20.96	1.12	0.00	30.50
20.98	1.13	0.00	31.25
21.00	1.13	0.00	31.25
21.02	1.13	0.00	31.75
21.04	1.13	0.00	32.25
21.06	1.13	0.00	32.25
21.08	1.13	0.00	33.00
21.10	1.13	0.00	32.25
21.12	1.13	0.00	32.25
21.14	1.13	0.00	32.25
21.16	1.13	0.00	32.25
21.18	1.13	0.00	31.75
21.20	1.13	0.00	31.25
21.22	1.12	0.00	30.50
21.24	1.13	0.00	31.75
21.26	1.13	0.00	32.25
21.28	1.13	0.00	32.25
21.30	1.13	0.00	32.25
21.32	1.13	0.00	32.25
21.34	1.13	0.00	33.00
21.36	1.13	0.00	33.00
21.38	1.13	0.00	33.00
21.40	1.13	0.00	32.25
21.42	1.13	0.00	32.25
21.44	1.13	0.00	33.00
21.46	1.13	0.00	33.00
21.48	1.13	0.00	33.00
21.50	1.13	0.00	32.25
21.52	1.13	0.00	31.75
21.54	1.13	0.00	31.75
21.56	1.13	0.00	31.75
21.58	1.13	0.00	31.75
21.60	1.13	0.00	31.25
21.62	1.13	0.00	31.25
21.64	1.13	0.00	31.75
21.66	1.13	0.00	32.25
21.68	1.13	0.00	33.00
21.70	1.13	0.00	33.00
21.72	1.13	0.00	33.00
21.74	1.13	0.00	33.50
21.76	1.13	0.00	33.50
21.78	1.13	0.00	33.50
21.80	1.13	0.00	33.00
21.82	1.13	0.00	32.25

Altran Report
95227-TR-01 Rev. 3
Att/Appx. E Sh E133

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
21.84	1.13	0.00	31.75
21.86	1.13	0.00	31.75
21.88	1.13	0.00	31.75
21.90	1.13	0.00	32.25
21.92	1.13	0.00	32.25
21.94	1.13	0.00	32.25
21.96	1.13	0.00	33.00
21.98	1.13	0.00	33.50
22.00	1.13	0.00	33.50
22.02	1.13	0.00	33.00
22.04	1.13	0.00	33.00
22.06	1.13	0.00	33.00
22.08	1.13	0.00	33.00
22.10	1.13	0.00	33.00
22.12	1.13	0.00	33.00
22.14	1.13	0.00	33.00
22.16	1.13	0.00	32.25
22.18	1.13	0.00	32.25
22.20	1.13	0.00	32.25
22.22	1.13	0.00	32.25
22.24	1.13	0.00	32.25
22.26	1.13	0.00	32.25
22.28	1.13	0.00	32.25
22.30	1.13	0.00	31.75
22.32	1.13	0.00	31.75
22.34	1.13	0.00	32.25
22.36	1.13	0.00	32.25
22.38	1.13	0.00	31.75
22.40	1.13	0.00	31.75
22.42	1.13	0.00	31.75
22.44	1.13	0.00	31.75
22.46	1.13	0.00	31.75
22.48	1.13	0.00	31.25
22.50	1.13	0.00	31.25
22.52	1.13	0.00	31.25
22.54	1.12	0.00	30.50
22.56	1.13	0.00	31.25
22.58	1.13	0.00	31.75
22.60	1.13	0.00	31.75
22.62	1.13	0.00	32.25
22.64	1.13	0.00	32.25
22.66	1.13	0.00	32.25
22.68	1.13	0.00	32.25
22.70	1.13	0.00	33.00
22.72	1.13	0.00	32.25
22.74	1.13	0.00	31.25
22.76	1.13	0.00	31.75
22.78	1.13	0.00	31.25
22.80	1.13	0.00	31.25
22.82	1.13	0.00	31.25
22.84	1.13	0.00	31.25
22.86	1.13	0.00	31.25

Altran Report
96227-MR-01 Rev. 3
Att./Appx. E Sh E134

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 24 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.88	1.13	0.00	31.25
22.90	1.13	0.00	31.25
22.92	1.13	0.00	31.25
22.94	1.13	0.00	31.75
22.96	1.13	0.00	31.75
22.98	1.13	0.00	31.25
23.00	1.12	0.00	30.50
23.02	1.13	0.00	31.25
23.04	1.13	0.00	31.75
23.06	1.13	0.00	32.25
23.08	1.13	0.00	33.00
23.10	1.13	0.00	32.25
23.12	1.13	0.00	32.25
23.14	1.13	0.00	33.00
23.16	1.13	0.00	33.00
23.18	1.13	0.00	33.50
23.20	1.13	0.00	33.50
23.22	1.13	0.00	33.00
23.24	1.13	0.00	33.00
23.26	1.13	0.00	33.50
23.28	1.13	0.00	33.50
23.30	1.13	0.00	33.50
23.32	1.14	0.00	34.25
23.34	1.13	0.00	33.50
23.36	1.13	0.00	33.00
23.38	1.13	0.00	31.75
23.40	1.12	0.00	30.50
23.42	1.12	0.00	30.50
23.44	1.13	0.00	31.25
23.46	1.13	0.00	31.25
23.48	1.13	0.00	31.75
23.50	1.13	0.00	32.25
23.52	1.13	0.00	31.75
23.54	1.13	0.00	31.75
23.56	1.13	0.00	32.25
23.58	1.13	0.00	32.25
23.60	1.13	0.00	33.00
23.62	1.13	0.00	33.50
23.64	1.14	0.00	34.25
23.66	1.14	0.00	34.25
23.68	1.14	0.00	34.25
23.70	1.13	0.00	33.50
23.72	1.13	0.00	33.00
23.74	1.13	0.00	33.00
23.76	1.13	0.00	33.00
23.78	1.13	0.00	32.25
23.80	1.13	0.00	31.75
23.82	1.13	0.00	31.75
23.84	1.13	0.00	32.25
23.86	1.13	0.00	33.00
23.88	1.13	0.00	33.00
23.90	1.13	0.00	33.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E135

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
23.92	1.13	0.00	33.50
23.94	1.13	0.00	33.00
23.96	1.13	0.00	32.25
23.98	1.13	0.00	32.25
24.00	1.13	0.00	32.25
24.02	1.13	0.00	32.25
24.04	1.13	0.00	33.00
24.06	1.13	0.00	32.25
24.08	1.13	0.00	32.25
24.10	1.13	0.00	32.25
24.12	1.13	0.00	32.25
24.14	1.13	0.00	32.25
24.16	1.13	0.00	32.25
24.18	1.13	0.00	32.25
24.20	1.13	0.00	31.25
24.22	1.13	0.00	31.25
24.24	1.13	0.00	31.25
24.26	1.13	0.00	31.25
24.28	1.12	0.00	30.50
24.30	1.12	0.00	30.50
24.32	1.12	0.00	30.50
24.34	1.13	0.00	31.25
24.36	1.13	0.00	31.75
24.38	1.13	0.00	32.25
24.40	1.13	0.00	32.25
24.42	1.13	0.00	33.00
24.44	1.13	0.00	32.25
24.46	1.13	0.00	33.00
24.48	1.13	0.00	33.50
24.50	1.13	0.00	33.50
24.52	1.13	0.00	33.50
24.54	1.13	0.00	33.50
24.56	1.14	0.00	34.25
24.58	1.13	0.00	33.50
24.60	1.13	0.00	33.50
24.62	1.13	0.00	33.50
24.64	1.14	0.00	34.25
24.66	1.14	0.00	34.75
24.68	1.14	0.00	34.25
24.70	1.14	0.00	34.75
24.72	1.14	0.00	34.75
24.74	1.14	0.00	35.50
24.76	1.14	0.00	36.00
24.78	1.14	0.00	36.00
24.80	1.14	0.00	35.50
24.82	1.14	0.00	34.25
24.84	1.14	0.00	34.25
24.86	1.14	0.00	34.25
24.88	1.13	0.00	33.50
24.90	1.13	0.00	33.50
24.92	1.13	0.00	33.50
24.94	1.13	0.00	33.50

Altran Report
9227-TR-01 Rev. 3
Att/Appx. E Sh E136

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.96	1.14	0.00	34.25
24.98	1.14	0.00	34.25
25.00	1.14	0.00	34.25
25.02	1.14	0.00	34.75
25.04	1.14	0.00	34.75
25.06	1.14	0.00	34.75
25.08	1.14	0.00	34.25
25.10	1.14	0.00	34.75
25.12	1.14	0.00	34.75
25.14	1.14	0.00	36.00
25.16	1.14	0.00	35.50
25.18	1.14	0.00	35.50
25.20	1.14	0.00	36.00
25.22	1.14	0.00	36.00
25.24	1.14	0.00	36.00
25.26	1.14	0.00	36.00
25.28	1.14	0.00	35.50
25.30	1.14	0.00	34.25
25.32	1.13	0.00	33.50
25.34	1.14	0.00	34.25
25.36	1.13	0.00	33.50
25.38	1.14	0.00	34.25
25.40	1.13	0.00	33.50
25.42	1.13	0.00	33.50
25.44	1.14	0.00	34.25
25.46	1.14	0.00	34.25
25.48	1.14	0.00	34.25
25.50	1.14	0.00	34.25
25.52	1.13	0.00	33.50
25.54	1.13	0.00	33.00
25.56	1.13	0.00	32.25
25.58	1.13	0.00	32.25
25.60	1.13	0.00	32.25
25.62	1.13	0.00	33.00
25.64	1.13	0.00	33.50
25.66	1.13	0.00	33.50
25.68	1.13	0.00	33.00
25.70	1.13	0.00	33.00
25.72	1.13	0.00	33.00
25.74	1.13	0.00	33.50
25.76	1.13	0.00	33.00
25.78	1.13	0.00	33.00
25.80	1.13	0.00	33.00
25.82	1.13	0.00	32.25
25.84	1.13	0.00	32.25
25.86	1.13	0.00	33.00
25.88	1.13	0.00	33.50
25.90	1.13	0.00	33.00
25.92	1.13	0.00	33.00
25.94	1.13	0.00	32.25
25.96	1.13	0.00	32.25
25.98	1.13	0.00	32.25

Altran Report
94227-TR-01 Rev. 3
Att. Appx. E Sh E137

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
26.00	1.12	0.00	30.50
26.02	1.12	0.00	29.25
26.04	1.12	0.00	29.25
26.06	1.12	0.00	29.25
26.08	1.12	0.00	29.25
26.10	1.12	0.00	29.25
26.12	1.12	0.00	30.00
26.14	1.12	0.00	30.50
26.16	1.13	0.00	31.25
26.18	1.13	0.00	31.25
26.20	1.12	0.00	30.50
26.22	1.12	0.00	30.50
26.24	1.12	0.00	30.50
26.26	1.12	0.00	29.25
26.28	1.12	0.00	30.00
26.30	1.12	0.00	30.50
26.32	1.13	0.00	31.25
26.34	1.13	0.00	32.25
26.36	1.13	0.00	33.50
26.38	1.13	0.00	33.00
26.40	1.13	0.00	31.75
26.42	1.13	0.00	31.75
26.44	1.13	0.00	31.25
26.46	1.13	0.00	31.25
26.48	1.13	0.00	31.25
26.50	1.12	0.00	29.25
26.52	1.12	0.00	28.75
26.54	1.11	0.00	28.00
26.56	1.11	0.00	28.00
26.58	1.12	0.00	28.75
26.60	1.12	0.00	29.25
26.62	1.12	0.00	29.25
26.64	1.12	0.00	29.25
26.66	1.12	0.00	29.25
26.68	1.12	0.00	29.25
26.70	1.12	0.00	28.75
26.72	1.12	0.00	28.75
26.74	1.11	0.00	27.50
26.76	1.11	0.00	27.50
26.78	1.11	0.00	28.00
26.80	1.11	0.00	27.50
26.82	1.11	0.00	28.00
26.84	1.11	0.00	28.00
26.86	1.11	0.00	28.00
26.88	1.12	0.00	28.75
26.90	1.12	0.00	28.75
26.92	1.12	0.00	28.75
26.94	1.12	0.00	28.75
26.96	1.12	0.00	28.75
26.98	1.11	0.00	28.00
27.00	1.11	0.00	27.50
27.02	1.11	0.00	28.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E138

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.04	1.12	0.00	28.75
27.06	1.12	0.00	29.25
27.08	1.12	0.00	30.00
27.10	1.12	0.00	30.00
27.12	1.12	0.00	30.00
27.14	1.12	0.00	30.00
27.16	1.12	0.00	30.00
27.18	1.12	0.00	30.00
27.20	1.12	0.00	30.00
27.22	1.12	0.00	30.00
27.24	1.12	0.00	30.00
27.26	1.12	0.00	30.50
27.28	1.12	0.00	30.50
27.30	1.12	0.00	30.00
27.32	1.12	0.00	30.00
27.34	1.12	0.00	30.00
27.36	1.12	0.00	30.00
27.38	1.12	0.00	28.75
27.40	1.11	0.00	28.00
27.42	1.12	0.00	28.75
27.44	1.11	0.00	28.00
27.46	1.12	0.00	28.75
27.48	1.12	0.00	28.75
27.50	1.11	0.00	28.00
27.52	1.11	0.00	28.00
27.54	1.12	0.00	28.75
27.56	1.12	0.00	28.75
27.58	1.11	0.00	28.00
27.60	1.11	0.00	27.50
27.62	1.11	0.00	27.50
27.64	1.11	0.00	28.00
27.66	1.12	0.00	28.75
27.68	1.12	0.00	28.75
27.70	1.11	0.00	28.00
27.72	1.11	0.00	27.50
27.74	1.11	0.00	27.50
27.76	1.11	0.00	26.25
27.78	1.11	0.00	26.25
27.80	1.10	0.00	25.75
27.82	1.11	0.00	26.25
27.84	1.11	0.00	26.25
27.86	1.11	0.00	26.75
27.88	1.11	0.00	27.50
27.90	1.11	0.00	27.50
27.92	1.11	0.00	28.00
27.94	1.11	0.00	28.00
27.96	1.11	0.00	28.00
27.98	1.11	0.00	27.50
28.00	1.11	0.00	27.50
28.02	1.11	0.00	27.50
28.04	1.11	0.00	27.50
28.06	1.11	0.00	28.00

Altran Report
96227-TR-01 Rev. 3
Adj/Appx. E Sh E139

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
28.08	1.11	0.00	27.50
28.10	1.11	0.00	26.75
28.12	1.11	0.00	26.75
28.14	1.11	0.00	26.75
28.16	1.11	0.00	26.75
28.18	1.11	0.00	27.50
28.20	1.11	0.00	27.50
28.22	1.11	0.00	26.75
28.24	1.11	0.00	26.75
28.26	1.11	0.00	26.25
28.28	1.10	0.00	25.00
28.30	1.10	0.00	23.75
28.32	1.10	0.00	23.75
28.34	1.10	0.00	23.75
28.36	1.10	0.00	23.75
28.38	1.10	0.00	23.75
28.40	1.10	0.00	23.75
28.42	1.09	0.00	23.25
28.44	1.10	0.00	23.75
28.46	1.10	0.00	23.75
28.48	1.10	0.00	24.50
28.50	1.10	0.00	25.00
28.52	1.10	0.00	25.00
28.54	1.10	0.00	25.00
28.56	1.10	0.00	25.75
28.58	1.10	0.00	25.00
28.60	1.10	0.00	25.00
28.62	1.10	0.00	24.50
28.64	1.10	0.00	23.75
28.66	1.10	0.00	23.75
28.68	1.09	0.00	23.25
28.70	1.09	0.00	22.50
28.72	1.09	0.00	23.25
28.74	1.10	0.00	24.50
28.76	1.10	0.00	24.50
28.78	1.10	0.00	24.50
28.80	1.10	0.00	24.50
28.82	1.10	0.00	23.75
28.84	1.10	0.00	23.75
28.86	1.10	0.00	23.75
28.88	1.10	0.00	23.75
28.90	1.09	0.00	23.25
28.92	1.10	0.00	23.75
28.94	1.10	0.00	24.50
28.96	1.10	0.00	23.75
28.98	1.10	0.00	23.75
29.00	1.10	0.00	23.75
29.02	1.09	0.00	22.50
29.04	1.09	0.00	23.25
29.06	1.09	0.00	22.50
29.08	1.09	0.00	22.00
29.10	1.09	0.00	22.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E140

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 30 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.12	1.09	0.00	22.00
29.14	1.09	0.00	22.00
29.16	1.09	0.00	22.50
29.18	1.09	0.00	22.00
29.20	1.09	0.00	21.25
29.22	1.08	0.00	20.75
29.24	1.08	0.00	20.75
29.26	1.09	0.00	21.25
29.28	1.09	0.00	21.25
29.30	1.08	0.00	20.75
29.32	1.08	0.00	20.75
29.34	1.08	0.00	20.75
29.36	1.08	0.00	20.75
29.38	1.08	0.00	20.25
29.40	1.08	0.00	20.25
29.42	1.08	0.00	19.50
29.44	1.08	0.00	19.50
29.46	1.08	0.00	19.00
29.48	1.08	0.00	19.00
29.50	1.07	0.00	17.75
29.52	1.07	0.00	17.75
29.54	1.07	0.00	17.75
29.56	1.07	0.00	17.75
29.58	1.07	0.00	17.75
29.60	1.07	0.00	17.75
29.62	1.07	0.00	17.75
29.64	1.07	0.00	18.25
29.66	1.07	0.00	17.75
29.68	1.07	0.00	17.00
29.70	1.07	0.00	17.00
29.72	1.07	0.00	17.00
29.74	1.07	0.00	17.00
29.76	1.07	0.00	16.50
29.78	1.07	0.00	16.50
29.80	1.06	0.00	15.75
29.82	1.07	0.00	16.50
29.84	1.07	0.00	17.00
29.86	1.07	0.00	17.00
29.88	1.07	0.00	17.00
29.90	1.07	0.00	16.50
29.92	1.07	0.00	17.00
29.94	1.07	0.00	18.25
29.96	1.07	0.00	18.25
29.98	1.07	0.00	18.25
30.00	1.07	0.00	17.75
30.02	1.07	0.00	18.25
30.04	1.07	0.00	17.75
30.06	1.07	0.00	17.75
30.08	1.07	0.00	17.75
30.10	1.07	0.00	16.50
30.12	1.06	0.00	15.75
30.14	1.06	0.00	15.25

Altran Report
96227-NR.01 Rev. 3
Att/Apox. E Sh E141

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
30.16	1.06	0.00	14.75
30.18	1.06	0.00	14.75
30.20	1.06	0.00	14.00
30.22	1.06	0.00	14.75
30.24	1.06	0.00	14.75
30.26	1.06	0.00	14.75
30.28	1.06	0.00	14.00
30.30	1.06	0.00	14.00
30.32	1.05	0.00	13.50
30.34	1.06	0.00	14.00
30.36	1.06	0.00	14.00
30.38	1.06	0.00	14.00
30.40	1.05	0.00	13.50
30.42	1.05	0.00	13.50
30.44	1.05	0.00	13.50
30.46	1.06	0.00	14.00
30.48	1.05	0.00	13.50
30.50	1.05	0.00	13.50
30.52	1.05	0.00	12.75
30.54	1.05	0.00	12.75
30.56	1.05	0.00	12.75
30.58	1.05	0.00	12.25
30.60	1.05	0.00	12.75
30.62	1.05	0.00	13.50
30.64	1.05	0.00	12.75
30.66	1.05	0.00	12.25
30.68	1.04	0.00	11.00
30.70	1.04	0.00	11.00
30.72	1.05	0.00	11.50
30.74	1.05	0.00	12.25
30.76	1.05	0.00	12.25
30.78	1.05	0.00	11.50
30.80	1.05	0.00	11.50
30.82	1.05	0.00	11.50
30.84	1.05	0.00	11.50
30.86	1.05	0.00	12.25
30.88	1.05	0.00	12.25
30.90	1.04	0.00	11.00
30.92	1.04	0.00	11.00
30.94	1.05	0.00	11.50
30.96	1.05	0.00	12.25
30.98	1.05	0.00	12.75
31.00	1.05	0.00	11.50
31.02	1.04	0.00	11.00
31.04	1.04	0.00	11.00
31.06	1.04	0.00	11.00
31.08	1.04	0.00	11.00
31.10	1.04	0.00	10.50
31.12	1.04	0.00	10.50
31.14	1.04	0.00	10.50
31.16	1.04	0.00	10.50
31.18	1.04	0.00	9.75

Altran Report
9627-TR-01 Rev. 3
Att./Appx. E Sh E142

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 32 of 42

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
31.20	1.04	0.00	9.75
31.22	1.04	0.00	10.50
31.24	1.04	0.00	11.00
31.26	1.05	0.00	11.50
31.28	1.04	0.00	11.00
31.30	1.04	0.00	10.50
31.32	1.04	0.00	9.75
31.34	1.04	0.00	9.25
31.36	1.04	0.00	9.25
31.38	1.03	0.00	8.50
31.40	1.03	0.00	8.00
31.42	1.03	0.00	8.00
31.44	1.03	0.00	8.00
31.46	1.03	0.00	8.00
31.48	1.03	0.00	8.00
31.50	1.03	0.00	7.25
31.52	1.03	0.00	7.25
31.54	1.03	0.00	6.75
31.56	1.03	0.00	7.25
31.58	1.03	0.00	7.25
31.60	1.03	0.00	7.25
31.62	1.03	0.00	7.25
31.64	1.03	0.00	7.25
31.66	1.03	0.00	7.25
31.68	1.03	0.00	6.75
31.70	1.02	0.00	5.50
31.72	1.02	0.00	5.50
31.74	1.02	0.00	5.00
31.76	1.02	0.00	5.00
31.78	1.02	0.00	5.00
31.80	1.02	0.00	5.00
31.82	1.02	0.00	5.00
31.84	1.02	0.00	5.00
31.86	1.02	0.00	4.25
31.88	1.02	0.00	4.25
31.90	1.02	0.00	5.00
31.92	1.02	0.00	4.25
31.94	1.02	0.00	4.25
31.96	1.02	0.00	4.25
31.98	1.01	0.00	3.00
32.00	1.01	0.00	3.00
32.02	1.01	0.00	3.00
32.04	1.01	0.00	2.50
32.06	1.01	0.00	1.75
32.08	1.01	0.00	2.50
32.10	1.01	0.00	1.25
32.12	1.00	0.00	0.50
32.14	1.00	0.00	0.50
32.16	1.00	0.00	0.50
32.18	1.00	0.00	0.00
32.20	1.00	0.00	-0.60
32.22	1.00	0.00	-1.23

Altran Report
91227-02-01 Rev. 3
Att./Appx. E Sh E143

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
32.24	1.00	0.00	-1.23
32.26	0.99	0.00	-1.82
32.28	0.99	0.00	-1.82
32.30	0.99	0.00	-1.82
32.32	0.99	0.00	-1.82
32.34	0.99	0.00	-2.45
32.36	0.99	0.00	-2.45
32.38	0.99	0.00	-2.45
32.40	0.99	0.00	-3.05
32.42	0.99	0.00	-3.05
32.44	0.99	0.00	-3.05
32.46	0.99	0.00	-3.05
32.48	0.99	0.00	-3.68
32.50	0.99	0.00	-3.68
32.52	0.98	0.00	-4.87
32.54	0.98	0.00	-4.28
32.56	0.98	0.00	-4.87
32.58	0.98	0.00	-4.87
32.60	0.98	0.00	-4.87
32.62	0.98	0.00	-5.50
32.64	0.98	0.00	-5.50
32.66	0.98	0.00	-6.10
32.68	0.97	0.00	-6.73
32.70	0.97	0.00	-6.73
32.72	0.97	0.00	-7.33
32.74	0.97	0.00	-7.33
32.76	0.97	0.00	-7.33
32.78	0.97	0.00	-6.73
32.80	0.97	0.00	-7.33
32.82	0.97	0.00	-7.33
32.84	0.97	0.00	-7.33
32.86	0.97	0.00	-7.92
32.88	0.97	0.00	-7.92
32.90	0.97	0.00	-7.92
32.92	0.97	0.00	-8.55
32.94	0.97	0.00	-8.55
32.96	0.97	0.00	-8.55
32.98	0.97	0.00	-8.55
33.00	0.96	0.00	-9.15
33.02	0.96	0.00	-9.78
33.04	0.96	0.00	-10.38
33.06	0.96	0.00	-10.38
33.08	0.96	0.00	-10.38
33.10	0.96	0.00	-10.38
33.12	0.96	0.00	-10.38
33.14	0.96	0.00	-9.78
33.16	0.96	0.00	-9.15
33.18	0.97	0.00	-7.92
33.20	0.97	0.00	-7.92
33.22	0.97	0.00	-8.55
33.24	0.96	0.00	-9.15
33.26	0.96	0.00	-9.78

Altran Report
96227-RR-01 Rev. 3
Att./Appx. E Sh. E149

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
33.28	0.96	0.00	-10.38
33.30	0.96	0.00	-10.38
33.32	0.96	0.00	-11.00
33.34	0.96	0.00	-11.00
33.36	0.95	0.00	-11.60
33.38	0.95	0.00	-11.60
33.40	0.95	0.00	-11.60
33.42	0.96	0.00	-11.00
33.44	0.96	0.00	-11.00
33.46	0.96	0.00	-11.00
33.48	0.96	0.00	-11.00
33.50	0.96	0.00	-11.00
33.52	0.96	0.00	-10.38
33.54	0.96	0.00	-9.78
33.56	0.96	0.00	-10.38
33.58	0.96	0.00	-11.00
33.60	0.95	0.00	-11.60
33.62	0.95	0.00	-12.20
33.64	0.95	0.00	-12.20
33.66	0.95	0.00	-12.20
33.68	0.95	0.00	-12.20
33.70	0.95	0.00	-11.60
33.72	0.95	0.00	-11.60
33.74	0.95	0.00	-11.60
33.76	0.96	0.00	-11.00
33.78	0.96	0.00	-11.00
33.80	0.96	0.00	-11.00
33.82	0.96	0.00	-11.00
33.84	0.96	0.00	-11.00
33.86	0.96	0.00	-11.00
33.88	0.95	0.00	-11.60
33.90	0.95	0.00	-11.60
33.92	0.95	0.00	-11.60
33.94	0.95	0.00	-11.60
33.96	0.95	0.00	-11.60
33.98	0.95	0.00	-11.60
34.00	0.95	0.00	-11.60
34.02	0.95	0.00	-12.20
34.04	0.95	0.00	-12.20
34.06	0.95	0.00	-12.20
34.08	0.95	0.00	-12.20
34.10	0.95	0.00	-12.20
34.12	0.95	0.00	-12.20
34.14	0.95	0.00	-12.20
34.16	0.95	0.00	-11.60
34.18	0.95	0.00	-11.60
34.20	0.95	0.00	-12.20
34.22	0.95	0.00	-12.83
34.24	0.95	0.00	-12.83
34.26	0.95	0.00	-13.43
34.28	0.95	0.00	-13.43
34.30	0.94	0.00	-14.05

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E145

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
34.32	0.94	0.00	-14.65
34.34	0.94	0.00	-15.88
34.36	0.94	0.00	-15.88
34.38	0.94	0.00	-15.88
34.40	0.93	0.00	-16.48
34.42	0.93	0.00	-17.70
34.44	0.93	0.00	-17.70
34.46	0.93	0.00	-18.33
34.48	0.92	0.00	-18.93
34.50	0.92	0.00	-20.15
34.52	0.92	0.00	-18.93
34.54	0.93	0.00	-18.33
34.56	0.93	0.00	-17.70
34.58	0.93	0.00	-17.10
34.60	0.93	0.00	-17.10
34.62	0.93	0.00	-18.33
34.64	0.93	0.00	-17.70
34.66	0.93	0.00	-18.33
34.68	0.92	0.00	-18.93
34.70	0.92	0.00	-19.53
34.72	0.92	0.00	-18.93
34.74	0.93	0.00	-18.33
34.76	0.93	0.00	-17.10
34.78	0.93	0.00	-17.10
34.80	0.93	0.00	-17.70
34.82	0.93	0.00	-17.70
34.84	0.93	0.00	-17.10
34.86	0.93	0.00	-16.48
34.88	0.94	0.00	-15.88
34.90	0.94	0.00	-15.88
34.92	0.93	0.00	-16.48
34.94	0.93	0.00	-16.48
34.96	0.93	0.00	-17.10
34.98	0.93	0.00	-17.10
35.00	0.93	0.00	-17.10
35.02	0.93	0.00	-17.10
35.04	0.93	0.00	-17.70
35.06	0.93	0.00	-17.70
35.08	0.93	0.00	-17.70
35.10	0.93	0.00	-17.70
35.12	0.93	0.00	-17.10
35.14	0.93	0.00	-17.70
35.16	0.93	0.00	-18.33
35.18	0.92	0.00	-18.93
35.20	0.92	0.00	-19.53
35.22	0.92	0.00	-18.93
35.24	0.92	0.00	-18.93
35.26	0.93	0.00	-18.33
35.28	0.92	0.00	-18.93
35.30	0.93	0.00	-18.33
35.32	0.92	0.00	-18.93
35.34	0.93	0.00	-18.33

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E146

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
35.36	0.93	0.00	-18.33
35.38	0.93	0.00	-18.33
35.40	0.93	0.00	-18.33
35.42	0.93	0.00	-18.33
35.44	0.93	0.00	-18.33
35.46	0.93	0.00	-18.33
35.48	0.93	0.00	-18.33
35.50	0.93	0.00	-18.33
35.52	0.92	0.00	-18.93
35.54	0.92	0.00	-18.93
35.56	0.93	0.00	-18.33
35.58	0.92	0.00	-18.93
35.60	0.93	0.00	-18.33
35.62	0.92	0.00	-18.93
35.64	0.92	0.00	-18.93
35.66	0.92	0.00	-18.93
35.68	0.92	0.00	-18.93
35.70	0.93	0.00	-18.33
35.72	0.93	0.00	-18.33
35.74	0.93	0.00	-18.33
35.76	0.93	0.00	-18.33
35.78	0.93	0.00	-17.70
35.80	0.93	0.00	-17.70
35.82	0.93	0.00	-17.70
35.84	0.93	0.00	-17.70
35.86	0.93	0.00	-17.10
35.88	0.93	0.00	-17.10
35.90	0.93	0.00	-17.10
35.92	0.93	0.00	-16.48
35.94	0.93	0.00	-16.48
35.96	0.93	0.00	-16.48
35.98	0.93	0.00	-16.48
36.00	0.93	0.00	-17.10
36.02	0.93	0.00	-17.70
36.04	0.93	0.00	-17.70
36.06	0.93	0.00	-17.70
36.08	0.93	0.00	-17.10
36.10	0.93	0.00	-17.10
36.12	0.93	0.00	-17.70
36.14	0.93	0.00	-18.33
36.16	0.93	0.00	-18.33
36.18	0.93	0.00	-18.33
36.20	0.92	0.00	-18.93
36.22	0.93	0.00	-18.33
36.24	0.93	0.00	-18.33
36.26	0.93	0.00	-18.33
36.28	0.93	0.00	-18.33
36.30	0.93	0.00	-18.33
36.32	0.93	0.00	-18.33
36.34	0.93	0.00	-17.70
36.36	0.93	0.00	-18.33
36.38	0.93	0.00	-17.70

Altran Report
96427-TR-01 Rev. 3
Att/Appx. E Sh E147

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 37 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
36.40	0.93	0.00	-18.33
36.42	0.93	0.00	-17.70
36.44	0.93	0.00	-17.70
36.46	0.93	0.00	-17.70
36.48	0.93	0.00	-17.70
36.50	0.93	0.00	-18.33
36.52	0.93	0.00	-18.33
36.54	0.93	0.00	-18.33
36.56	0.93	0.00	-18.33
36.58	0.93	0.00	-18.33
36.60	0.92	0.00	-18.93
36.62	0.93	0.00	-18.33
36.64	0.93	0.00	-17.10
36.66	0.93	0.00	-16.48
36.68	0.93	0.00	-16.48
36.70	0.93	0.00	-17.10
36.72	0.93	0.00	-17.10
36.74	0.93	0.00	-17.10
36.76	0.93	0.00	-17.10
36.78	0.93	0.00	-17.10
36.80	0.93	0.00	-17.70
36.82	0.93	0.00	-17.70
36.84	0.93	0.00	-17.70
36.86	0.93	0.00	-17.70
36.88	0.93	0.00	-17.10
36.90	0.93	0.00	-17.70
36.92	0.93	0.00	-17.70
36.94	0.93	0.00	-17.70
36.96	0.93	0.00	-17.10
36.98	0.93	0.00	-17.70
37.00	0.93	0.00	-18.33
37.02	0.92	0.00	-18.93
37.04	0.92	0.00	-18.93
37.06	0.93	0.00	-18.33
37.08	0.93	0.00	-18.33
37.10	0.92	0.00	-18.93
37.12	0.92	0.00	-18.93
37.14	0.93	0.00	-18.33
37.16	0.92	0.00	-18.93
37.18	0.93	0.00	-18.33
37.20	0.93	0.00	-17.10
37.22	0.93	0.00	-16.48
37.24	0.94	0.00	-15.28
37.26	0.94	0.00	-14.65
37.28	0.94	0.00	-15.28
37.30	0.94	0.00	-15.28
37.32	0.94	0.00	-15.28
37.34	0.94	0.00	-15.28
37.36	0.94	0.00	-14.65
37.38	0.94	0.00	-15.28
37.40	0.94	0.00	-15.28
37.42	0.94	0.00	-15.28

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E148

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 38 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
37.44	0.94	0.00	-14.65
37.46	0.94	0.00	-15.28
37.48	0.94	0.00	-15.88
37.50	0.93	0.00	-16.48
37.52	0.93	0.00	-16.48
37.54	0.94	0.00	-15.88
37.56	0.94	0.00	-15.88
37.58	0.93	0.00	-16.48
37.60	0.93	0.00	-16.48
37.62	0.93	0.00	-16.48
37.64	0.94	0.00	-15.88
37.66	0.94	0.00	-15.28
37.68	0.94	0.00	-15.28
37.70	0.94	0.00	-15.28
37.72	0.94	0.00	-14.65
37.74	0.94	0.00	-14.05
37.76	0.95	0.00	-13.43
37.78	0.94	0.00	-14.05
37.80	0.95	0.00	-13.43
37.82	0.95	0.00	-13.43
37.84	0.95	0.00	-12.20
37.86	0.96	0.00	-11.00
37.88	0.96	0.00	-9.78
37.90	0.97	0.00	-7.92
37.92	0.97	0.00	-6.73
37.94	0.98	0.00	-5.50
37.96	0.98	0.00	-4.28
37.98	0.99	0.00	-3.05
38.00	0.99	0.00	-2.45
38.02	0.99	0.00	-1.82
38.04	0.99	0.00	-2.45
38.06	0.99	0.00	-2.45
38.08	0.99	0.00	-1.82
38.10	1.00	0.00	-1.23
38.12	1.01	0.00	3.00
38.14	1.05	0.00	13.50
38.16	1.13	0.00	32.25
38.18	1.27	0.00	67.75
38.20	1.44	0.00	110.00
38.22	1.53	0.00	133.00
38.24	1.52	0.00	129.50
38.26	1.46	0.00	114.75
38.28	1.42	0.00	104.50
38.30	1.42	0.00	103.75
38.32	1.45	0.00	113.50
38.34	1.48	0.00	119.00
38.36	1.45	0.00	112.25
38.38	1.38	0.00	95.25
38.40	1.30	0.00	74.50
38.42	1.23	0.00	56.25
38.44	1.17	0.00	43.25
38.46	1.14	0.00	36.00

Altran Report
96227-AR-01 Rev. 3
Att./Appx. E Sh E149

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
38.48	1.16	0.00	39.00
38.50	1.25	0.00	63.00
38.52	1.49	0.00	122.75
38.54	1.69	0.00	172.75
38.56	1.72	0.00	179.50
38.58	1.65	0.00	161.25
38.60	1.57	0.00	141.75
38.62	1.51	0.00	127.00
38.64	1.47	0.00	116.50
38.66	1.43	0.00	108.00
38.68	1.40	0.00	100.00
38.70	1.39	0.00	97.00
38.72	1.39	0.00	97.75
38.74	1.40	0.00	100.75
38.76	1.42	0.00	104.50
38.78	1.42	0.00	104.50
38.80	1.41	0.00	101.25
38.82	1.38	0.00	95.75
38.84	1.36	0.00	90.25
38.86	1.34	0.00	86.00
38.88	1.34	0.00	86.00
38.90	1.37	0.00	92.75
38.92	1.45	0.00	112.25
38.94	1.56	0.00	139.75
38.96	1.63	0.00	158.00
38.98	1.65	0.00	162.50
39.00	1.63	0.00	157.00
39.02	1.59	0.00	148.25
39.04	1.55	0.00	137.25
39.06	1.49	0.00	123.25
39.08	1.44	0.00	108.75
39.10	1.39	0.00	96.50
39.12	1.35	0.00	88.50
39.14	1.35	0.00	88.00
39.16	1.37	0.00	92.25
39.18	1.39	0.00	97.75
39.20	1.41	0.00	102.00
39.22	1.41	0.00	101.25
39.24	1.39	0.00	97.75
39.26	1.37	0.00	92.25
39.28	1.35	0.00	88.00
39.30	1.35	0.00	86.75
39.32	1.36	0.00	91.00
39.34	1.40	0.00	99.00
39.36	1.43	0.00	108.00
39.38	1.46	0.00	114.75
39.40	1.48	0.00	119.00
39.42	1.49	0.00	121.50
39.44	1.49	0.00	121.50
39.46	1.48	0.00	119.75
39.48	1.45	0.00	113.00
39.50	1.40	0.00	100.75

Altran Report
916227-TR-01 Rev. 3
Att./Appx. E Sh E150

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 40 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
39.52	1.34	0.00	85.50
39.54	1.28	0.00	70.75
39.56	1.24	0.00	59.25
39.58	1.21	0.00	52.50
39.60	1.22	0.00	53.75
39.62	1.26	0.00	64.75
39.64	1.34	0.00	86.00
39.66	1.41	0.00	103.25
39.68	1.43	0.00	106.75
39.70	1.39	0.00	97.00
39.72	1.33	0.00	81.75
39.74	1.26	0.00	66.00
39.76	1.22	0.00	55.00
39.78	1.20	0.00	49.50
39.80	1.21	0.00	53.00
39.82	1.28	0.00	70.75
39.84	1.39	0.00	98.25
39.86	1.47	0.00	117.25
39.88	1.46	0.00	116.00
39.90	1.40	0.00	100.00
39.92	1.32	0.00	79.25
39.94	1.24	0.00	61.00
39.96	1.19	0.00	47.50
39.98	1.15	0.00	38.50
40.00	1.14	0.00	34.25
40.02	1.14	0.00	34.25
40.04	1.17	0.00	41.50
40.06	1.24	0.00	59.25
40.08	1.33	0.00	81.25
40.10	1.38	0.00	94.00
40.12	1.37	0.00	91.50
40.14	1.31	0.00	77.50
40.16	1.24	0.00	60.50
40.18	1.18	0.00	45.75
40.20	1.15	0.00	37.25
40.22	1.15	0.00	37.25
40.24	1.20	0.00	49.50
40.26	1.30	0.00	75.00
40.28	1.40	0.00	100.00
40.30	1.44	0.00	108.75
40.32	1.40	0.00	100.00
40.34	1.33	0.00	83.00
40.36	1.26	0.00	66.00
40.38	1.21	0.00	52.50
40.40	1.18	0.00	45.75
40.42	1.19	0.00	47.00
40.44	1.24	0.00	59.25
40.46	1.33	0.00	81.75
40.48	1.41	0.00	101.25
40.50	1.43	0.00	107.50
40.52	1.39	0.00	98.25
40.54	1.33	0.00	83.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E151

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
40.56	1.27	0.00	67.25
40.58	1.23	0.00	56.75
40.60	1.21	0.00	52.00
40.62	1.22	0.00	55.50
40.64	1.27	0.00	68.50
40.66	1.35	0.00	88.50
40.68	1.42	0.00	103.75
40.70	1.43	0.00	106.25
40.72	1.39	0.00	97.75
40.74	1.34	0.00	84.75
40.76	1.29	0.00	72.00
40.78	1.25	0.00	63.50
40.80	1.24	0.00	61.00
40.82	1.26	0.00	65.25
40.84	1.30	0.00	75.00
40.86	1.35	0.00	86.75
40.88	1.37	0.00	93.50
40.90	1.38	0.00	94.75
40.92	1.36	0.00	91.00
40.94	1.34	0.00	85.50
40.96	1.32	0.00	80.50
40.98	1.32	0.00	78.75
41.00	1.31	0.00	77.50
41.02	1.31	0.00	77.00
41.04	1.31	0.00	77.50
41.06	1.32	0.00	79.25
41.08	1.33	0.00	83.00
41.10	1.36	0.00	89.25
41.12	1.38	0.00	94.00
41.14	1.38	0.00	95.25
41.16	1.37	0.00	92.25
41.18	1.34	0.00	84.75
41.20	1.31	0.00	76.25
41.22	1.28	0.00	70.25
41.24	1.27	0.00	68.50
41.26	1.28	0.00	70.75
41.28	1.32	0.00	80.50
41.30	1.37	0.00	92.75
41.32	1.41	0.00	101.25
41.34	1.40	0.00	100.75
41.36	1.37	0.00	93.50
41.38	1.33	0.00	82.50
41.40	1.29	0.00	72.75
41.42	1.27	0.00	67.75
41.44	1.28	0.00	69.50
41.46	1.31	0.00	76.25
41.48	1.34	0.00	85.50
41.50	1.37	0.00	92.25
41.52	1.38	0.00	94.00
41.54	1.36	0.00	91.00
41.56	1.34	0.00	84.75
41.58	1.32	0.00	78.75

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E152

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 42 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
41.60	1.30	0.00	75.00
41.62	1.29	0.00	73.25
41.64	1.30	0.00	75.00
41.66	1.32	0.00	78.75
41.68	1.34	0.00	83.75
41.70	1.35	0.00	88.50
41.72	1.36	0.00	91.00
41.74	1.36	0.00	89.75
41.76	1.35	0.00	86.75
41.78	1.33	0.00	81.75
41.80	1.32	0.00	78.75
41.82	1.31	0.00	77.00
41.84	1.32	0.00	78.75
41.86	1.33	0.00	81.25
41.88	1.34	0.00	83.75
41.90	1.34	0.00	84.75
41.92	1.34	0.00	84.25
41.94	1.33	0.00	82.50
41.96	1.32	0.00	80.00
41.98	1.31	0.00	78.25
42.00	1.31	0.00	77.50
42.02	1.31	0.00	78.25
42.04	1.31	0.00	78.25
42.06	1.32	0.00	78.75
42.08	1.32	0.00	78.75
42.10	1.31	0.00	78.25
42.12	1.31	0.00	77.50
42.14	1.32	0.00	78.75
42.16	1.32	0.00	80.50
42.18	1.33	0.00	83.00
42.20	1.34	0.00	85.50
42.22	1.34	0.00	86.00
42.24	1.34	0.00	85.50
42.26	1.34	0.00	83.75
42.28	1.33	0.00	81.75
42.30	1.32	0.00	79.25
42.32	1.31	0.00	78.25
42.34	1.32	0.00	78.75
42.36	1.32	0.00	80.50
42.38	1.34	0.00	83.75
42.40	1.34	0.00	86.00
42.42	1.35	0.00	88.00
42.44	1.35	0.00	87.25
42.46	1.34	0.00	85.50
42.48	1.33	0.00	81.75
42.50	1.32	0.00	78.75
42.52	1.31	0.00	77.50
42.54	1.31	0.00	78.25
42.56	1.32	0.00	79.25
42.58	1.33	0.00	81.75
42.60	1.34	0.00	84.25
42.62	1.34	0.00	84.75

Altran Report
96227-98-01 Rev. 3
Att/Appx. E Sh. E153

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 43 of 44

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
42.64	1.33	0.00	82.50
42.66	1.32	0.00	78.75
42.68	1.30	0.00	74.50
42.70	1.29	0.00	71.50
42.72	1.28	0.00	70.75
42.74	1.29	0.00	72.00
42.76	1.30	0.00	75.00
42.78	1.31	0.00	78.25
42.80	1.32	0.00	79.25
42.82	1.32	0.00	79.25
42.84	1.31	0.00	77.50
42.86	1.30	0.00	75.75
42.88	1.30	0.00	74.50
42.90	1.30	0.00	74.50
42.92	1.30	0.00	75.75
42.94	1.31	0.00	78.25
42.96	1.31	0.00	78.25
42.98	1.31	0.00	78.25
43.00	1.31	0.00	77.50
43.02	1.31	0.00	77.00
43.04	1.31	0.00	77.50
43.06	1.31	0.00	78.25
43.08	1.31	0.00	78.25
43.10	1.31	0.00	77.50
43.12	1.31	0.00	77.00
43.14	1.31	0.00	76.25
43.16	1.30	0.00	75.00
43.18	1.30	0.00	74.50
43.20	1.29	0.00	73.25
43.22	1.30	0.00	73.75
43.24	1.30	0.00	75.75
43.26	1.31	0.00	77.50
43.28	1.32	0.00	79.25
43.30	1.32	0.00	80.50
43.32	1.32	0.00	80.50
43.34	1.32	0.00	78.75
43.36	1.30	0.00	75.75
43.38	1.29	0.00	73.25
43.40	1.29	0.00	73.25
43.42	1.30	0.00	75.75
43.44	1.32	0.00	80.00
43.46	1.33	0.00	82.50
43.48	1.34	0.00	83.75
43.50	1.33	0.00	82.50
43.52	1.32	0.00	79.25
43.54	1.31	0.00	77.00
43.56	1.30	0.00	73.75
43.58	1.29	0.00	72.00
43.60	1.29	0.00	72.75
43.62	1.30	0.00	75.75
43.64	1.32	0.00	79.25
43.66	1.33	0.00	81.25

Altran Report
96 27-TP-01 Rev. 3
Att./Appx. E Sh. E154

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 44 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
43.68	1.33	0.00	81.75
43.70	1.32	0.00	80.00
43.72	1.31	0.00	76.25
43.74	1.30	0.00	73.75
43.76	1.30	0.00	73.75
43.78	1.30	0.00	75.75
43.80	1.31	0.00	78.25
43.82	1.32	0.00	80.00
43.84	1.33	0.00	81.25
43.86	1.32	0.00	80.50
43.88	1.32	0.00	78.75
43.90	1.31	0.00	78.25
43.92	1.31	0.00	78.25
43.94	1.32	0.00	79.25
43.96	1.32	0.00	80.50
43.98	1.32	0.00	80.50
44.00	1.32	0.00	80.00
44.02	1.32	0.00	80.00
44.04	1.33	0.00	81.25
44.06	1.33	0.00	81.25
44.08	1.33	0.00	81.75
44.10	1.33	0.00	81.75
44.12	1.33	0.00	81.75
44.14	1.33	0.00	81.75
44.16	1.33	0.00	81.75
44.18	1.33	0.00	81.25
44.20	1.33	0.00	81.75
44.22	1.33	0.00	82.50
44.24	1.33	0.00	82.50
44.26	1.33	0.00	82.50
44.28	1.33	0.00	82.50
44.30	1.33	0.00	81.25
44.32	1.33	0.00	81.75
44.34	1.33	0.00	82.50
44.36	1.33	0.00	83.00
44.38	1.33	0.00	82.50
44.40	1.33	0.00	83.00
44.42	1.33	0.00	82.50
44.44	1.33	0.00	82.50
44.46	1.33	0.00	82.50
44.48	1.34	0.00	83.75
44.50	1.34	0.00	84.75
44.52	1.35	0.00	87.25
44.54	1.35	0.00	88.50
44.56	1.35	0.00	88.50
44.58	1.35	0.00	87.25
44.60	1.34	0.00	84.25
44.62	1.34	0.00	84.25
44.64	1.35	0.00	86.75
44.66	1.36	0.00	89.25
44.68	1.37	0.00	91.50
44.70	1.36	0.00	91.00

Altran Report
96227-TR-01 Rev. 3
Ad/Appx. E Sh E155

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 45 of 46

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
44.72	1.36	0.00	89.25
44.74	1.35	0.00	86.75
44.76	1.34	0.00	86.00
44.78	1.34	0.00	86.00
44.80	1.35	0.00	87.25
44.82	1.35	0.00	88.00
44.84	1.35	0.00	87.25
44.86	1.35	0.00	86.75
44.88	1.34	0.00	85.50
44.90	1.34	0.00	85.50
44.92	1.34	0.00	85.50
44.94	1.35	0.00	86.75
44.96	1.35	0.00	86.75
44.98	1.34	0.00	85.50
45.00	1.34	0.00	84.25

Attachment 3 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 46 of 46

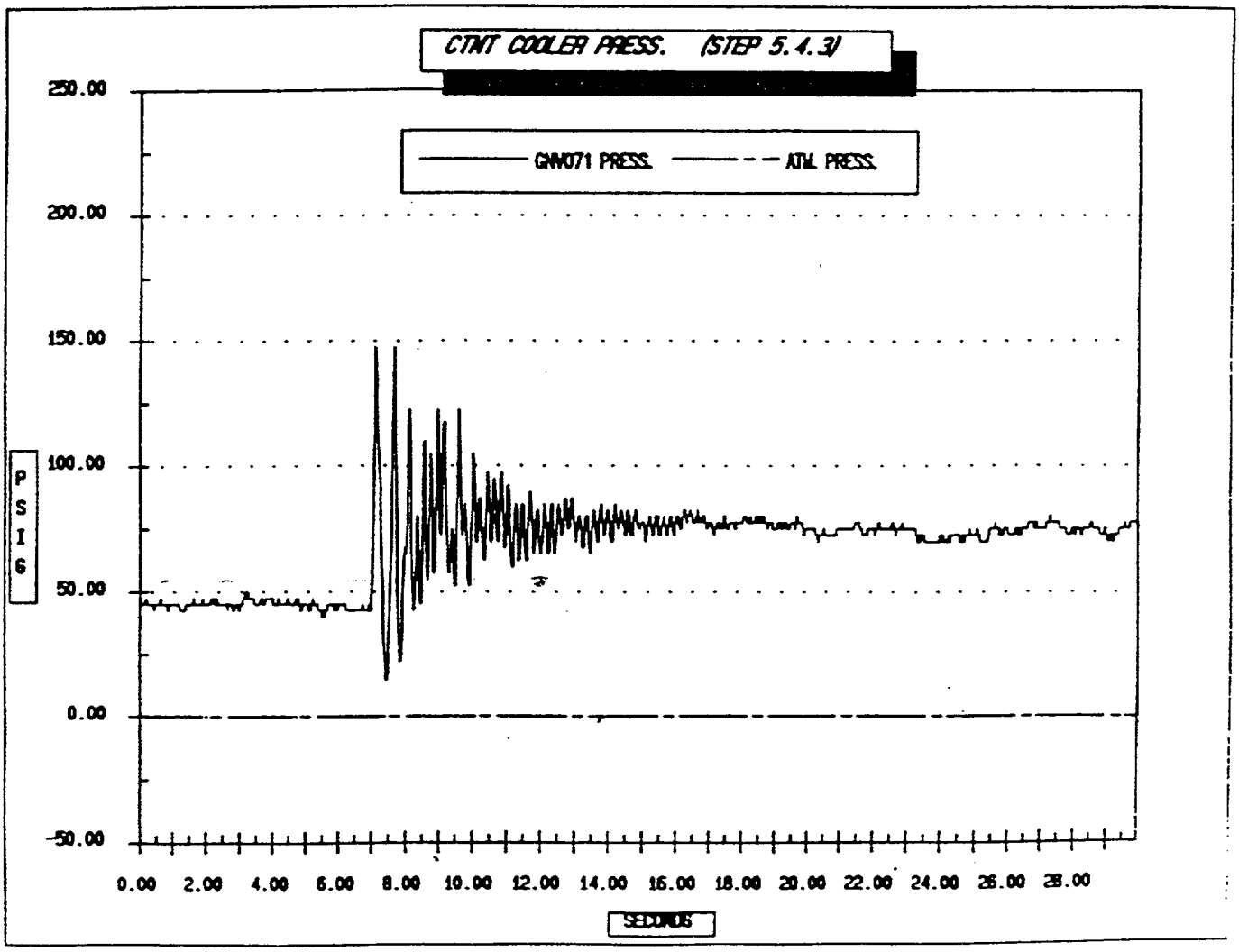
Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E56

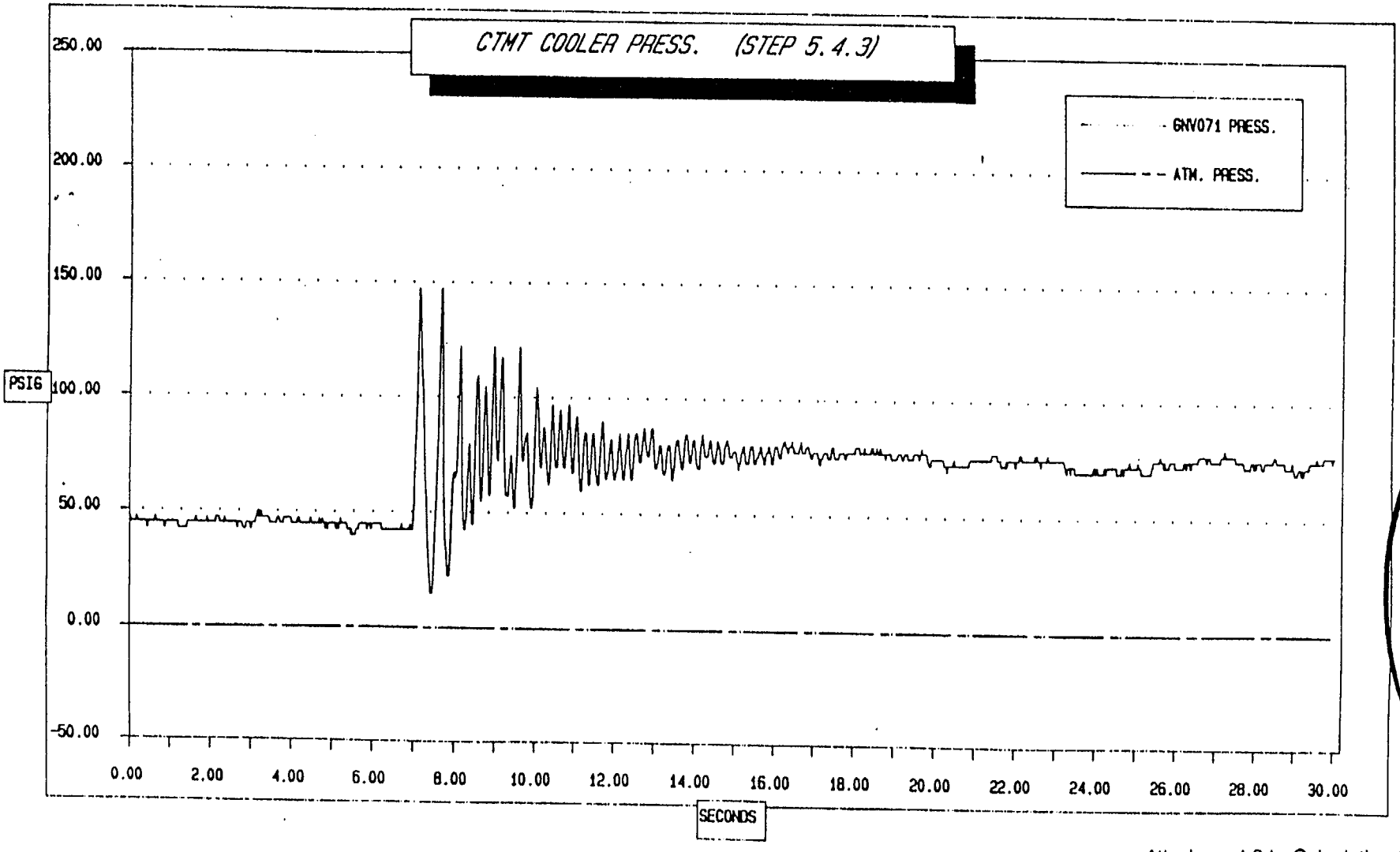
Data collected during ESW Pump start, step 5.4.3, system line-ups. Data shows initial pressure spikes during ESW pump start with service water cross connected to maintain system fill and pressure.

Test: STS KJ-001R STEP 5.4.3	
Run:	0.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	7372.00
Last Sample:	8872.00
Trigger Date:	11-14-1991
Trigger Time:	00:08:11.91
X-Axis Units at First Sample:	147.40
Sample Separation:	0.02
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.59
Y-Axis Min Value:	1.06
Y-Axis Units:	VOLTS

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E157

Attachment 2 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: [illegible] Date: [illegible]
Verified By: TA Date: 5/7/92
Sheet 1 of 3





Altran Report
91227-MR-01 Rev. 3
Att/Appx. E Sh. E58

Attachment 2 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 31

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.19	0.00	47.50
0.02	1.18	0.00	45.00
0.04	1.18	0.00	45.00
0.06	1.18	0.00	45.00
0.08	1.18	0.00	45.00
0.10	1.18	0.00	45.00
0.12	1.18	0.00	45.00
0.14	1.18	0.00	45.00
0.16	1.19	0.00	47.50
0.18	1.19	0.00	47.50
0.20	1.18	0.00	45.00
0.22	1.18	0.00	45.00
0.24	1.18	0.00	45.00
0.26	1.18	0.00	45.00
0.28	1.18	0.00	45.00
0.30	1.18	0.00	45.00
0.32	1.18	0.00	45.00
0.34	1.18	0.00	45.00
0.36	1.18	0.00	45.00
0.38	1.18	0.00	45.00
0.40	1.18	0.00	45.00
0.42	1.17	0.00	42.50
0.44	1.18	0.00	45.00
0.46	1.18	0.00	45.00
0.48	1.18	0.00	45.00
0.50	1.18	0.00	45.00
0.52	1.18	0.00	45.00
0.54	1.18	0.00	45.00
0.56	1.18	0.00	45.00
0.58	1.18	0.00	45.00
0.60	1.19	0.00	47.50
0.62	1.19	0.00	47.50
0.64	1.18	0.00	45.00
0.66	1.18	0.00	45.00
0.68	1.18	0.00	45.00
0.70	1.18	0.00	45.00
0.72	1.18	0.00	45.00
0.74	1.18	0.00	45.00
0.76	1.18	0.00	45.00
0.78	1.18	0.00	45.00
0.80	1.18	0.00	45.00
0.82	1.18	0.00	45.00
0.84	1.17	0.00	42.50
0.86	1.17	0.00	42.50
0.88	1.18	0.00	45.00
0.90	1.18	0.00	45.00
0.92	1.18	0.00	45.00
0.94	1.18	0.00	45.00
0.96	1.18	0.00	45.00
0.98	1.18	0.00	45.00
1.00	1.18	0.00	45.00
1.02	1.18	0.00	45.00

Altran Report
94227-TR-01 Rev. 3
Att/Appx. E Sh E159

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
1.04	1.18	0.00	45.00
1.06	1.18	0.00	45.00
1.08	1.18	0.00	45.00
1.10	1.18	0.00	45.00
1.12	1.18	0.00	45.00
1.14	1.18	0.00	45.00
1.16	1.18	0.00	45.00
1.18	1.18	0.00	45.00
1.20	1.17	0.00	42.50
1.22	1.17	0.00	42.50
1.24	1.17	0.00	42.50
1.26	1.17	0.00	42.50
1.28	1.17	0.00	42.50
1.30	1.17	0.00	42.50
1.32	1.17	0.00	42.50
1.34	1.17	0.00	42.50
1.36	1.17	0.00	42.50
1.38	1.17	0.00	42.50
1.40	1.18	0.00	45.00
1.42	1.18	0.00	45.00
1.44	1.18	0.00	45.00
1.46	1.18	0.00	45.00
1.48	1.18	0.00	45.00
1.50	1.18	0.00	45.00
1.52	1.18	0.00	45.00
1.54	1.18	0.00	45.00
1.56	1.18	0.00	45.00
1.58	1.18	0.00	45.00
1.60	1.19	0.00	47.50
1.62	1.19	0.00	47.50
1.64	1.18	0.00	45.00
1.66	1.18	0.00	45.00
1.68	1.18	0.00	45.00
1.70	1.18	0.00	45.00
1.72	1.18	0.00	45.00
1.74	1.18	0.00	45.00
1.76	1.18	0.00	45.00
1.78	1.18	0.00	45.00
1.80	1.18	0.00	45.00
1.82	1.18	0.00	45.00
1.84	1.18	0.00	45.00
1.86	1.18	0.00	45.00
1.88	1.18	0.00	45.00
1.90	1.19	0.00	47.50
1.92	1.18	0.00	45.00
1.94	1.18	0.00	45.00
1.96	1.18	0.00	45.00
1.98	1.18	0.00	45.00
2.00	1.18	0.00	45.00
2.02	1.18	0.00	45.00
2.04	1.18	0.00	45.00
2.06	1.18	0.00	45.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E160

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.18	0.00	45.00
2.10	1.18	0.00	45.00
2.12	1.19	0.00	47.50
2.14	1.19	0.00	47.50
2.16	1.19	0.00	47.50
2.18	1.19	0.00	47.50
2.20	1.19	0.00	47.50
2.22	1.18	0.00	45.00
2.24	1.18	0.00	45.00
2.26	1.18	0.00	45.00
2.28	1.18	0.00	45.00
2.30	1.18	0.00	45.00
2.32	1.19	0.00	47.50
2.34	1.18	0.00	45.00
2.36	1.18	0.00	45.00
2.38	1.18	0.00	45.00
2.40	1.18	0.00	45.00
2.42	1.18	0.00	45.00
2.44	1.18	0.00	45.00
2.46	1.18	0.00	45.00
2.48	1.18	0.00	45.00
2.50	1.18	0.00	45.00
2.52	1.18	0.00	45.00
2.54	1.18	0.00	45.00
2.56	1.18	0.00	45.00
2.58	1.18	0.00	45.00
2.60	1.18	0.00	45.00
2.62	1.18	0.00	45.00
2.64	1.17	0.00	42.50
2.66	1.18	0.00	45.00
2.68	1.18	0.00	45.00
2.70	1.18	0.00	45.00
2.72	1.18	0.00	45.00
2.74	1.18	0.00	45.00
2.76	1.18	0.00	45.00
2.78	1.17	0.00	42.50
2.80	1.17	0.00	42.50
2.82	1.17	0.00	42.50
2.84	1.17	0.00	42.50
2.86	1.18	0.00	45.00
2.88	1.18	0.00	45.00
2.90	1.18	0.00	45.00
2.92	1.18	0.00	45.00
2.94	1.18	0.00	45.00
2.96	1.18	0.00	45.00
2.98	1.17	0.00	42.50
3.00	1.17	0.00	42.50
3.02	1.18	0.00	45.00
3.04	1.18	0.00	45.00
3.06	1.18	0.00	45.00
3.08	1.18	0.00	45.00
3.10	1.19	0.00	47.50

Altran Report
95227-TR-01 Rev. 3
Att/Appx. E Sh E161

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
3.12	1.19	0.00	47.50
3.14	1.20	0.00	50.00
3.16	1.20	0.00	50.00
3.18	1.19	0.00	47.50
3.20	1.19	0.00	47.50
3.22	1.20	0.00	50.00
3.24	1.20	0.00	50.00
3.26	1.19	0.00	47.50
3.28	1.19	0.00	47.50
3.30	1.19	0.00	47.50
3.32	1.19	0.00	47.50
3.34	1.19	0.00	47.50
3.36	1.19	0.00	47.50
3.38	1.19	0.00	47.50
3.40	1.19	0.00	47.50
3.42	1.19	0.00	47.50
3.44	1.18	0.00	45.00
3.46	1.18	0.00	45.00
3.48	1.18	0.00	45.00
3.50	1.18	0.00	45.00
3.52	1.18	0.00	45.00
3.54	1.18	0.00	45.00
3.56	1.18	0.00	45.00
3.58	1.18	0.00	45.00
3.60	1.18	0.00	45.00
3.62	1.19	0.00	47.50
3.64	1.19	0.00	47.50
3.66	1.19	0.00	47.50
3.68	1.19	0.00	47.50
3.70	1.18	0.00	45.00
3.72	1.18	0.00	45.00
3.74	1.18	0.00	45.00
3.76	1.18	0.00	45.00
3.78	1.19	0.00	47.50
3.80	1.19	0.00	47.50
3.82	1.19	0.00	47.50
3.84	1.19	0.00	47.50
3.86	1.19	0.00	47.50
3.88	1.19	0.00	47.50
3.90	1.19	0.00	47.50
3.92	1.19	0.00	47.50
3.94	1.19	0.00	47.50
3.96	1.19	0.00	47.50
3.98	1.19	0.00	47.50
4.00	1.18	0.00	45.00
4.02	1.18	0.00	45.00
4.04	1.18	0.00	45.00
4.06	1.18	0.00	45.00
4.08	1.18	0.00	45.00
4.10	1.18	0.00	45.00
4.12	1.18	0.00	45.00
4.14	1.19	0.00	47.50

Altran Report
91627-TR-01 Rev. 3
Att/Appx. E Sh E162

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.19	0.00	47.50
4.18	1.19	0.00	47.50
4.20	1.18	0.00	45.00
4.22	1.18	0.00	45.00
4.24	1.18	0.00	45.00
4.26	1.18	0.00	45.00
4.28	1.18	0.00	45.00
4.30	1.18	0.00	45.00
4.32	1.18	0.00	45.00
4.34	1.18	0.00	45.00
4.36	1.18	0.00	45.00
4.38	1.18	0.00	45.00
4.40	1.18	0.00	45.00
4.42	1.18	0.00	45.00
4.44	1.19	0.00	47.50
4.46	1.19	0.00	47.50
4.48	1.18	0.00	45.00
4.50	1.18	0.00	45.00
4.52	1.18	0.00	45.00
4.54	1.18	0.00	45.00
4.56	1.18	0.00	45.00
4.58	1.18	0.00	45.00
4.60	1.18	0.00	45.00
4.62	1.18	0.00	45.00
4.64	1.18	0.00	45.00
4.66	1.18	0.00	45.00
4.68	1.19	0.00	47.50
4.70	1.18	0.00	45.00
4.72	1.18	0.00	45.00
4.74	1.18	0.00	45.00
4.76	1.19	0.00	47.50
4.78	1.18	0.00	45.00
4.80	1.18	0.00	45.00
4.82	1.17	0.00	42.50
4.84	1.18	0.00	45.00
4.86	1.18	0.00	45.00
4.88	1.17	0.00	42.50
4.90	1.18	0.00	45.00
4.92	1.18	0.00	45.00
4.94	1.18	0.00	45.00
4.96	1.18	0.00	45.00
4.98	1.18	0.00	45.00
5.00	1.18	0.00	45.00
5.02	1.18	0.00	45.00
5.04	1.18	0.00	45.00
5.06	1.18	0.00	45.00
5.08	1.17	0.00	42.50
5.10	1.18	0.00	45.00
5.12	1.18	0.00	45.00
5.14	1.17	0.00	42.50
5.16	1.18	0.00	45.00
5.18	1.18	0.00	45.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E163

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
5.20	1.19	0.00	47.50
5.22	1.18	0.00	45.00
5.24	1.18	0.00	45.00
5.26	1.18	0.00	45.00
5.28	1.18	0.00	45.00
5.30	1.18	0.00	45.00
5.32	1.18	0.00	45.00
5.34	1.18	0.00	45.00
5.36	1.17	0.00	42.50
5.38	1.17	0.00	42.50
5.40	1.17	0.00	42.50
5.42	1.17	0.00	42.50
5.44	1.17	0.00	42.50
5.46	1.16	0.00	40.00
5.48	1.17	0.00	42.50
5.50	1.16	0.00	40.00
5.52	1.16	0.00	40.00
5.54	1.16	0.00	40.00
5.56	1.16	0.00	40.00
5.58	1.17	0.00	42.50
5.60	1.17	0.00	42.50
5.62	1.17	0.00	42.50
5.64	1.17	0.00	42.50
5.66	1.18	0.00	45.00
5.68	1.18	0.00	45.00
5.70	1.18	0.00	45.00
5.72	1.18	0.00	45.00
5.74	1.18	0.00	45.00
5.76	1.18	0.00	45.00
5.78	1.18	0.00	45.00
5.80	1.18	0.00	45.00
5.82	1.18	0.00	45.00
5.84	1.18	0.00	45.00
5.86	1.17	0.00	42.50
5.88	1.18	0.00	45.00
5.90	1.18	0.00	45.00
5.92	1.18	0.00	45.00
5.94	1.18	0.00	45.00
5.96	1.17	0.00	42.50
5.98	1.18	0.00	45.00
6.00	1.18	0.00	45.00
6.02	1.18	0.00	45.00
6.04	1.18	0.00	45.00
6.06	1.18	0.00	45.00
6.08	1.18	0.00	45.00
6.10	1.18	0.00	45.00
6.12	1.18	0.00	45.00
6.14	1.18	0.00	45.00
6.16	1.18	0.00	45.00
6.18	1.18	0.00	45.00
6.20	1.18	0.00	45.00
6.22	1.17	0.00	42.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E164

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.17	0.00	42.50
6.26	1.17	0.00	42.50
6.28	1.17	0.00	42.50
6.30	1.17	0.00	42.50
6.32	1.17	0.00	42.50
6.34	1.17	0.00	42.50
6.36	1.17	0.00	42.50
6.38	1.17	0.00	42.50
6.40	1.17	0.00	42.50
6.42	1.17	0.00	42.50
6.44	1.17	0.00	42.50
6.46	1.17	0.00	42.50
6.48	1.17	0.00	42.50
6.50	1.17	0.00	42.50
6.52	1.17	0.00	42.50
6.54	1.17	0.00	42.50
6.56	1.17	0.00	42.50
6.58	1.17	0.00	42.50
6.60	1.17	0.00	42.50
6.62	1.17	0.00	42.50
6.64	1.17	0.00	42.50
6.66	1.17	0.00	42.50
6.68	1.17	0.00	42.50
6.70	1.17	0.00	42.50
6.72	1.18	0.00	45.00
6.74	1.17	0.00	42.50
6.76	1.17	0.00	42.50
6.78	1.17	0.00	42.50
6.80	1.17	0.00	42.50
6.82	1.17	0.00	42.50
6.84	1.17	0.00	42.50
6.86	1.17	0.00	42.50
6.88	1.17	0.00	42.50
6.90	1.17	0.00	42.50
6.92	1.18	0.00	45.00
6.94	1.17	0.00	42.50
6.96	1.17	0.00	42.50
6.98	1.17	0.00	42.50
7.00	1.19	0.00	47.50
7.02	1.22	0.00	55.00
7.04	1.28	0.00	70.00
7.06	1.39	0.00	97.50
7.08	1.51	0.00	127.50
7.10	1.59	0.00	147.50
7.12	1.58	0.00	145.00
7.14	1.54	0.00	135.00
7.16	1.49	0.00	122.50
7.18	1.45	0.00	112.50
7.20	1.43	0.00	107.50
7.22	1.41	0.00	102.50
7.24	1.37	0.00	92.50
7.26	1.32	0.00	80.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E165

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
7.28	1.27	0.00	67.50
7.30	1.23	0.00	57.50
7.32	1.19	0.00	47.50
7.34	1.15	0.00	37.50
7.36	1.12	0.00	30.00
7.38	1.10	0.00	25.00
7.40	1.08	0.00	20.00
7.42	1.06	0.00	15.00
7.44	1.06	0.00	15.00
7.46	1.06	0.00	15.00
7.48	1.07	0.00	17.50
7.50	1.10	0.00	25.00
7.52	1.14	0.00	35.00
7.54	1.20	0.00	50.00
7.56	1.24	0.00	60.00
7.58	1.29	0.00	72.50
7.60	1.35	0.00	87.50
7.62	1.44	0.00	110.00
7.64	1.54	0.00	135.00
7.66	1.59	0.00	147.50
7.68	1.55	0.00	137.50
7.70	1.47	0.00	117.50
7.72	1.38	0.00	95.00
7.74	1.29	0.00	72.50
7.76	1.22	0.00	55.00
7.78	1.16	0.00	40.00
7.80	1.13	0.00	32.50
7.82	1.10	0.00	25.00
7.84	1.09	0.00	22.50
7.86	1.09	0.00	22.50
7.88	1.10	0.00	25.00
7.90	1.13	0.00	32.50
7.92	1.17	0.00	42.50
7.94	1.22	0.00	55.00
7.96	1.25	0.00	62.50
7.98	1.27	0.00	67.50
8.00	1.27	0.00	67.50
8.02	1.26	0.00	65.00
8.04	1.27	0.00	67.50
8.06	1.31	0.00	77.50
8.08	1.38	0.00	95.00
8.10	1.46	0.00	115.00
8.12	1.49	0.00	122.50
8.14	1.45	0.00	112.50
8.16	1.38	0.00	95.00
8.18	1.30	0.00	75.00
8.20	1.23	0.00	57.50
8.22	1.19	0.00	47.50
8.24	1.18	0.00	45.00
8.26	1.17	0.00	42.50
8.28	1.19	0.00	47.50
8.30	1.22	0.00	55.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E166

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.26	0.00	65.00
8.34	1.31	0.00	77.50
8.36	1.32	0.00	80.00
8.38	1.29	0.00	72.50
8.40	1.26	0.00	65.00
8.42	1.22	0.00	55.00
8.44	1.19	0.00	47.50
8.46	1.18	0.00	45.00
8.48	1.20	0.00	50.00
8.50	1.26	0.00	65.00
8.52	1.35	0.00	87.50
8.54	1.43	0.00	107.50
8.56	1.44	0.00	110.00
8.58	1.41	0.00	102.50
8.60	1.34	0.00	85.00
8.62	1.28	0.00	70.00
8.64	1.24	0.00	60.00
8.66	1.22	0.00	55.00
8.68	1.23	0.00	57.50
8.70	1.27	0.00	67.50
8.72	1.34	0.00	85.00
8.74	1.40	0.00	100.00
8.76	1.42	0.00	105.00
8.78	1.40	0.00	100.00
8.80	1.34	0.00	85.00
8.82	1.29	0.00	72.50
8.84	1.25	0.00	62.50
8.86	1.23	0.00	57.50
8.88	1.24	0.00	60.00
8.90	1.30	0.00	75.00
8.92	1.39	0.00	97.50
8.94	1.47	0.00	117.50
8.96	1.49	0.00	122.50
8.98	1.46	0.00	115.00
9.00	1.40	0.00	100.00
9.02	1.34	0.00	85.00
9.04	1.30	0.00	75.00
9.06	1.29	0.00	72.50
9.08	1.32	0.00	80.00
9.10	1.37	0.00	92.50
9.12	1.44	0.00	110.00
9.14	1.47	0.00	117.50
9.16	1.47	0.00	117.50
9.18	1.43	0.00	107.50
9.20	1.38	0.00	95.00
9.22	1.32	0.00	80.00
9.24	1.28	0.00	70.00
9.26	1.25	0.00	62.50
9.28	1.23	0.00	57.50
9.30	1.23	0.00	57.50
9.32	1.23	0.00	57.50
9.34	1.25	0.00	62.50

Altran Report
91622-TR-01 Rev. 3
Att./Appx. E Sh E16

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
9.36	1.27	0.00	67.50
9.38	1.29	0.00	72.50
9.40	1.30	0.00	75.00
9.42	1.29	0.00	72.50
9.44	1.26	0.00	65.00
9.46	1.23	0.00	57.50
9.48	1.21	0.00	52.50
9.50	1.21	0.00	52.50
9.52	1.24	0.00	60.00
9.54	1.30	0.00	75.00
9.56	1.40	0.00	100.00
9.58	1.48	0.00	120.00
9.60	1.49	0.00	122.50
9.62	1.44	0.00	110.00
9.64	1.38	0.00	95.00
9.66	1.33	0.00	82.50
9.68	1.30	0.00	75.00
9.70	1.29	0.00	72.50
9.72	1.30	0.00	75.00
9.74	1.32	0.00	80.00
9.76	1.33	0.00	82.50
9.78	1.34	0.00	85.00
9.80	1.32	0.00	80.00
9.82	1.29	0.00	72.50
9.84	1.26	0.00	65.00
9.86	1.23	0.00	57.50
9.88	1.22	0.00	55.00
9.90	1.21	0.00	52.50
9.92	1.22	0.00	55.00
9.94	1.23	0.00	57.50
9.96	1.28	0.00	70.00
9.98	1.33	0.00	82.50
10.00	1.39	0.00	97.50
10.02	1.42	0.00	105.00
10.04	1.41	0.00	102.50
10.06	1.37	0.00	92.50
10.08	1.33	0.00	82.50
10.10	1.29	0.00	72.50
10.12	1.28	0.00	70.00
10.14	1.28	0.00	70.00
10.16	1.30	0.00	75.00
10.18	1.32	0.00	80.00
10.20	1.35	0.00	87.50
10.22	1.35	0.00	87.50
10.24	1.34	0.00	85.00
10.26	1.32	0.00	80.00
10.28	1.30	0.00	75.00
10.30	1.27	0.00	67.50
10.32	1.26	0.00	65.00
10.34	1.25	0.00	62.50
10.36	1.26	0.00	65.00
10.38	1.29	0.00	72.50

Altran Report
96227-TR.01 Rev. 3
Att./Appx. E Sh E168

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	1.34	0.00	85.00
10.42	1.38	0.00	95.00
10.44	1.39	0.00	97.50
10.46	1.37	0.00	92.50
10.48	1.34	0.00	85.00
10.50	1.32	0.00	80.00
10.52	1.29	0.00	72.50
10.54	1.28	0.00	70.00
10.56	1.28	0.00	70.00
10.58	1.31	0.00	77.50
10.60	1.34	0.00	85.00
10.62	1.37	0.00	92.50
10.64	1.38	0.00	95.00
10.66	1.36	0.00	90.00
10.68	1.34	0.00	85.00
10.70	1.31	0.00	77.50
10.72	1.29	0.00	72.50
10.74	1.28	0.00	70.00
10.76	1.28	0.00	70.00
10.78	1.30	0.00	75.00
10.80	1.34	0.00	85.00
10.82	1.37	0.00	92.50
10.84	1.39	0.00	97.50
10.86	1.38	0.00	95.00
10.88	1.35	0.00	87.50
10.90	1.32	0.00	80.00
10.92	1.29	0.00	72.50
10.94	1.27	0.00	67.50
10.96	1.27	0.00	67.50
10.98	1.29	0.00	72.50
11.00	1.32	0.00	80.00
11.02	1.35	0.00	87.50
11.04	1.37	0.00	92.50
11.06	1.36	0.00	90.00
11.08	1.33	0.00	82.50
11.10	1.30	0.00	75.00
11.12	1.27	0.00	67.50
11.14	1.25	0.00	62.50
11.16	1.24	0.00	60.00
11.18	1.24	0.00	60.00
11.20	1.26	0.00	65.00
11.22	1.29	0.00	72.50
11.24	1.32	0.00	80.00
11.26	1.34	0.00	85.00
11.28	1.34	0.00	85.00
11.30	1.33	0.00	82.50
11.32	1.30	0.00	75.00
11.34	1.27	0.00	67.50
11.36	1.25	0.00	62.50
11.38	1.25	0.00	62.50
11.40	1.27	0.00	67.50
11.42	1.29	0.00	72.50

Altran Report
96227-MR-01 Rev. 3
Att./Appx. E Sh E169

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
11.44	1.32	0.00	80.00
11.46	1.34	0.00	85.00
11.48	1.34	0.00	85.00
11.50	1.33	0.00	82.50
11.52	1.31	0.00	77.50
11.54	1.28	0.00	70.00
11.56	1.26	0.00	65.00
11.58	1.25	0.00	62.50
11.60	1.25	0.00	62.50
11.62	1.28	0.00	70.00
11.64	1.31	0.00	77.50
11.66	1.34	0.00	85.00
11.68	1.36	0.00	90.00
11.70	1.36	0.00	90.00
11.72	1.34	0.00	85.00
11.74	1.32	0.00	80.00
11.76	1.29	0.00	72.50
11.78	1.27	0.00	67.50
11.80	1.26	0.00	65.00
11.82	1.27	0.00	67.50
11.84	1.28	0.00	70.00
11.86	1.30	0.00	75.00
11.88	1.32	0.00	80.00
11.90	1.33	0.00	82.50
11.92	1.33	0.00	82.50
11.94	1.31	0.00	77.50
11.96	1.29	0.00	72.50
11.98	1.27	0.00	67.50
12.00	1.26	0.00	65.00
12.02	1.26	0.00	65.00
12.04	1.27	0.00	67.50
12.06	1.28	0.00	70.00
12.08	1.31	0.00	77.50
12.10	1.33	0.00	82.50
12.12	1.34	0.00	85.00
12.14	1.33	0.00	82.50
12.16	1.31	0.00	77.50
12.18	1.29	0.00	72.50
12.20	1.27	0.00	67.50
12.22	1.26	0.00	65.00
12.24	1.26	0.00	65.00
12.26	1.27	0.00	67.50
12.28	1.30	0.00	75.00
12.30	1.32	0.00	80.00
12.32	1.34	0.00	85.00
12.34	1.34	0.00	85.00
12.36	1.32	0.00	80.00
12.38	1.29	0.00	72.50
12.40	1.27	0.00	67.50
12.42	1.26	0.00	65.00
12.44	1.26	0.00	65.00
12.46	1.28	0.00	70.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E-10

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	1.30	0.00	75.00
12.50	1.33	0.00	82.50
12.52	1.34	0.00	85.00
12.54	1.34	0.00	85.00
12.56	1.33	0.00	82.50
12.58	1.31	0.00	77.50
12.60	1.30	0.00	75.00
12.62	1.29	0.00	72.50
12.64	1.29	0.00	72.50
12.66	1.30	0.00	75.00
12.68	1.32	0.00	80.00
12.70	1.34	0.00	85.00
12.72	1.35	0.00	87.50
12.74	1.35	0.00	87.50
12.76	1.33	0.00	82.50
12.78	1.32	0.00	80.00
12.80	1.30	0.00	75.00
12.82	1.30	0.00	75.00
12.84	1.30	0.00	75.00
12.86	1.32	0.00	80.00
12.88	1.33	0.00	82.50
12.90	1.35	0.00	87.50
12.92	1.35	0.00	87.50
12.94	1.35	0.00	87.50
12.96	1.33	0.00	82.50
12.98	1.31	0.00	77.50
13.00	1.29	0.00	72.50
13.02	1.28	0.00	70.00
13.04	1.28	0.00	70.00
13.06	1.29	0.00	72.50
13.08	1.30	0.00	75.00
13.10	1.32	0.00	80.00
13.12	1.32	0.00	80.00
13.14	1.32	0.00	80.00
13.16	1.31	0.00	77.50
13.18	1.30	0.00	75.00
13.20	1.28	0.00	70.00
13.22	1.27	0.00	67.50
13.24	1.27	0.00	67.50
13.26	1.27	0.00	67.50
13.28	1.28	0.00	70.00
13.30	1.30	0.00	75.00
13.32	1.32	0.00	80.00
13.34	1.32	0.00	80.00
13.36	1.32	0.00	80.00
13.38	1.31	0.00	77.50
13.40	1.29	0.00	72.50
13.42	1.27	0.00	67.50
13.44	1.26	0.00	65.00
13.46	1.27	0.00	67.50
13.48	1.28	0.00	70.00
13.50	1.30	0.00	75.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh EM1

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
13.52	1.32	0.00	80.00
13.54	1.33	0.00	82.50
13.56	1.33	0.00	82.50
13.58	1.32	0.00	80.00
13.60	1.31	0.00	77.50
13.62	1.30	0.00	75.00
13.64	1.29	0.00	72.50
13.66	1.28	0.00	70.00
13.68	1.28	0.00	70.00
13.70	1.29	0.00	72.50
13.72	1.31	0.00	77.50
13.74	1.33	0.00	82.50
13.76	1.34	0.00	85.00
13.78	1.34	0.00	85.00
13.80	1.33	0.00	82.50
13.82	1.31	0.00	77.50
13.84	1.30	0.00	75.00
13.86	1.29	0.00	72.50
13.88	1.29	0.00	72.50
13.90	1.30	0.00	75.00
13.92	1.31	0.00	77.50
13.94	1.33	0.00	82.50
13.96	1.33	0.00	82.50
13.98	1.33	0.00	82.50
14.00	1.32	0.00	80.00
14.02	1.31	0.00	77.50
14.04	1.29	0.00	72.50
14.06	1.28	0.00	70.00
14.08	1.28	0.00	70.00
14.10	1.28	0.00	70.00
14.12	1.30	0.00	75.00
14.14	1.32	0.00	80.00
14.16	1.33	0.00	82.50
14.18	1.34	0.00	85.00
14.20	1.33	0.00	82.50
14.22	1.32	0.00	80.00
14.24	1.31	0.00	77.50
14.26	1.30	0.00	75.00
14.28	1.30	0.00	75.00
14.30	1.30	0.00	75.00
14.32	1.31	0.00	77.50
14.34	1.32	0.00	80.00
14.36	1.33	0.00	82.50
14.38	1.33	0.00	82.50
14.40	1.32	0.00	80.00
14.42	1.31	0.00	77.50
14.44	1.30	0.00	75.00
14.46	1.29	0.00	72.50
14.48	1.29	0.00	72.50
14.50	1.29	0.00	72.50
14.52	1.30	0.00	75.00
14.54	1.32	0.00	80.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh EM

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	1.33	0.00	82.50
14.58	1.32	0.00	80.00
14.60	1.32	0.00	80.00
14.62	1.31	0.00	77.50
14.64	1.29	0.00	72.50
14.66	1.29	0.00	72.50
14.68	1.29	0.00	72.50
14.70	1.29	0.00	72.50
14.72	1.30	0.00	75.00
14.74	1.32	0.00	80.00
14.76	1.32	0.00	80.00
14.78	1.33	0.00	82.50
14.80	1.33	0.00	82.50
14.82	1.32	0.00	80.00
14.84	1.31	0.00	77.50
14.86	1.30	0.00	75.00
14.88	1.30	0.00	75.00
14.90	1.30	0.00	75.00
14.92	1.30	0.00	75.00
14.94	1.31	0.00	77.50
14.96	1.31	0.00	77.50
14.98	1.31	0.00	77.50
15.00	1.31	0.00	77.50
15.02	1.31	0.00	77.50
15.04	1.30	0.00	75.00
15.06	1.29	0.00	72.50
15.08	1.28	0.00	70.00
15.10	1.29	0.00	72.50
15.12	1.29	0.00	72.50
15.14	1.30	0.00	75.00
15.16	1.31	0.00	77.50
15.18	1.31	0.00	77.50
15.20	1.32	0.00	80.00
15.22	1.32	0.00	80.00
15.24	1.31	0.00	77.50
15.26	1.30	0.00	75.00
15.28	1.29	0.00	72.50
15.30	1.29	0.00	72.50
15.32	1.29	0.00	72.50
15.34	1.30	0.00	75.00
15.36	1.31	0.00	77.50
15.38	1.32	0.00	80.00
15.40	1.32	0.00	80.00
15.42	1.32	0.00	80.00
15.44	1.32	0.00	80.00
15.46	1.31	0.00	77.50
15.48	1.29	0.00	72.50
15.50	1.29	0.00	72.50
15.52	1.29	0.00	72.50
15.54	1.30	0.00	75.00
15.56	1.30	0.00	75.00
15.58	1.31	0.00	77.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E173

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
15.60	1.31	0.00	77.50
15.62	1.32	0.00	80.00
15.64	1.32	0.00	80.00
15.66	1.31	0.00	77.50
15.68	1.30	0.00	75.00
15.70	1.30	0.00	75.00
15.72	1.29	0.00	72.50
15.74	1.29	0.00	72.50
15.76	1.30	0.00	75.00
15.78	1.31	0.00	77.50
15.80	1.31	0.00	77.50
15.82	1.32	0.00	80.00
15.84	1.32	0.00	80.00
15.86	1.31	0.00	77.50
15.88	1.31	0.00	77.50
15.90	1.30	0.00	75.00
15.92	1.29	0.00	72.50
15.94	1.29	0.00	72.50
15.96	1.30	0.00	75.00
15.98	1.31	0.00	77.50
16.00	1.32	0.00	80.00
16.02	1.32	0.00	80.00
16.04	1.32	0.00	80.00
16.06	1.32	0.00	80.00
16.08	1.31	0.00	77.50
16.10	1.30	0.00	75.00
16.12	1.30	0.00	75.00
16.14	1.30	0.00	75.00
16.16	1.31	0.00	77.50
16.18	1.32	0.00	80.00
16.20	1.32	0.00	80.00
16.22	1.33	0.00	82.50
16.24	1.33	0.00	82.50
16.26	1.33	0.00	82.50
16.28	1.32	0.00	80.00
16.30	1.32	0.00	80.00
16.32	1.31	0.00	77.50
16.34	1.32	0.00	80.00
16.36	1.32	0.00	80.00
16.38	1.32	0.00	80.00
16.40	1.32	0.00	80.00
16.42	1.33	0.00	82.50
16.44	1.32	0.00	80.00
16.46	1.32	0.00	80.00
16.48	1.31	0.00	77.50
16.50	1.31	0.00	77.50
16.52	1.31	0.00	77.50
16.54	1.31	0.00	77.50
16.56	1.31	0.00	77.50
16.58	1.31	0.00	77.50
16.60	1.32	0.00	80.00
16.62	1.32	0.00	80.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E174

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	1.33	0.00	82.50
16.66	1.32	0.00	80.00
16.68	1.31	0.00	77.50
16.70	1.31	0.00	77.50
16.72	1.31	0.00	77.50
16.74	1.31	0.00	77.50
16.76	1.31	0.00	77.50
16.78	1.32	0.00	80.00
16.80	1.32	0.00	80.00
16.82	1.32	0.00	80.00
16.84	1.32	0.00	80.00
16.86	1.31	0.00	77.50
16.88	1.31	0.00	77.50
16.90	1.30	0.00	75.00
16.92	1.30	0.00	75.00
16.94	1.30	0.00	75.00
16.96	1.31	0.00	77.50
16.98	1.31	0.00	77.50
17.00	1.31	0.00	77.50
17.02	1.31	0.00	77.50
17.04	1.31	0.00	77.50
17.06	1.31	0.00	77.50
17.08	1.30	0.00	75.00
17.10	1.30	0.00	75.00
17.12	1.29	0.00	72.50
17.14	1.29	0.00	72.50
17.16	1.30	0.00	75.00
17.18	1.30	0.00	75.00
17.20	1.30	0.00	75.00
17.22	1.31	0.00	77.50
17.24	1.31	0.00	77.50
17.26	1.31	0.00	77.50
17.28	1.31	0.00	77.50
17.30	1.31	0.00	77.50
17.32	1.30	0.00	75.00
17.34	1.30	0.00	75.00
17.36	1.30	0.00	75.00
17.38	1.30	0.00	75.00
17.40	1.31	0.00	77.50
17.42	1.32	0.00	80.00
17.44	1.32	0.00	80.00
17.46	1.32	0.00	80.00
17.48	1.31	0.00	77.50
17.50	1.30	0.00	75.00
17.52	1.30	0.00	75.00
17.54	1.30	0.00	75.00
17.56	1.30	0.00	75.00
17.58	1.30	0.00	75.00
17.60	1.31	0.00	77.50
17.62	1.31	0.00	77.50
17.64	1.31	0.00	77.50
17.66	1.31	0.00	77.50

Altran Report
96227-NR-01 Rev. 3
Att/Appx. E Sh E17

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
17.68	1.31	0.00	77.50
17.70	1.31	0.00	77.50
17.72	1.31	0.00	77.50
17.74	1.31	0.00	77.50
17.76	1.30	0.00	75.00
17.78	1.30	0.00	75.00
17.80	1.31	0.00	77.50
17.82	1.31	0.00	77.50
17.84	1.31	0.00	77.50
17.86	1.31	0.00	77.50
17.88	1.31	0.00	77.50
17.90	1.31	0.00	77.50
17.92	1.31	0.00	77.50
17.94	1.31	0.00	77.50
17.96	1.31	0.00	77.50
17.98	1.31	0.00	77.50
18.00	1.31	0.00	77.50
18.02	1.32	0.00	80.00
18.04	1.32	0.00	80.00
18.06	1.32	0.00	80.00
18.08	1.32	0.00	80.00
18.10	1.32	0.00	80.00
18.12	1.31	0.00	77.50
18.14	1.31	0.00	77.50
18.16	1.31	0.00	77.50
18.18	1.31	0.00	77.50
18.20	1.31	0.00	77.50
18.22	1.31	0.00	77.50
18.24	1.32	0.00	80.00
18.26	1.31	0.00	77.50
18.28	1.31	0.00	77.50
18.30	1.31	0.00	77.50
18.32	1.31	0.00	77.50
18.34	1.31	0.00	77.50
18.36	1.31	0.00	77.50
18.38	1.31	0.00	77.50
18.40	1.32	0.00	80.00
18.42	1.32	0.00	80.00
18.44	1.32	0.00	80.00
18.46	1.31	0.00	77.50
18.48	1.31	0.00	77.50
18.50	1.31	0.00	77.50
18.52	1.31	0.00	77.50
18.54	1.32	0.00	80.00
18.56	1.31	0.00	77.50
18.58	1.31	0.00	77.50
18.60	1.31	0.00	77.50
18.62	1.32	0.00	80.00
18.64	1.31	0.00	77.50
18.66	1.31	0.00	77.50
18.68	1.31	0.00	77.50
18.70	1.31	0.00	77.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E176

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
18.72	1.31	0.00	77.50
18.74	1.31	0.00	77.50
18.76	1.30	0.00	75.00
18.78	1.31	0.00	77.50
18.80	1.31	0.00	77.50
18.82	1.31	0.00	77.50
18.84	1.31	0.00	77.50
18.86	1.31	0.00	77.50
18.88	1.31	0.00	77.50
18.90	1.30	0.00	75.00
18.92	1.30	0.00	75.00
18.94	1.30	0.00	75.00
18.96	1.30	0.00	75.00
18.98	1.30	0.00	75.00
19.00	1.30	0.00	75.00
19.02	1.30	0.00	75.00
19.04	1.30	0.00	75.00
19.06	1.31	0.00	77.50
19.08	1.31	0.00	77.50
19.10	1.31	0.00	77.50
19.12	1.31	0.00	77.50
19.14	1.31	0.00	77.50
19.16	1.30	0.00	75.00
19.18	1.30	0.00	75.00
19.20	1.30	0.00	75.00
19.22	1.31	0.00	77.50
19.24	1.31	0.00	77.50
19.26	1.31	0.00	77.50
19.28	1.31	0.00	77.50
19.30	1.31	0.00	77.50
19.32	1.30	0.00	75.00
19.34	1.30	0.00	75.00
19.36	1.30	0.00	75.00
19.38	1.30	0.00	75.00
19.40	1.30	0.00	75.00
19.42	1.30	0.00	75.00
19.44	1.31	0.00	77.50
19.46	1.31	0.00	77.50
19.48	1.31	0.00	77.50
19.50	1.31	0.00	77.50
19.52	1.31	0.00	77.50
19.54	1.31	0.00	77.50
19.56	1.31	0.00	77.50
19.58	1.30	0.00	75.00
19.60	1.31	0.00	77.50
19.62	1.31	0.00	77.50
19.64	1.32	0.00	80.00
19.66	1.31	0.00	77.50
19.68	1.31	0.00	77.50
19.70	1.31	0.00	77.50
19.72	1.31	0.00	77.50
19.74	1.31	0.00	77.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh EM

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
19.76	1.31	0.00	77.50
19.78	1.31	0.00	77.50
19.80	1.30	0.00	75.00
19.82	1.29	0.00	72.50
19.84	1.29	0.00	72.50
19.86	1.29	0.00	72.50
19.88	1.30	0.00	75.00
19.90	1.30	0.00	75.00
19.92	1.30	0.00	75.00
19.94	1.30	0.00	75.00
19.96	1.30	0.00	75.00
19.98	1.30	0.00	75.00
20.00	1.30	0.00	75.00
20.02	1.30	0.00	75.00
20.04	1.30	0.00	75.00
20.06	1.30	0.00	75.00
20.08	1.30	0.00	75.00
20.10	1.30	0.00	75.00
20.12	1.30	0.00	75.00
20.14	1.30	0.00	75.00
20.16	1.30	0.00	75.00
20.18	1.30	0.00	75.00
20.20	1.29	0.00	72.50
20.22	1.29	0.00	72.50
20.24	1.29	0.00	72.50
20.26	1.29	0.00	72.50
20.28	1.28	0.00	70.00
20.30	1.29	0.00	72.50
20.32	1.29	0.00	72.50
20.34	1.29	0.00	72.50
20.36	1.29	0.00	72.50
20.38	1.29	0.00	72.50
20.40	1.29	0.00	72.50
20.42	1.29	0.00	72.50
20.44	1.30	0.00	75.00
20.46	1.30	0.00	75.00
20.48	1.29	0.00	72.50
20.50	1.29	0.00	72.50
20.52	1.29	0.00	72.50
20.54	1.29	0.00	72.50
20.56	1.29	0.00	72.50
20.58	1.29	0.00	72.50
20.60	1.29	0.00	72.50
20.62	1.29	0.00	72.50
20.64	1.29	0.00	72.50
20.66	1.29	0.00	72.50
20.68	1.29	0.00	72.50
20.70	1.29	0.00	72.50
20.72	1.29	0.00	72.50
20.74	1.29	0.00	72.50
20.76	1.29	0.00	72.50
20.78	1.29	0.00	72.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E178

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	1.29	0.00	72.50
20.82	1.29	0.00	72.50
20.84	1.30	0.00	75.00
20.86	1.30	0.00	75.00
20.88	1.30	0.00	75.00
20.90	1.30	0.00	75.00
20.92	1.30	0.00	75.00
20.94	1.30	0.00	75.00
20.96	1.30	0.00	75.00
20.98	1.30	0.00	75.00
21.00	1.30	0.00	75.00
21.02	1.30	0.00	75.00
21.04	1.30	0.00	75.00
21.06	1.30	0.00	75.00
21.08	1.30	0.00	75.00
21.10	1.30	0.00	75.00
21.12	1.30	0.00	75.00
21.14	1.30	0.00	75.00
21.16	1.30	0.00	75.00
21.18	1.30	0.00	75.00
21.20	1.30	0.00	75.00
21.22	1.30	0.00	75.00
21.24	1.30	0.00	75.00
21.26	1.30	0.00	75.00
21.28	1.30	0.00	75.00
21.30	1.30	0.00	75.00
21.32	1.30	0.00	75.00
21.34	1.30	0.00	75.00
21.36	1.30	0.00	75.00
21.38	1.31	0.00	77.50
21.40	1.31	0.00	77.50
21.42	1.31	0.00	77.50
21.44	1.31	0.00	77.50
21.46	1.31	0.00	77.50
21.48	1.31	0.00	77.50
21.50	1.31	0.00	77.50
21.52	1.31	0.00	77.50
21.54	1.30	0.00	75.00
21.56	1.30	0.00	75.00
21.58	1.30	0.00	75.00
21.60	1.30	0.00	75.00
21.62	1.29	0.00	72.50
21.64	1.29	0.00	72.50
21.66	1.29	0.00	72.50
21.68	1.29	0.00	72.50
21.70	1.29	0.00	72.50
21.72	1.29	0.00	72.50
21.74	1.29	0.00	72.50
21.76	1.30	0.00	75.00
21.78	1.29	0.00	72.50
21.80	1.30	0.00	75.00
21.82	1.30	0.00	75.00

Altran Report
96227-NR-01 Rev. 3
Att/Appx. E Sh E179

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
21.84	1.30	0.00	75.00
21.86	1.30	0.00	75.00
21.88	1.30	0.00	75.00
21.90	1.30	0.00	75.00
21.92	1.30	0.00	75.00
21.94	1.30	0.00	75.00
21.96	1.30	0.00	75.00
21.98	1.29	0.00	72.50
22.00	1.29	0.00	72.50
22.02	1.30	0.00	75.00
22.04	1.30	0.00	75.00
22.06	1.30	0.00	75.00
22.08	1.31	0.00	77.50
22.10	1.31	0.00	77.50
22.12	1.31	0.00	77.50
22.14	1.30	0.00	75.00
22.16	1.30	0.00	75.00
22.18	1.30	0.00	75.00
22.20	1.30	0.00	75.00
22.22	1.30	0.00	75.00
22.24	1.30	0.00	75.00
22.26	1.30	0.00	75.00
22.28	1.30	0.00	75.00
22.30	1.30	0.00	75.00
22.32	1.30	0.00	75.00
22.34	1.30	0.00	75.00
22.36	1.30	0.00	75.00
22.38	1.30	0.00	75.00
22.40	1.30	0.00	75.00
22.42	1.30	0.00	75.00
22.44	1.30	0.00	75.00
22.46	1.30	0.00	75.00
22.48	1.31	0.00	77.50
22.50	1.30	0.00	75.00
22.52	1.31	0.00	77.50
22.54	1.31	0.00	77.50
22.56	1.30	0.00	75.00
22.58	1.30	0.00	75.00
22.60	1.30	0.00	75.00
22.62	1.29	0.00	72.50
22.64	1.30	0.00	75.00
22.66	1.30	0.00	75.00
22.68	1.30	0.00	75.00
22.70	1.30	0.00	75.00
22.72	1.30	0.00	75.00
22.74	1.30	0.00	75.00
22.76	1.30	0.00	75.00
22.78	1.30	0.00	75.00
22.80	1.31	0.00	77.50
22.82	1.30	0.00	75.00
22.84	1.30	0.00	75.00
22.86	1.30	0.00	75.00

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh E180

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.88	1.30	0.00	75.00
22.90	1.30	0.00	75.00
22.92	1.30	0.00	75.00
22.94	1.30	0.00	75.00
22.96	1.30	0.00	75.00
22.98	1.30	0.00	75.00
23.00	1.30	0.00	75.00
23.02	1.30	0.00	75.00
23.04	1.30	0.00	75.00
23.06	1.30	0.00	75.00
23.08	1.30	0.00	75.00
23.10	1.30	0.00	75.00
23.12	1.30	0.00	75.00
23.14	1.30	0.00	75.00
23.16	1.30	0.00	75.00
23.18	1.30	0.00	75.00
23.20	1.30	0.00	75.00
23.22	1.29	0.00	72.50
23.24	1.29	0.00	72.50
23.26	1.28	0.00	70.00
23.28	1.28	0.00	70.00
23.30	1.29	0.00	72.50
23.32	1.29	0.00	72.50
23.34	1.29	0.00	72.50
23.36	1.28	0.00	70.00
23.38	1.29	0.00	72.50
23.40	1.29	0.00	72.50
23.42	1.29	0.00	72.50
23.44	1.29	0.00	72.50
23.46	1.29	0.00	72.50
23.48	1.28	0.00	70.00
23.50	1.28	0.00	70.00
23.52	1.28	0.00	70.00
23.54	1.28	0.00	70.00
23.56	1.28	0.00	70.00
23.58	1.28	0.00	70.00
23.60	1.28	0.00	70.00
23.62	1.28	0.00	70.00
23.64	1.28	0.00	70.00
23.66	1.28	0.00	70.00
23.68	1.28	0.00	70.00
23.70	1.28	0.00	70.00
23.72	1.28	0.00	70.00
23.74	1.28	0.00	70.00
23.76	1.28	0.00	70.00
23.78	1.28	0.00	70.00
23.80	1.28	0.00	70.00
23.82	1.28	0.00	70.00
23.84	1.28	0.00	70.00
23.86	1.28	0.00	70.00
23.88	1.28	0.00	70.00
23.90	1.28	0.00	70.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E181

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
23.92	1.28	0.00	70.00
23.94	1.29	0.00	72.50
23.96	1.29	0.00	72.50
23.98	1.28	0.00	70.00
24.00	1.28	0.00	70.00
24.02	1.29	0.00	72.50
24.04	1.29	0.00	72.50
24.06	1.28	0.00	70.00
24.08	1.28	0.00	70.00
24.10	1.28	0.00	70.00
24.12	1.28	0.00	70.00
24.14	1.28	0.00	70.00
24.16	1.28	0.00	70.00
24.18	1.28	0.00	70.00
24.20	1.29	0.00	72.50
24.22	1.29	0.00	72.50
24.24	1.28	0.00	70.00
24.26	1.29	0.00	72.50
24.28	1.29	0.00	72.50
24.30	1.29	0.00	72.50
24.32	1.29	0.00	72.50
24.34	1.29	0.00	72.50
24.36	1.29	0.00	72.50
24.38	1.29	0.00	72.50
24.40	1.29	0.00	72.50
24.42	1.29	0.00	72.50
24.44	1.29	0.00	72.50
24.46	1.29	0.00	72.50
24.48	1.29	0.00	72.50
24.50	1.29	0.00	72.50
24.52	1.28	0.00	70.00
24.54	1.28	0.00	70.00
24.56	1.28	0.00	70.00
24.58	1.28	0.00	70.00
24.60	1.28	0.00	70.00
24.62	1.29	0.00	72.50
24.64	1.29	0.00	72.50
24.66	1.28	0.00	70.00
24.68	1.28	0.00	70.00
24.70	1.29	0.00	72.50
24.72	1.29	0.00	72.50
24.74	1.29	0.00	72.50
24.76	1.29	0.00	72.50
24.78	1.29	0.00	72.50
24.80	1.29	0.00	72.50
24.82	1.30	0.00	75.00
24.84	1.29	0.00	72.50
24.86	1.29	0.00	72.50
24.88	1.29	0.00	72.50
24.90	1.29	0.00	72.50
24.92	1.29	0.00	72.50
24.94	1.29	0.00	72.50

Altran Report
96227-MR-01 Rev. 3
Att/Appx. E Sh E182

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.96	1.29	0.00	72.50
24.98	1.29	0.00	72.50
25.00	1.29	0.00	72.50
25.02	1.29	0.00	72.50
25.04	1.30	0.00	75.00
25.06	1.29	0.00	72.50
25.08	1.29	0.00	72.50
25.10	1.29	0.00	72.50
25.12	1.28	0.00	70.00
25.14	1.28	0.00	70.00
25.16	1.28	0.00	70.00
25.18	1.28	0.00	70.00
25.20	1.28	0.00	70.00
25.22	1.28	0.00	70.00
25.24	1.28	0.00	70.00
25.26	1.28	0.00	70.00
25.28	1.28	0.00	70.00
25.30	1.28	0.00	70.00
25.32	1.28	0.00	70.00
25.34	1.28	0.00	70.00
25.36	1.28	0.00	70.00
25.38	1.29	0.00	72.50
25.40	1.29	0.00	72.50
25.42	1.30	0.00	75.00
25.44	1.30	0.00	75.00
25.46	1.30	0.00	75.00
25.48	1.30	0.00	75.00
25.50	1.30	0.00	75.00
25.52	1.30	0.00	75.00
25.54	1.30	0.00	75.00
25.56	1.30	0.00	75.00
25.58	1.30	0.00	75.00
25.60	1.31	0.00	77.50
25.62	1.30	0.00	75.00
25.64	1.30	0.00	75.00
25.66	1.30	0.00	75.00
25.68	1.30	0.00	75.00
25.70	1.29	0.00	72.50
25.72	1.30	0.00	75.00
25.74	1.29	0.00	72.50
25.76	1.29	0.00	72.50
25.78	1.29	0.00	72.50
25.80	1.29	0.00	72.50
25.82	1.29	0.00	72.50
25.84	1.30	0.00	75.00
25.86	1.30	0.00	75.00
25.88	1.30	0.00	75.00
25.90	1.30	0.00	75.00
25.92	1.30	0.00	75.00
25.94	1.30	0.00	75.00
25.96	1.30	0.00	75.00
25.98	1.29	0.00	72.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E183

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
26.00	1.29	0.00	72.50
26.02	1.29	0.00	72.50
26.04	1.29	0.00	72.50
26.06	1.29	0.00	72.50
26.08	1.29	0.00	72.50
26.10	1.29	0.00	72.50
26.12	1.29	0.00	72.50
26.14	1.29	0.00	72.50
26.16	1.29	0.00	72.50
26.18	1.29	0.00	72.50
26.20	1.30	0.00	75.00
26.22	1.30	0.00	75.00
26.24	1.30	0.00	75.00
26.26	1.29	0.00	72.50
26.28	1.29	0.00	72.50
26.30	1.30	0.00	75.00
26.32	1.30	0.00	75.00
26.34	1.30	0.00	75.00
26.36	1.29	0.00	72.50
26.38	1.29	0.00	72.50
26.40	1.30	0.00	75.00
26.42	1.30	0.00	75.00
26.44	1.30	0.00	75.00
26.46	1.30	0.00	75.00
26.48	1.30	0.00	75.00
26.50	1.30	0.00	75.00
26.52	1.30	0.00	75.00
26.54	1.30	0.00	75.00
26.56	1.30	0.00	75.00
26.58	1.31	0.00	77.50
26.60	1.31	0.00	77.50
26.62	1.31	0.00	77.50
26.64	1.31	0.00	77.50
26.66	1.31	0.00	77.50
26.68	1.31	0.00	77.50
26.70	1.31	0.00	77.50
26.72	1.31	0.00	77.50
26.74	1.31	0.00	77.50
26.76	1.31	0.00	77.50
26.78	1.30	0.00	75.00
26.80	1.30	0.00	75.00
26.82	1.31	0.00	77.50
26.84	1.31	0.00	77.50
26.86	1.31	0.00	77.50
26.88	1.30	0.00	75.00
26.90	1.30	0.00	75.00
26.92	1.30	0.00	75.00
26.94	1.30	0.00	75.00
26.96	1.30	0.00	75.00
26.98	1.30	0.00	75.00
27.00	1.30	0.00	75.00
27.02	1.30	0.00	75.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E184

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.04	1.30	0.00	75.00
27.06	1.30	0.00	75.00
27.08	1.30	0.00	75.00
27.10	1.30	0.00	75.00
27.12	1.30	0.00	75.00
27.14	1.31	0.00	77.50
27.16	1.31	0.00	77.50
27.18	1.31	0.00	77.50
27.20	1.31	0.00	77.50
27.22	1.31	0.00	77.50
27.24	1.32	0.00	80.00
27.26	1.32	0.00	80.00
27.28	1.31	0.00	77.50
27.30	1.31	0.00	77.50
27.32	1.31	0.00	77.50
27.34	1.31	0.00	77.50
27.36	1.31	0.00	77.50
27.38	1.31	0.00	77.50
27.40	1.31	0.00	77.50
27.42	1.31	0.00	77.50
27.44	1.31	0.00	77.50
27.46	1.31	0.00	77.50
27.48	1.31	0.00	77.50
27.50	1.31	0.00	77.50
27.52	1.31	0.00	77.50
27.54	1.30	0.00	75.00
27.56	1.30	0.00	75.00
27.58	1.30	0.00	75.00
27.60	1.30	0.00	75.00
27.62	1.30	0.00	75.00
27.64	1.30	0.00	75.00
27.66	1.30	0.00	75.00
27.68	1.30	0.00	75.00
27.70	1.30	0.00	75.00
27.72	1.30	0.00	75.00
27.74	1.29	0.00	72.50
27.76	1.29	0.00	72.50
27.78	1.29	0.00	72.50
27.80	1.29	0.00	72.50
27.82	1.29	0.00	72.50
27.84	1.29	0.00	72.50
27.86	1.29	0.00	72.50
27.88	1.29	0.00	72.50
27.90	1.30	0.00	75.00
27.92	1.30	0.00	75.00
27.94	1.30	0.00	75.00
27.96	1.30	0.00	75.00
27.98	1.29	0.00	72.50
28.00	1.30	0.00	75.00
28.02	1.30	0.00	75.00
28.04	1.29	0.00	72.50
28.06	1.30	0.00	75.00

Altran Report
962271-TR-01 Rev. 3
Att/Appx. E Sh E185

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
28.08	1.30	0.00	75.00
28.10	1.30	0.00	75.00
28.12	1.30	0.00	75.00
28.14	1.30	0.00	75.00
28.16	1.30	0.00	75.00
28.18	1.29	0.00	72.50
28.20	1.29	0.00	72.50
28.22	1.29	0.00	72.50
28.24	1.29	0.00	72.50
28.26	1.30	0.00	75.00
28.28	1.30	0.00	75.00
28.30	1.30	0.00	75.00
28.32	1.30	0.00	75.00
28.34	1.30	0.00	75.00
28.36	1.30	0.00	75.00
28.38	1.30	0.00	75.00
28.40	1.30	0.00	75.00
28.42	1.30	0.00	75.00
28.44	1.30	0.00	75.00
28.46	1.30	0.00	75.00
28.48	1.31	0.00	77.50
28.50	1.31	0.00	77.50
28.52	1.31	0.00	77.50
28.54	1.31	0.00	77.50
28.56	1.30	0.00	75.00
28.58	1.30	0.00	75.00
28.60	1.30	0.00	75.00
28.62	1.30	0.00	75.00
28.64	1.30	0.00	75.00
28.66	1.30	0.00	75.00
28.68	1.30	0.00	75.00
28.70	1.30	0.00	75.00
28.72	1.30	0.00	75.00
28.74	1.30	0.00	75.00
28.76	1.29	0.00	72.50
28.78	1.29	0.00	72.50
28.80	1.29	0.00	72.50
28.82	1.29	0.00	72.50
28.84	1.29	0.00	72.50
28.86	1.29	0.00	72.50
28.88	1.29	0.00	72.50
28.90	1.29	0.00	72.50
28.92	1.30	0.00	75.00
28.94	1.30	0.00	75.00
28.96	1.29	0.00	72.50
28.98	1.29	0.00	72.50
29.00	1.28	0.00	70.00
29.02	1.28	0.00	70.00
29.04	1.28	0.00	70.00
29.06	1.28	0.00	70.00
29.08	1.29	0.00	72.50
29.10	1.29	0.00	72.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E186

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.12	1.29	0.00	72.50
29.14	1.29	0.00	72.50
29.16	1.28	0.00	70.00
29.18	1.29	0.00	72.50
29.20	1.28	0.00	70.00
29.22	1.28	0.00	70.00
29.24	1.29	0.00	72.50
29.26	1.29	0.00	72.50
29.28	1.29	0.00	72.50
29.30	1.29	0.00	72.50
29.32	1.29	0.00	72.50
29.34	1.29	0.00	72.50
29.36	1.30	0.00	75.00
29.38	1.30	0.00	75.00
29.40	1.30	0.00	75.00
29.42	1.30	0.00	75.00
29.44	1.30	0.00	75.00
29.46	1.30	0.00	75.00
29.48	1.30	0.00	75.00
29.50	1.30	0.00	75.00
29.52	1.30	0.00	75.00
29.54	1.30	0.00	75.00
29.56	1.31	0.00	77.50
29.58	1.30	0.00	75.00
29.60	1.30	0.00	75.00
29.62	1.30	0.00	75.00
29.64	1.30	0.00	75.00
29.66	1.30	0.00	75.00
29.68	1.30	0.00	75.00
29.70	1.30	0.00	75.00
29.72	1.31	0.00	77.50
29.74	1.31	0.00	77.50
29.76	1.31	0.00	77.50
29.78	1.31	0.00	77.50
29.80	1.31	0.00	77.50
29.82	1.31	0.00	77.50
29.84	1.31	0.00	77.50
29.86	1.31	0.00	77.50
29.88	1.31	0.00	77.50
29.90	1.31	0.00	77.50
29.92	1.31	0.00	77.50
29.94	1.30	0.00	75.00
29.96	1.31	0.00	77.50
29.98	1.31	0.00	77.50
30.00	1.31	0.00	77.50

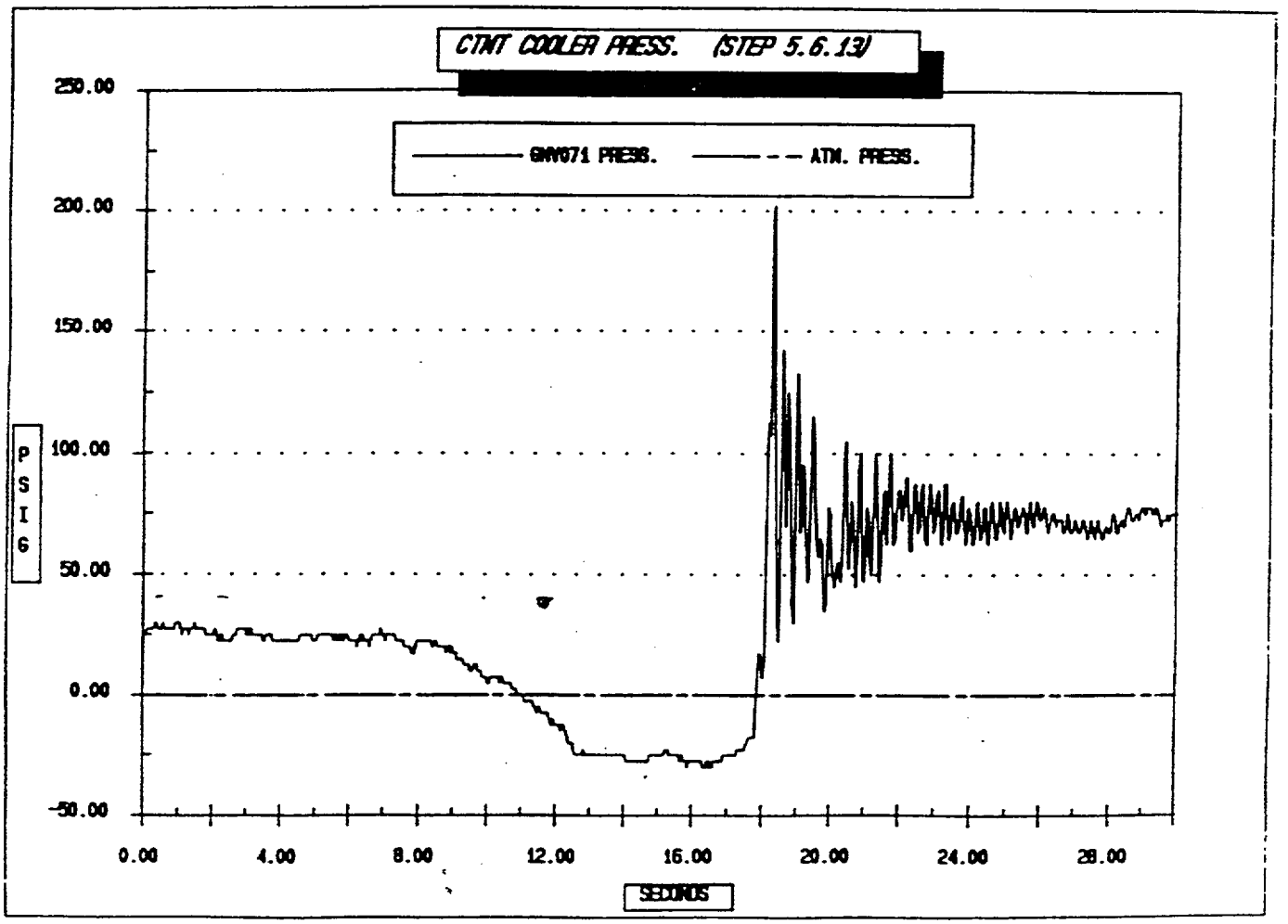
Altran Report
96227-TR.01 Rev. 3
Att./Appx. E Sh E187

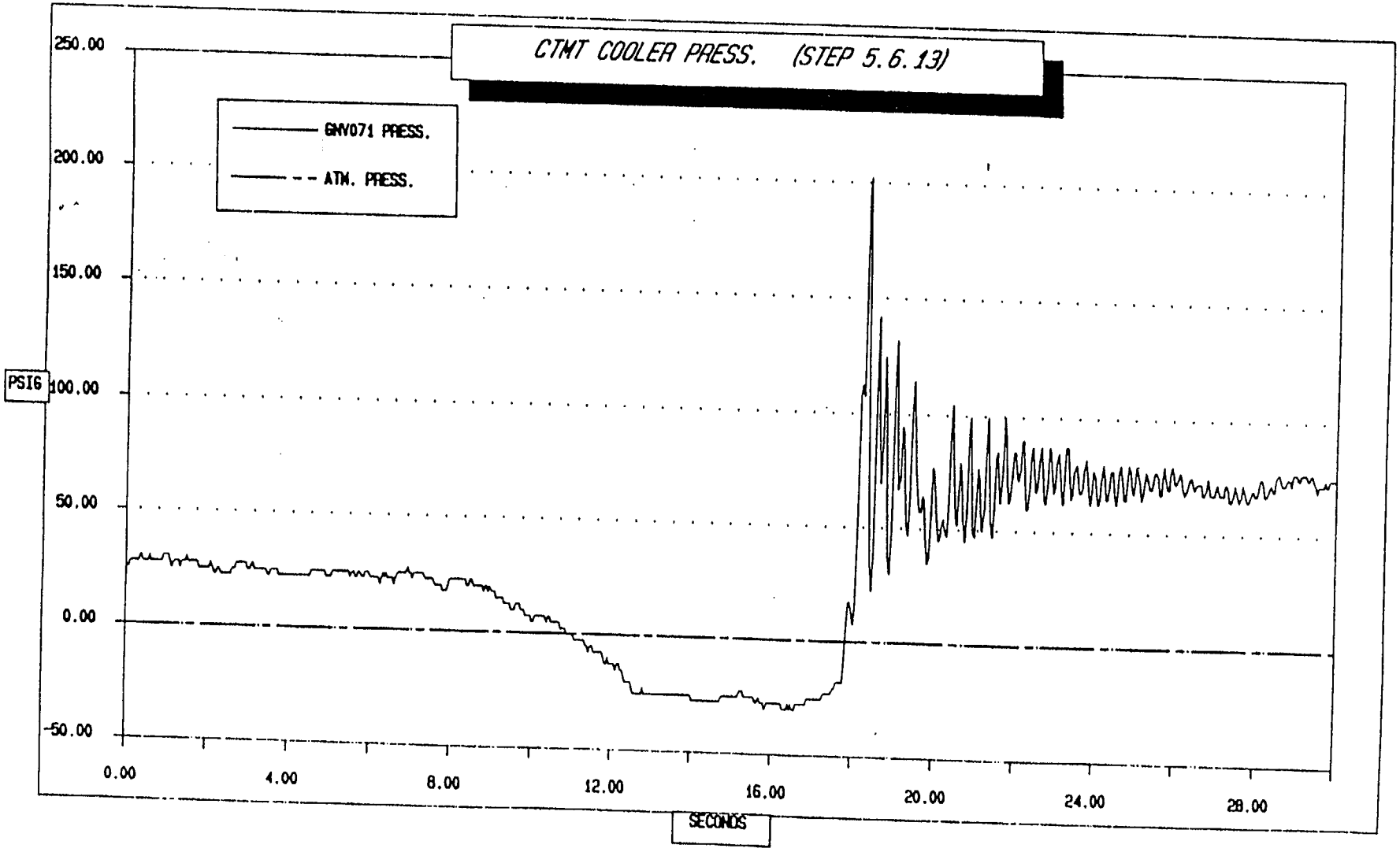
Data collected during step 5.6.13, SI without loss of offsite power. Data shows service water shutdown during load shed and ESW pump started by the LOCA Sequencer. Service water was in service prior to SI signal.

Test: STS KJ-0018, STEP 5.6.13	
Run:	2.00
Device:	MB16
Channel:	1
Event:	1
First Sample:	980.00
Last Sample:	1730.00
Trigger Date:	11-12-1991
Trigger Time:	18:42:58.03
X-Axis Units at First Sample:	39.16
Sample Separation:	0.04
X-Axis Units:	SECONDS
Y-Axis Upper Limit:	5.00
Y-Axis Lower Limit:	-5.00
Y-Axis Max Value:	1.81
Y-Axis Min Value:	0.88
Y-Axis Units:	VOLTS

Altran Report
96227-MR-01 Rev. 3
Att/Appx. E Sh E188

Attachment 6 to Calculation No. EF-S-010
Calculation Revision No. 00
Originator: [illegible] Date: [illegible]
Verified By: [illegible] Date: 5/7/92
Sheet 1 of 17





Altran Report
96227-CR-01 Rev. 3
Att/Appx. E Sh. E189

Attachment 6 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 2 of 17

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
0.00	1.10	0.00	25.00
0.04	1.10	0.00	25.00
0.08	1.11	0.00	27.50
0.12	1.11	0.00	27.50
0.16	1.11	0.00	27.50
0.20	1.11	0.00	27.50
0.24	1.11	0.00	27.50
0.28	1.11	0.00	27.50
0.32	1.12	0.00	30.00
0.36	1.12	0.00	30.00
0.40	1.11	0.00	27.50
0.44	1.11	0.00	27.50
0.48	1.11	0.00	27.50
0.52	1.11	0.00	27.50
0.56	1.12	0.00	30.00
0.60	1.11	0.00	27.50
0.64	1.11	0.00	27.50
0.68	1.11	0.00	27.50
0.72	1.11	0.00	27.50
0.76	1.11	0.00	27.50
0.80	1.11	0.00	27.50
0.84	1.11	0.00	27.50
0.88	1.11	0.00	27.50
0.92	1.12	0.00	30.00
0.96	1.12	0.00	30.00
1.00	1.12	0.00	30.00
1.04	1.12	0.00	30.00
1.08	1.11	0.00	27.50
1.12	1.10	0.00	25.00
1.16	1.11	0.00	27.50
1.20	1.11	0.00	27.50
1.24	1.11	0.00	27.50
1.28	1.11	0.00	27.50
1.32	1.10	0.00	25.00
1.36	1.11	0.00	27.50
1.40	1.11	0.00	27.50
1.44	1.11	0.00	27.50
1.48	1.12	0.00	30.00
1.52	1.11	0.00	27.50
1.56	1.11	0.00	27.50
1.60	1.11	0.00	27.50
1.64	1.11	0.00	27.50
1.68	1.11	0.00	27.50
1.72	1.11	0.00	27.50
1.76	1.11	0.00	27.50
1.80	1.10	0.00	25.00
1.84	1.10	0.00	25.00
1.88	1.10	0.00	25.00
1.92	1.10	0.00	25.00
1.96	1.10	0.00	25.00
2.00	1.10	0.00	25.00
2.04	1.10	0.00	25.00

Altran Report
962271-SR-01 Rev. 3
Att/Appx. E Sh E190

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
2.08	1.11	0.00	27.50
2.12	1.10	0.00	25.00
2.16	1.09	0.00	22.50
2.20	1.09	0.00	22.50
2.24	1.10	0.00	25.00
2.28	1.10	0.00	25.00
2.32	1.09	0.00	22.50
2.36	1.09	0.00	22.50
2.40	1.09	0.00	22.50
2.44	1.09	0.00	22.50
2.48	1.09	0.00	22.50
2.52	1.09	0.00	22.50
2.56	1.09	0.00	22.50
2.60	1.10	0.00	25.00
2.64	1.10	0.00	25.00
2.68	1.10	0.00	25.00
2.72	1.11	0.00	27.50
2.76	1.11	0.00	27.50
2.80	1.11	0.00	27.50
2.84	1.11	0.00	27.50
2.88	1.11	0.00	27.50
2.92	1.11	0.00	27.50
2.96	1.11	0.00	27.50
3.00	1.10	0.00	25.00
3.04	1.10	0.00	25.00
3.08	1.11	0.00	27.50
3.12	1.11	0.00	27.50
3.16	1.10	0.00	25.00
3.20	1.10	0.00	25.00
3.24	1.10	0.00	25.00
3.28	1.10	0.00	25.00
3.32	1.10	0.00	25.00
3.36	1.10	0.00	25.00
3.40	1.10	0.00	25.00
3.44	1.10	0.00	25.00
3.48	1.09	0.00	22.50
3.52	1.09	0.00	22.50
3.56	1.10	0.00	25.00
3.60	1.10	0.00	25.00
3.64	1.10	0.00	25.00
3.68	1.10	0.00	25.00
3.72	1.10	0.00	25.00
3.76	1.09	0.00	22.50
3.80	1.09	0.00	22.50
3.84	1.09	0.00	22.50
3.88	1.09	0.00	22.50
3.92	1.09	0.00	22.50
3.96	1.09	0.00	22.50
4.00	1.09	0.00	22.50
4.04	1.09	0.00	22.50
4.08	1.09	0.00	22.50
4.12	1.09	0.00	22.50

Altran Report
96227-NR-01 Rev. 3
Att/Appx. E Sh E191

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
4.16	1.09	0.00	22.50
4.20	1.09	0.00	22.50
4.24	1.09	0.00	22.50
4.28	1.09	0.00	22.50
4.32	1.09	0.00	22.50
4.36	1.09	0.00	22.50
4.40	1.09	0.00	22.50
4.44	1.09	0.00	22.50
4.48	1.09	0.00	22.50
4.52	1.09	0.00	22.50
4.56	1.10	0.00	25.00
4.60	1.10	0.00	25.00
4.64	1.10	0.00	25.00
4.68	1.10	0.00	25.00
4.72	1.10	0.00	25.00
4.76	1.10	0.00	25.00
4.80	1.10	0.00	25.00
4.84	1.10	0.00	25.00
4.88	1.10	0.00	25.00
4.92	1.09	0.00	22.50
4.96	1.09	0.00	22.50
5.00	1.09	0.00	22.50
5.04	1.09	0.00	22.50
5.08	1.10	0.00	25.00
5.12	1.10	0.00	25.00
5.16	1.10	0.00	25.00
5.20	1.10	0.00	25.00
5.24	1.10	0.00	25.00
5.28	1.10	0.00	25.00
5.32	1.10	0.00	25.00
5.36	1.10	0.00	25.00
5.40	1.10	0.00	25.00
5.44	1.10	0.00	25.00
5.48	1.10	0.00	25.00
5.52	1.09	0.00	22.50
5.56	1.10	0.00	25.00
5.60	1.10	0.00	25.00
5.64	1.09	0.00	22.50
5.68	1.09	0.00	22.50
5.72	1.10	0.00	25.00
5.76	1.10	0.00	25.00
5.80	1.09	0.00	22.50
5.84	1.09	0.00	22.50
5.88	1.10	0.00	25.00
5.92	1.10	0.00	25.00
5.96	1.10	0.00	25.00
6.00	1.09	0.00	22.50
6.04	1.09	0.00	22.50
6.08	1.09	0.00	22.50
6.12	1.09	0.00	22.50
6.16	1.09	0.00	22.50
6.20	1.09	0.00	22.50

Altran Report
96287-TR-01 Rev. 3
Att/Appx. E Sh E192

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
6.24	1.08	0.00	20.00
6.28	1.09	0.00	22.50
6.32	1.10	0.00	25.00
6.36	1.09	0.00	22.50
6.40	1.10	0.00	25.00
6.44	1.09	0.00	22.50
6.48	1.09	0.00	22.50
6.52	1.09	0.00	22.50
6.56	1.09	0.00	22.50
6.60	1.08	0.00	20.00
6.64	1.09	0.00	22.50
6.68	1.10	0.00	25.00
6.72	1.10	0.00	25.00
6.76	1.10	0.00	25.00
6.80	1.10	0.00	25.00
6.84	1.10	0.00	25.00
6.88	1.10	0.00	25.00
6.92	1.11	0.00	27.50
6.96	1.10	0.00	25.00
7.00	1.10	0.00	25.00
7.04	1.09	0.00	22.50
7.08	1.10	0.00	25.00
7.12	1.10	0.00	25.00
7.16	1.10	0.00	25.00
7.20	1.10	0.00	25.00
7.24	1.10	0.00	25.00
7.28	1.10	0.00	25.00
7.32	1.10	0.00	25.00
7.36	1.09	0.00	22.50
7.40	1.09	0.00	22.50
7.44	1.09	0.00	22.50
7.48	1.09	0.00	22.50
7.52	1.09	0.00	22.50
7.56	1.09	0.00	22.50
7.60	1.08	0.00	20.00
7.64	1.08	0.00	20.00
7.68	1.08	0.00	20.00
7.72	1.08	0.00	20.00
7.76	1.08	0.00	20.00
7.80	1.07	0.00	17.50
7.84	1.07	0.00	17.50
7.88	1.07	0.00	17.50
7.92	1.08	0.00	20.00
7.96	1.09	0.00	22.50
8.00	1.09	0.00	22.50
8.04	1.09	0.00	22.50
8.08	1.09	0.00	22.50
8.12	1.09	0.00	22.50
8.16	1.09	0.00	22.50
8.20	1.09	0.00	22.50
8.24	1.09	0.00	22.50
8.28	1.09	0.00	22.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E193

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
8.32	1.09	0.00	22.50
8.36	1.09	0.00	22.50
8.40	1.08	0.00	20.00
8.44	1.08	0.00	20.00
8.48	1.09	0.00	22.50
8.52	1.09	0.00	22.50
8.56	1.08	0.00	20.00
8.60	1.08	0.00	20.00
8.64	1.08	0.00	20.00
8.68	1.08	0.00	20.00
8.72	1.08	0.00	20.00
8.76	1.08	0.00	20.00
8.80	1.07	0.00	17.50
8.84	1.08	0.00	20.00
8.88	1.08	0.00	20.00
8.92	1.07	0.00	17.50
8.96	1.08	0.00	20.00
9.00	1.07	0.00	17.50
9.04	1.07	0.00	17.50
9.08	1.07	0.00	17.50
9.12	1.06	0.00	15.00
9.16	1.06	0.00	15.00
9.20	1.06	0.00	15.00
9.24	1.06	0.00	15.00
9.28	1.06	0.00	15.00
9.32	1.05	0.00	12.50
9.36	1.05	0.00	12.50
9.40	1.05	0.00	12.50
9.44	1.05	0.00	12.50
9.48	1.04	0.00	10.00
9.52	1.04	0.00	10.00
9.56	1.04	0.00	10.00
9.60	1.05	0.00	12.50
9.64	1.05	0.00	12.50
9.68	1.05	0.00	12.50
9.72	1.04	0.00	10.00
9.76	1.04	0.00	10.00
9.80	1.04	0.00	10.00
9.84	1.03	0.00	7.50
9.88	1.03	0.00	7.50
9.92	1.03	0.00	7.50
9.96	1.03	0.00	7.50
10.00	1.02	0.00	5.00
10.04	1.02	0.00	5.00
10.08	1.03	0.00	7.50
10.12	1.03	0.00	7.50
10.16	1.03	0.00	7.50
10.20	1.03	0.00	7.50
10.24	1.03	0.00	7.50
10.28	1.03	0.00	7.50
10.32	1.03	0.00	7.50
10.36	1.02	0.00	5.00

Altran Report
9622-7-TR-01 Rev. 3
Att./Appx. E Sh E194

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
10.40	1.03	0.00	7.50
10.44	1.03	0.00	7.50
10.48	1.02	0.00	5.00
10.52	1.02	0.00	5.00
10.56	1.02	0.00	5.00
10.60	1.02	0.00	5.00
10.64	1.02	0.00	5.00
10.68	1.02	0.00	5.00
10.72	1.01	0.00	2.50
10.76	1.01	0.00	2.50
10.80	1.01	0.00	2.50
10.84	1.01	0.00	2.50
10.88	1.00	0.00	0.00
10.92	1.00	0.00	0.00
10.96	1.00	0.00	0.00
11.00	1.00	0.00	0.00
11.04	1.00	0.00	0.00
11.08	0.99	0.00	-2.50
11.12	0.99	0.00	-2.50
11.16	0.99	0.00	-2.50
11.20	0.99	0.00	-2.50
11.24	0.99	0.00	-2.50
11.28	0.99	0.00	-2.50
11.32	0.99	0.00	-2.50
11.36	0.98	0.00	-5.00
11.40	0.98	0.00	-5.00
11.44	0.97	0.00	-7.50
11.48	0.98	0.00	-5.00
11.52	0.98	0.00	-5.00
11.56	0.97	0.00	-7.50
11.60	0.97	0.00	-7.50
11.64	0.97	0.00	-7.50
11.68	0.97	0.00	-7.50
11.72	0.97	0.00	-7.50
11.76	0.97	0.00	-7.50
11.80	0.96	0.00	-10.00
11.84	0.95	0.00	-12.50
11.88	0.95	0.00	-12.50
11.92	0.96	0.00	-10.00
11.96	0.95	0.00	-12.50
12.00	0.95	0.00	-12.50
12.04	0.95	0.00	-12.50
12.08	0.95	0.00	-12.50
12.12	0.94	0.00	-15.00
12.16	0.95	0.00	-12.50
12.20	0.95	0.00	-12.50
12.24	0.94	0.00	-15.00
12.28	0.94	0.00	-15.00
12.32	0.93	0.00	-17.50
12.36	0.92	0.00	-20.00
12.40	0.92	0.00	-20.00
12.44	0.92	0.00	-20.00

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E195

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
12.48	0.92	0.00	-20.00
12.52	0.91	0.00	-22.50
12.56	0.90	0.00	-25.00
12.60	0.90	0.00	-25.00
12.64	0.90	0.00	-25.00
12.68	0.90	0.00	-25.00
12.72	0.90	0.00	-25.00
12.76	0.90	0.00	-25.00
12.80	0.91	0.00	-22.50
12.84	0.90	0.00	-25.00
12.88	0.90	0.00	-25.00
12.92	0.90	0.00	-25.00
12.96	0.90	0.00	-25.00
13.00	0.90	0.00	-25.00
13.04	0.90	0.00	-25.00
13.08	0.90	0.00	-25.00
13.12	0.90	0.00	-25.00
13.16	0.90	0.00	-25.00
13.20	0.90	0.00	-25.00
13.24	0.90	0.00	-25.00
13.28	0.90	0.00	-25.00
13.32	0.90	0.00	-25.00
13.36	0.90	0.00	-25.00
13.40	0.90	0.00	-25.00
13.44	0.90	0.00	-25.00
13.48	0.90	0.00	-25.00
13.52	0.90	0.00	-25.00
13.56	0.90	0.00	-25.00
13.60	0.90	0.00	-25.00
13.64	0.90	0.00	-25.00
13.68	0.90	0.00	-25.00
13.72	0.90	0.00	-25.00
13.76	0.90	0.00	-25.00
13.80	0.90	0.00	-25.00
13.84	0.90	0.00	-25.00
13.88	0.90	0.00	-25.00
13.92	0.90	0.00	-25.00
13.96	0.90	0.00	-25.00
14.00	0.90	0.00	-25.00
14.04	0.89	0.00	-27.50
14.08	0.89	0.00	-27.50
14.12	0.89	0.00	-27.50
14.16	0.89	0.00	-27.50
14.20	0.89	0.00	-27.50
14.24	0.89	0.00	-27.50
14.28	0.89	0.00	-27.50
14.32	0.89	0.00	-27.50
14.36	0.89	0.00	-27.50
14.40	0.89	0.00	-27.50
14.44	0.89	0.00	-27.50
14.48	0.89	0.00	-27.50
14.52	0.89	0.00	-27.50

Altran Report
96237-TR-01 Rev. 3
Att./Appx. E Sh E196

Altran Report
9627-AVR-01 Rev. 3
Att./Appx. E Sh. E197

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
14.56	0.89	0.00	-27.50
14.60	0.89	0.00	-27.50
14.64	0.89	0.00	-27.50
14.68	0.89	0.00	-27.50
14.72	0.89	0.00	-27.50
14.76	0.90	0.00	-25.00
14.80	0.90	0.00	-25.00
14.84	0.90	0.00	-25.00
14.88	0.90	0.00	-25.00
14.92	0.90	0.00	-25.00
14.96	0.90	0.00	-25.00
15.00	0.90	0.00	-25.00
15.04	0.90	0.00	-25.00
15.08	0.90	0.00	-25.00
15.12	0.90	0.00	-25.00
15.16	0.90	0.00	-25.00
15.20	0.91	0.00	-22.50
15.24	0.91	0.00	-22.50
15.28	0.91	0.00	-22.50
15.32	0.90	0.00	-25.00
15.36	0.90	0.00	-25.00
15.40	0.90	0.00	-25.00
15.44	0.90	0.00	-25.00
15.48	0.90	0.00	-25.00
15.52	0.90	0.00	-25.00
15.56	0.90	0.00	-25.00
15.60	0.89	0.00	-27.50
15.64	0.89	0.00	-27.50
15.68	0.90	0.00	-25.00
15.72	0.89	0.00	-27.50
15.76	0.89	0.00	-27.50
15.80	0.89	0.00	-27.50
15.84	0.88	0.00	-30.00
15.88	0.89	0.00	-27.50
15.92	0.89	0.00	-27.50
15.96	0.89	0.00	-27.50
16.00	0.89	0.00	-27.50
16.04	0.89	0.00	-27.50
16.08	0.89	0.00	-27.50
16.12	0.89	0.00	-27.50
16.16	0.89	0.00	-27.50
16.20	0.89	0.00	-27.50
16.24	0.89	0.00	-27.50
16.28	0.88	0.00	-30.00
16.32	0.88	0.00	-30.00
16.36	0.88	0.00	-30.00
16.40	0.89	0.00	-27.50
16.44	0.88	0.00	-30.00
16.48	0.89	0.00	-27.50
16.52	0.88	0.00	-30.00
16.56	0.88	0.00	-30.00
16.60	0.89	0.00	-27.50

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh E198

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
16.64	0.89	0.00	-27.50
16.68	0.89	0.00	-27.50
16.72	0.89	0.00	-27.50
16.76	0.89	0.00	-27.50
16.80	0.89	0.00	-27.50
16.84	0.89	0.00	-27.50
16.88	0.90	0.00	-25.00
16.92	0.90	0.00	-25.00
16.96	0.90	0.00	-25.00
17.00	0.90	0.00	-25.00
17.04	0.90	0.00	-25.00
17.08	0.90	0.00	-25.00
17.12	0.90	0.00	-25.00
17.16	0.90	0.00	-25.00
17.20	0.90	0.00	-25.00
17.24	0.90	0.00	-25.00
17.28	0.91	0.00	-22.50
17.32	0.91	0.00	-22.50
17.36	0.91	0.00	-22.50
17.40	0.91	0.00	-22.50
17.44	0.91	0.00	-22.50
17.48	0.91	0.00	-22.50
17.52	0.92	0.00	-20.00
17.56	0.92	0.00	-20.00
17.60	0.93	0.00	-17.50
17.64	0.93	0.00	-17.50
17.68	0.93	0.00	-17.50
17.72	0.93	0.00	-17.50
17.76	0.93	0.00	-17.50
17.80	0.97	0.00	-7.50
17.84	1.02	0.00	5.00
17.88	1.07	0.00	17.50
17.92	1.07	0.00	17.50
17.96	1.05	0.00	12.50
18.00	1.03	0.00	7.50
18.04	1.06	0.00	15.00
18.08	1.21	0.00	52.50
18.12	1.43	0.00	107.50
18.16	1.45	0.00	112.50
18.20	1.43	0.00	107.50
18.24	1.78	0.00	195.00
18.28	1.81	0.00	202.50
18.32	1.50	0.00	125.00
18.36	1.26	0.00	65.00
18.40	1.14	0.00	35.00
18.44	1.09	0.00	22.50
18.48	1.15	0.00	37.50
18.52	1.44	0.00	110.00
18.56	1.57	0.00	142.50
18.60	1.40	0.00	100.00
18.64	1.28	0.00	70.00
18.68	1.35	0.00	87.50

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
18.72	1.50	0.00	125.00
18.76	1.42	0.00	105.00
18.80	1.26	0.00	65.00
18.84	1.15	0.00	37.50
18.88	1.12	0.00	30.00
18.92	1.22	0.00	55.00
18.96	1.47	0.00	117.50
19.00	1.53	0.00	132.50
19.04	1.38	0.00	95.00
19.08	1.27	0.00	67.50
19.12	1.29	0.00	72.50
19.16	1.38	0.00	95.00
19.20	1.37	0.00	92.50
19.24	1.28	0.00	70.00
19.28	1.21	0.00	52.50
19.32	1.19	0.00	47.50
19.36	1.26	0.00	65.00
19.40	1.41	0.00	102.50
19.44	1.46	0.00	115.00
19.48	1.39	0.00	97.50
19.52	1.31	0.00	77.50
19.56	1.25	0.00	62.50
19.60	1.23	0.00	57.50
19.64	1.23	0.00	57.50
19.68	1.26	0.00	65.00
19.72	1.25	0.00	62.50
19.76	1.19	0.00	47.50
19.80	1.14	0.00	35.00
19.84	1.15	0.00	37.50
19.88	1.22	0.00	55.00
19.92	1.31	0.00	77.50
19.96	1.30	0.00	75.00
20.00	1.24	0.00	60.00
20.04	1.20	0.00	50.00
20.08	1.18	0.00	45.00
20.12	1.19	0.00	47.50
20.16	1.21	0.00	52.50
20.20	1.22	0.00	55.00
20.24	1.20	0.00	50.00
20.28	1.19	0.00	47.50
20.32	1.24	0.00	60.00
20.36	1.37	0.00	92.50
20.40	1.42	0.00	105.00
20.44	1.33	0.00	82.50
20.48	1.23	0.00	57.50
20.52	1.21	0.00	52.50
20.56	1.26	0.00	65.00
20.60	1.32	0.00	80.00
20.64	1.29	0.00	72.50
20.68	1.22	0.00	55.00
20.72	1.18	0.00	45.00
20.76	1.23	0.00	57.50

Altran Report
962271-MR-01 Rev. 3
Alt/Appx. E Sh E199

Altran Report
962270TR-01 Rev. 3
Att/Appx. E Sh E200

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
20.80	1.37	0.00	92.50
20.84	1.40	0.00	100.00
20.88	1.30	0.00	75.00
20.92	1.20	0.00	50.00
20.96	1.19	0.00	47.50
21.00	1.25	0.00	62.50
21.04	1.31	0.00	77.50
21.08	1.29	0.00	72.50
21.12	1.23	0.00	57.50
21.16	1.20	0.00	50.00
21.20	1.24	0.00	60.00
21.24	1.35	0.00	87.50
21.28	1.40	0.00	100.00
21.32	1.31	0.00	77.50
21.36	1.22	0.00	55.00
21.40	1.19	0.00	47.50
21.44	1.24	0.00	60.00
21.48	1.33	0.00	82.50
21.52	1.34	0.00	85.00
21.56	1.28	0.00	70.00
21.60	1.25	0.00	62.50
21.64	1.31	0.00	77.50
21.68	1.40	0.00	100.00
21.72	1.37	0.00	92.50
21.76	1.29	0.00	72.50
21.80	1.25	0.00	62.50
21.84	1.26	0.00	65.00
21.88	1.30	0.00	75.00
21.92	1.34	0.00	85.00
21.96	1.34	0.00	85.00
22.00	1.31	0.00	77.50
22.04	1.29	0.00	72.50
22.08	1.31	0.00	77.50
22.12	1.36	0.00	90.00
22.16	1.36	0.00	90.00
22.20	1.30	0.00	75.00
22.24	1.24	0.00	60.00
22.28	1.24	0.00	60.00
22.32	1.28	0.00	70.00
22.36	1.34	0.00	85.00
22.40	1.35	0.00	87.50
22.44	1.31	0.00	77.50
22.48	1.27	0.00	67.50
22.52	1.28	0.00	70.00
22.56	1.33	0.00	82.50
22.60	1.35	0.00	87.50
22.64	1.31	0.00	77.50
22.68	1.26	0.00	65.00
22.72	1.25	0.00	62.50
22.76	1.29	0.00	72.50
22.80	1.35	0.00	87.50
22.84	1.34	0.00	85.00

Altran Report
96237-MR-01 Rev. 3
Att./Appx. E Sh. E201

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
22.88	1.30	0.00	75.00
22.92	1.27	0.00	67.50
22.96	1.28	0.00	70.00
23.00	1.32	0.00	80.00
23.04	1.34	0.00	85.00
23.08	1.31	0.00	77.50
23.12	1.27	0.00	67.50
23.16	1.25	0.00	62.50
23.20	1.29	0.00	72.50
23.24	1.35	0.00	87.50
23.28	1.35	0.00	87.50
23.32	1.30	0.00	75.00
23.36	1.26	0.00	65.00
23.40	1.27	0.00	67.50
23.44	1.31	0.00	77.50
23.48	1.32	0.00	80.00
23.52	1.30	0.00	75.00
23.56	1.27	0.00	67.50
23.60	1.27	0.00	67.50
23.64	1.28	0.00	70.00
23.68	1.31	0.00	77.50
23.72	1.33	0.00	82.50
23.76	1.30	0.00	75.00
23.80	1.27	0.00	67.50
23.84	1.25	0.00	62.50
23.88	1.27	0.00	67.50
23.92	1.31	0.00	77.50
23.96	1.30	0.00	75.00
24.00	1.27	0.00	67.50
24.04	1.25	0.00	62.50
24.08	1.26	0.00	65.00
24.12	1.29	0.00	72.50
24.16	1.32	0.00	80.00
24.20	1.30	0.00	75.00
24.24	1.26	0.00	65.00
24.28	1.26	0.00	65.00
24.32	1.28	0.00	70.00
24.36	1.31	0.00	77.50
24.40	1.31	0.00	77.50
24.44	1.27	0.00	67.50
24.48	1.25	0.00	62.50
24.52	1.27	0.00	67.50
24.56	1.31	0.00	77.50
24.60	1.32	0.00	80.00
24.64	1.29	0.00	72.50
24.68	1.26	0.00	65.00
24.72	1.26	0.00	65.00
24.76	1.29	0.00	72.50
24.80	1.32	0.00	80.00
24.84	1.31	0.00	77.50
24.88	1.28	0.00	70.00
24.92	1.27	0.00	67.50

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
24.96	1.29	0.00	72.50
25.00	1.32	0.00	80.00
25.04	1.31	0.00	77.50
25.08	1.29	0.00	72.50
25.12	1.26	0.00	65.00
25.16	1.27	0.00	67.50
25.20	1.29	0.00	72.50
25.24	1.31	0.00	77.50
25.28	1.30	0.00	75.00
25.32	1.28	0.00	70.00
25.36	1.28	0.00	70.00
25.40	1.29	0.00	72.50
25.44	1.31	0.00	77.50
25.48	1.31	0.00	77.50
25.52	1.30	0.00	75.00
25.56	1.27	0.00	67.50
25.60	1.27	0.00	67.50
25.64	1.30	0.00	75.00
25.68	1.32	0.00	80.00
25.72	1.30	0.00	75.00
25.76	1.28	0.00	70.00
25.80	1.28	0.00	70.00
25.84	1.31	0.00	77.50
25.88	1.32	0.00	80.00
25.92	1.31	0.00	77.50
25.96	1.29	0.00	72.50
26.00	1.29	0.00	72.50
26.04	1.30	0.00	75.00
26.08	1.31	0.00	77.50
26.12	1.30	0.00	75.00
26.16	1.28	0.00	70.00
26.20	1.27	0.00	67.50
26.24	1.28	0.00	70.00
26.28	1.29	0.00	72.50
26.32	1.30	0.00	75.00
26.36	1.30	0.00	75.00
26.40	1.29	0.00	72.50
26.44	1.28	0.00	70.00
26.48	1.29	0.00	72.50
26.52	1.29	0.00	72.50
26.56	1.29	0.00	72.50
26.60	1.29	0.00	72.50
26.64	1.27	0.00	67.50
26.68	1.27	0.00	67.50
26.72	1.28	0.00	70.00
26.76	1.30	0.00	75.00
26.80	1.29	0.00	72.50
26.84	1.27	0.00	67.50
26.88	1.27	0.00	67.50
26.92	1.27	0.00	67.50
26.96	1.28	0.00	70.00
27.00	1.29	0.00	72.50

Altran Report
96227-TR-01 Rev. 3
Att/Appx. E Sh. E202

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
27.04	1.28	0.00	70.00
27.08	1.27	0.00	67.50
27.12	1.27	0.00	67.50
27.16	1.27	0.00	67.50
27.20	1.29	0.00	72.50
27.24	1.29	0.00	72.50
27.28	1.28	0.00	70.00
27.32	1.26	0.00	65.00
27.36	1.26	0.00	65.00
27.40	1.27	0.00	67.50
27.44	1.29	0.00	72.50
27.48	1.28	0.00	70.00
27.52	1.27	0.00	67.50
27.56	1.26	0.00	65.00
27.60	1.27	0.00	67.50
27.64	1.29	0.00	72.50
27.68	1.28	0.00	70.00
27.72	1.27	0.00	67.50
27.76	1.26	0.00	65.00
27.80	1.26	0.00	65.00
27.84	1.27	0.00	67.50
27.88	1.28	0.00	70.00
27.92	1.28	0.00	70.00
27.96	1.27	0.00	67.50
28.00	1.27	0.00	67.50
28.04	1.28	0.00	70.00
28.08	1.30	0.00	75.00
28.12	1.30	0.00	75.00
28.16	1.29	0.00	72.50
28.20	1.27	0.00	67.50
28.24	1.27	0.00	67.50
28.28	1.28	0.00	70.00
28.32	1.29	0.00	72.50
28.36	1.29	0.00	72.50
28.40	1.28	0.00	70.00
28.44	1.28	0.00	70.00
28.48	1.30	0.00	75.00
28.52	1.31	0.00	77.50
28.56	1.31	0.00	77.50
28.60	1.30	0.00	75.00
28.64	1.29	0.00	72.50
28.68	1.29	0.00	72.50
28.72	1.29	0.00	72.50
28.76	1.30	0.00	75.00
28.80	1.30	0.00	75.00
28.84	1.30	0.00	75.00
28.88	1.29	0.00	72.50
28.92	1.31	0.00	77.50
28.96	1.31	0.00	77.50
29.00	1.31	0.00	77.50
29.04	1.30	0.00	75.00
29.08	1.30	0.00	75.00

Altran Report
96227-NR-01 Rev. 3
Att./Appx. E Sh E-203

SECONDS	XMTR OUTPUT	ATM. PRESS.	CALC. PRESS. VALUES
29.12	1.[illegible]	0.00	77.50
29.16	1.[illegible]	0.00	77.50
29.20	1.[illegible]	0.00	77.50
29.24	1.[illegible]	0.00	77.50
29.28	1.30	0.00	75.00
29.32	1.30	0.00	75.00
29.36	1.31	0.00	77.50
29.40	1.31	0.00	77.50
29.44	1.30	0.00	75.00
29.48	1.29	0.00	72.50
29.52	1.28	0.00	70.00
29.56	1.29	0.00	72.50
29.60	1.29	0.00	72.50
29.64	1.29	0.00	72.50
29.68	1.29	0.00	72.50
29.72	1.30	0.00	75.00
29.76	1.29	0.00	72.50
29.80	1.29	0.00	72.50
29.84	1.30	0.00	75.00
29.88	1.30	0.00	75.00
29.92	1.30	0.00	75.00
29.96	1.30	0.00	75.00
30.00	1.30	0.00	75.00

Attachment 6 to Calculation No. EF-S-010
Calculation Revision No. 00
Sheet 17 of 17

Altran Report
96227-TR-01 Rev. 3
Att./Appx. E Sh. E204

Appendix F - Fluid Structure Interaction

Number of pages including this sheet = 8

Typical SW configuration:

$\rho_{steel} := 488 \cdot \frac{lb}{ft^3}$ density of steel from Mark's [2] *

* References are listed at the end of Appendix F.

$E_{steel} := 29 \cdot 10^6 \cdot \frac{lb}{in^2}$ modulus of elasticity for steel from Mark's [2]

$\nu_{steel} := 0.29$ poisson's ratio for steel from Mark's [2]

$a_{steel} := \sqrt{\frac{E_{steel} \cdot g}{\rho_{steel}}}$ speed of sound in steel from [1]

$a_{steel} = 1.659 \cdot 10^4 \cdot \frac{ft}{sec}$

$a_{wtr} := 2300 \cdot \frac{ft}{sec}$ sonic velocity used in waterhammer calculation

$\rho_{wtr} := 61 \cdot \frac{lb}{ft^3}$ typical water density

$i := 0 .. 4$ $n := 0 .. 3$

$OD_i :=$	$t_i :=$	$L_n :=$
4.5·in	0.237·in	5·ft
8.625·in	0.322·in	10·ft
10.75·in	0.365·in	30·ft
14·in	0.438·in	65·ft
24·in	0.688·in	

typical pipe outside diameters and wall thickness for SCH40 from reference [4] and typical pipe lengths.

$ID_i := OD_i - 2 \cdot t_i$ pipe ID

$K := 1.7 \cdot 10^5 \cdot \frac{lbf}{in}$

$A_{f_i} := \frac{(ID_i)^2 \cdot \pi}{4}$ flow area

$A_{m_i} := \frac{\pi}{4} \cdot \left[(OD_i)^2 - (ID_i)^2 \right]$ pipe metal area

$M_{0,i} := L_0 \cdot (A_{m_i} \cdot \rho_{steel})$ mass of pipe

$M_{1,i} := L_1 \cdot (A_{m_i} \cdot \rho_{steel})$

$M_{2,i} := L_2 \cdot (A_{m_i} \cdot \rho_{steel})$

$M_{3,i} := L_3 \cdot (A_{m_i} \cdot \rho_{steel})$

$$M = \begin{bmatrix} 53.782 & 142.321 & 201.779 & 316.21 & 853.778 \\ 107.565 & 284.641 & 403.559 & 632.419 & 1.708 \cdot 10^3 \\ 322.695 & 853.924 & 1.211 \cdot 10^3 & 1.897 \cdot 10^3 & 5.123 \cdot 10^3 \\ 699.172 & 1.85 \cdot 10^3 & 2.623 \cdot 10^3 & 4.111 \cdot 10^3 & 1.11 \cdot 10^4 \end{bmatrix} \cdot lb$$

Reference [3] configuration:

$\rho_{copper} := 8940 \cdot \frac{kg}{m^3}$ $\rho_{copper} = 558.106 \cdot \frac{lb}{ft^3}$ density of copper from [3]

$E_{copper} := 117 \cdot 10^9 \cdot Pa$ $E_{copper} = 1.697 \cdot 10^7 \cdot \frac{lb}{in^2}$ Modulus of Elasticity for copper from [3]

$\nu_{copper} := 0.34$ Poisson's ratio for copper from [3]

$a_{copper} := \sqrt{\frac{E_{copper} \cdot g}{\rho_{copper}}}$ speed of sound in copper from [1]

$a_{copper} = 1.187 \cdot 10^4 \cdot \frac{ft}{sec}$

$OD_{copper} := 26 \cdot mm - 2 \cdot 1.27 \cdot mm$ $OD_{copper} = 0.924 \cdot in$ pipe OD from [3]

$t_{copper} := 1.27 \cdot mm$ $t_{copper} = 0.05 \cdot in$ pipe wall from [3]

$ID_{copper} := OD_{copper} - 2 \cdot t_{copper}$ $ID_{copper} = 0.824 \cdot in$ pipe ID

$A_{f_copper} := \pi \cdot \frac{ID_{copper}^2}{4}$ $A_{f_copper} = 0.533 \cdot in^2$ pipe flow area

$A_{m_copper} := \pi \cdot \frac{OD_{copper}^2}{4} - A_{f_copper}$ pipe metal cross sectional area

$j := 0 .. 1$

$L_{copper_j} :=$

$\begin{bmatrix} 7.65 \cdot m \\ 12.27 \cdot m \end{bmatrix}$ $L_{copper} = \begin{bmatrix} 25.098 \\ 40.256 \end{bmatrix} \cdot ft$ typical copper lengths from [3]

$M_{copper_j} := \left(A_{m_copper} \cdot L_{copper_j} \cdot \rho_{copper}\right)$

$M_{copper} = \begin{bmatrix} 13.349 \\ 21.411 \end{bmatrix} \cdot lb$

$K_{copper} := 90000 \cdot \frac{newton}{m}$ $K_{copper} = 513.925 \cdot \frac{lbf}{in}$

Most SW lines have lateral restraints with stiffnesses on the order of 10^5 lb/in. A comparison is made using the damping coefficient shown below from reference [5]. A large damping coefficient indicates less potential for large oscillations in pressure at changes in direction. The phenomena being dampened here is the conversion of fluid pressure energy into structural kinetic energy (pipe movement) and the subsequent conversion of the kinetic energy back to internal pressure energy.

$$\mathrm{Damp}(\rho, C, A, K, M) := \frac{\rho \cdot C \cdot A}{2 \cdot \sqrt{K \cdot M}}$$

where
ρ = fluid density
C = fluid sonic velocity
A = cross sectional area of pipe
K = flexural stiffness
M = mass of pipe

The damping coefficients for copper are then:

$$D_{copper_j} := \mathrm{Damp}\left(\rho_{wtr}, a_{wtr}, A_{f_copper}, K_{copper}, M_{copper_j}\right)$$

The damping coefficients for the steel are calculated next:

$$n := 0..3$$

$$D_{steel_{n,i}} := \mathrm{Damp}\left(\rho_{wtr}, a_{wtr}, A_{f_i}, K, M_{n,i}\right)$$

The steel and copper results are compared below:

$$D_{steel} = \begin{array}{c} \begin{array}{ccccc} 4" & 8" & 10" & 14" & 24" \end{array} \\ \begin{bmatrix} 0.104 & 0.252 & 0.334 & 0.457 & 0.827 \\ 0.074 & 0.178 & 0.236 & 0.323 & 0.585 \\ 0.043 & 0.103 & 0.136 & 0.187 & 0.338 \\ 0.029 & 0.07 & 0.093 & 0.127 & 0.229 \end{bmatrix} \end{array}$$

$L_0 = 5 \cdot ft$
$L_1 = 10 \cdot ft$
$L_2 = 30 \cdot ft$
$L_3 = 65 \cdot ft$

$$D_{copper} = \begin{bmatrix} 0.159 \\ 0.126 \end{bmatrix}$$

$L_{copper_0} = 25.098 \cdot ft$
$L_{copper_1} = 40.256 \cdot ft$

The majority of SW system configurations have greater damping than the configuration evaluated in reference [3] and are less likely to experience pressure oscillations and fluid/structure interaction effects.

Next a comparison of piping frequencies is made:

$$\omega_N(L, E, I, M) := \frac{\pi^2}{L^2} \cdot \sqrt{\frac{E \cdot I \cdot g}{\frac{M}{L}}}$$

this is the circular fundamental natural frequency of the pipe [6]
where
L = length of pipe
E = modulus of elasticity of the pipe
I = moment of inertia
M = mass of the pipe

$$\omega_1(\omega_{nat}, v, v_{crit}) := \omega_{nat} \cdot \sqrt{1 - \left(\frac{v}{v_{crit}}\right)^2}$$

this is the first natural frequency of the pipe with flow in it [6]
where:
ω_{nat} = circular fundamental natural frequency
v = fluid velocity in the pipe
v_{crit} = critical velocity of flow for buckling the pipe

$$v_c(L, E, I, \rho, A) := \frac{\pi}{L} \cdot \sqrt{\frac{E \cdot I \cdot g}{\rho \cdot A}}$$

this is the critical velocity of flow for buckling the pipe [6]
where
ρ = fluid density
A = fluid flow area

$$\text{Inertia}(OD, ID) := \frac{\pi}{64} \cdot \left(OD^4 - ID^4\right)$$

moment of inertia from Marks

$$I_{steel_i} := \text{Inertia}\left(OD_i, ID_i\right)$$

$$\omega n_{steel_{n,i}} := \omega_N\left(L_n, E_{steel}, I_{steel_i}, M_{n,i}\right)$$

$$v_{crit_steel_{n,i}} := v_c\left(L_n, E_{steel}, I_{steel_i}, \rho_{wtr}, A_{f_i}\right)$$

$$I_{copper} := \text{Inertia}\left(OD_{copper}, ID_{copper}\right)$$

$$\omega n_{copper_j} := \omega_N\left(L_{copper_j}, E_{copper}, I_{copper}, M_{copper_j}\right)$$

$$v_{crit_copper_j} := v_c\left(L_{copper_j}, E_{copper}, I_{copper}, \rho_{wtr}, A_{f_copper}\right)$$

$$\omega n_{steel} = \begin{bmatrix} 824.028 & 1.604\cdot10^3 & 2.006\cdot10^3 & 2.619\cdot10^3 & 4.501\cdot10^3 \\ 206.007 & 400.92 & 501.385 & 654.706 & 1.125\cdot10^3 \\ 22.89 & 44.547 & 55.709 & 72.745 & 125.032 \\ 4.876 & 9.489 & 11.867 & 15.496 & 26.634 \end{bmatrix} \cdot Hz$$

$$\omega n_{copper} = \begin{bmatrix} 4.794 \\ 1.864 \end{bmatrix} \cdot Hz$$

$$v_{crit_steel} = \begin{bmatrix} 1.852\cdot10^3 & 2.958\cdot10^3 & 3.508\cdot10^3 & 4.379\cdot10^3 & 7.174\cdot10^3 \\ 926.115 & 1.479\cdot10^3 & 1.754\cdot10^3 & 2.189\cdot10^3 & 3.587\cdot10^3 \\ 308.705 & 493.003 & 584.732 & 729.765 & 1.196\cdot10^3 \\ 142.479 & 227.54 & 269.876 & 336.815 & 551.812 \end{bmatrix} \cdot ft\cdot sec^{-1}$$

$$v_{crit_copper} = \begin{bmatrix} 58.797 \\ 36.658 \end{bmatrix} \cdot ft\cdot sec^{-1}$$

$$\omega_1_steel_{n,i} := \omega_1\left(\omega n_{steel_{n,i}}, 10\cdot\frac{ft}{sec}, v_{crit_steel_{n,i}}\right)$$

$$\omega_1_copper_j := \omega_1\left(\omega n_{copper_j}, 10\cdot\frac{ft}{sec}, v_{crit_copper_j}\right)$$

$$\omega_1_steel = \begin{bmatrix} 824.016 & 1.604\cdot10^3 & 2.006\cdot10^3 & 2.619\cdot10^3 & 4.501\cdot10^3 \\ 205.995 & 400.911 & 501.376 & 654.699 & 1.125\cdot10^3 \\ 22.878 & 44.538 & 55.701 & 72.738 & 125.028 \\ 4.864 & 9.48 & 11.859 & 15.489 & 26.63 \end{bmatrix} \cdot Hz$$

$$\omega_1_copper = \begin{bmatrix} 4.724 \\ 1.793 \end{bmatrix} \cdot Hz$$

$$f_{o_o}(order, sonic, Length) := \frac{order \cdot sonic}{2 \cdot Length}$$ open-open systems [6]
where
order = 1,2,3,...

$$f_{o_c}(order, sonic, Length) := \frac{order \cdot sonic}{4 \cdot Length}$$ open-closed systems [6]
where order = 1,3,5

$$f_{o_o}\left(1, 2300 \cdot \frac{ft}{sec}, 400 \cdot ft\right) = 2.875 \cdot Hz$$ pulse frequency of SW piping system

$$f_{o_c}\left(1, 4000 \cdot \frac{ft}{sec}, 48 \cdot m\right) = 6.35 \cdot Hz$$ pulse frequency of copper test

It is apparent that the frequency of the source of the displacements is equal to or greater than the frequency of the piping system for the copper case. It is apparent that the frequency of the source of the displacement is less than the frequency of the piping system for typical SW systems. The frequency of typical SW systems is larger than the reference [3] test configuration. It is unlikely that typical SW systems would experience the pressure amplification described in ref. [3] considering these comparisons.

THE COPPER TEST ARRANGEMENT IS THINNER AND MORE SUSCEPTIBLE TO STRAIN THAN SW SYSTEMS AS WELL. THIS RESULTS IN A HIGHER PROBABILITY OF BREATHING EFFECTS AS WELL.

References

[1] Wiggert, Stuckenbruck, & Otwell, "The Influence of Pipe Motion on Acoustic Wave Propogation", Journal of Fluids Engineering, December 1985, Vol. 107.
[2] Mark's Standard Handbook for Mechanical Engineers, Ninth Edition.
[3] Wiggert, Otwell, & Hatfield, "The Effect of Elbow Restraint on Pressure Transients", Transactions of The ASME, Vol. 107, September 1985.
[4] Crane Technical Paper 410, 25th printing.
[5] Moody, Introduction to Unsteady Thermofluid Mechanics, 1990, John Wiley & Sons.
[6] Blevins, Flow Induced Vibration, 1990, Van Nostrand Reinhold.

APPENDIX G. CIWH

This appendix determines the magnitudes of the Condensation Induced Waterhammers (CIWH) that will occur during system draining for the combined LOOP/LOCA event. This method is in general agreement with that described in NUREG CR/5220 [16]. CIWH is expected to occur as hot steam generated in the Fan Coolers enters horizontal piping. The stratified condition with steam passing over the sub-cooled water in the pipe presents the potential for transition to slug flow, trapping a steam bubble. This trapped steam bubble will rapidly condense, drawing water into the void which will impact as the void completes condensation. This impact is a condensation induced waterhammer and produces a pressure pulse that travels through the water solid portion of the pipe. The pressure pulse can lead to differential pressure forces in pipe segments and therefore load the pipe. A diagram of a condensation induced event is presented in Figure G-1 (from NUREG/CR-6519 [13]), below.

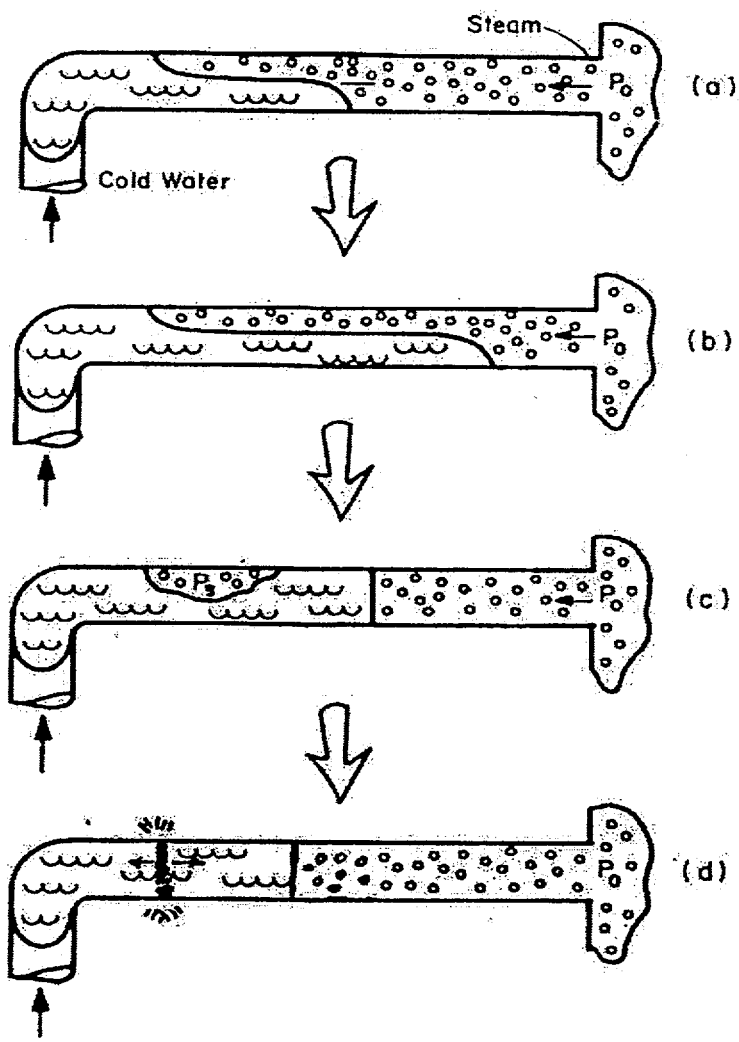


Figure G-1: Condensation Induced Waterhammer

The primary driving force for the CIWH is the differential pressure between the system steam and the void pressure. The acceleration of the water into the void is determined from an energy balance Ref. [13].

$$\frac{1}{2}\rho_L(Vol_L)V^2=(P_o-P_v)Vol_b$$

Where:

Vol_L, Vol_b	=	Volumes of the water slug and steam bubble, respectively
ρ_L	=	density of liquid
V	=	velocity
P_o	=	system driving pressure
P_v	=	pressure in void

As an approximation, the relative steam and water volumes can be related to the average void fraction (α) by:

$$\frac{Vol_b}{Vol_L}=\frac{\alpha}{1-\alpha}$$

The velocity term (V) is therefore:

$$\Delta V = V = \sqrt{\frac{2(P_o-P_v)}{\rho_L}\frac{\alpha}{1-\alpha}}$$

If the entire velocity is instantly stopped at impact ($V = \Delta V$), the waterhammer pressure magnitude can then be determined using the Joukowski equation [13, 31]:

$$\Delta P = k\,\rho\,C\Delta V$$

Where:

ΔP	= waterhammer pressure pulse magnitude (psf, correct to psi)
k	= constant (0.5 for water/water closure, 1.0 for water/valve or end closure)
ρ	= density of the liquid ($lb/ft^3/g$, g = 32.2 ft/sec)
C	= sonic velocity (2300 ft/sec per Appendix H)
ΔV	= impact velocity (ft/sec)

To determine the inputs to the above formulae, the conditions at the time of waterhammer need to be defined. The screening for a CIWH event (Section 5.4) did not consider the beneficial effects of steam condensation during a draining transient. Since the void fraction of steam to total section, α, can vary along with the pressure in the void and both impact the calculated slug impact velocity, this investigation considers steam condensation. As the system drains and the steam void enters a horizontal pipe, the condensation surface will increase and much of the mass of steam in the void will be consumed. This condensation will lower the steam pressure. Conversely, heat added to the steam void will increase the temperature and therefore the steam pressure. The calculation on the attached sheets shows that the steam condensation rate will far outpace the heat addition, and the steam void will stabilize at about 127°F. Therefore, the saturation pressure at this temperature will determine the driving force for the condensation induced waterhammer.

The calculation for the temperature in the void and resulting maximum waterhammer is included on the following pages and the results are summarized below. To conservatively maximize the waterhammer, the following inputs are used:

α = 0.5, As the pipe becomes drained beyond this point, the transition to slug flow is unlikely [13, 14, 15]

ρ_L = density of liquid (use lb/ft^3 at 100°F to maximize waterhammer and 60 lb/ft^3 to maximize impact velocity)

P_o = system driving pressure. Conservatively use saturation pressure at 130°F (2.22 psia)

P_v = pressure in void. Conservatively use the pressure for the minimum water temperature (1.35 psia)

k = 0.5 [13, 31]

$$\Delta V = V = \sqrt{\frac{2(P_o - P_v)}{\rho_L}\frac{\alpha}{1-\alpha}} = \sqrt{\frac{2(144)(2.084-1.622)}{60/32.2}\cdot\frac{.654}{1-.654}} = 11.5 \text{ ft/sec}$$

$$\Delta P = k\,\rho\,C\Delta V$$

$$\Delta P = 1/2\ (62/g)(2300/144)(11.59) = 178 \text{ psi}$$

The pressure duration is calculated by determining the time it takes the sonic wave to travel from the impact point to the free end of the moving slug and back. Using a void ratio of .5 the moving slug length is assumed to be equal to half of the length of the horizontal piping in the slug closing region.

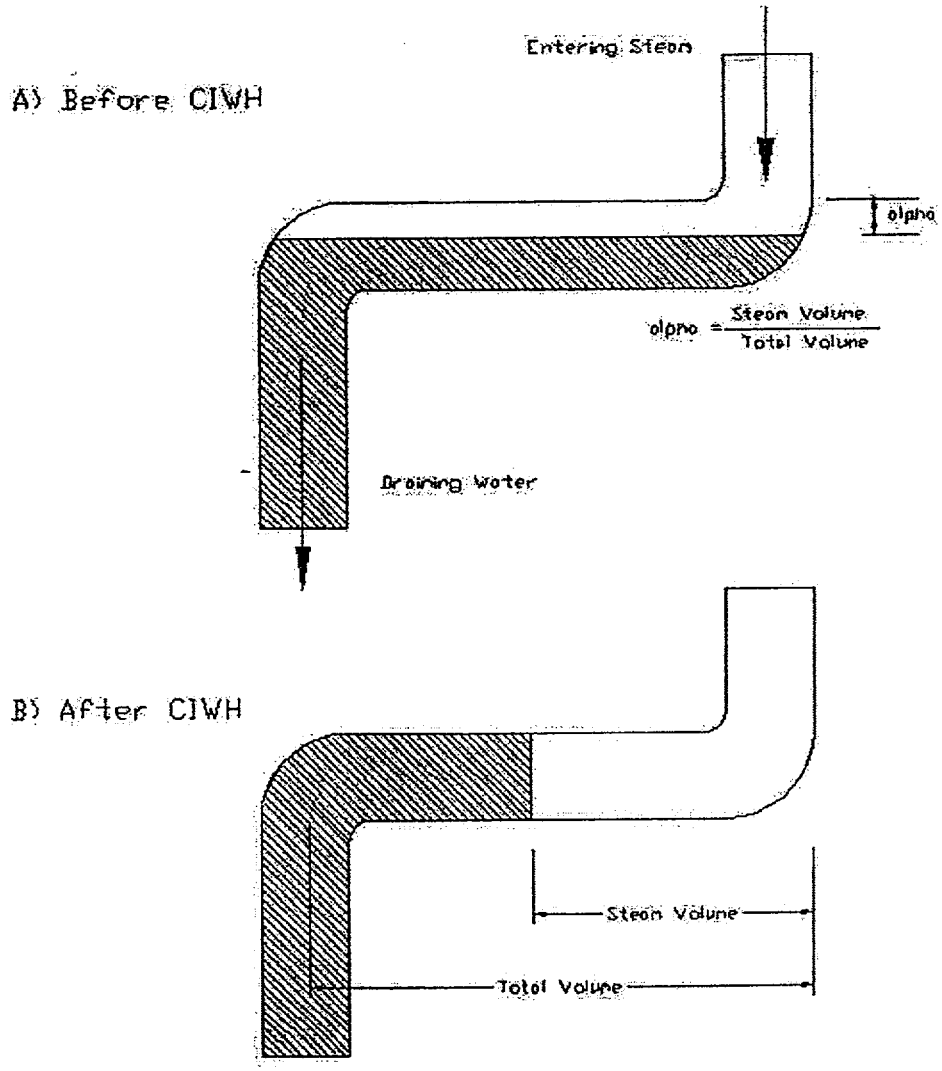


Figure G-2: Water Column Length

Train A (Ref. C-1) has a horizontal pipe length of 78.41 ft (Segments 1, 5, 6, and 7). Hence, the assumed length of the moving slug is 39.2 ft. With a sonic velocity of 2300 fps this results in a pressure pulse duration of 0.0341 seconds for Train A CIWH as noted below:

Duration = 39.2 x 2 / 2300 = 0.0341 seconds
Pulse rise time = 0.0341 / 2 = 0.0170 seconds

Train B (Ref. C-1) has a horizontal pipe length of 61.93 ft (Segment 11). Hence, the assumed length of the moving slug is 31.0 ft. With a sonic velocity of 2300 fps this results in a pressure pulse duration of 0.0270 seconds for Train B CIWH as noted below:

Duration = 31.0 x 2 / 2300 = 0.0270 seconds
Pulse rise time = 0.0270/2 = 0.0135 seconds

The pulse rise time is limited to the time that the sonic wave can reach the free surface. Since the free surface is very close to the closure location, the shape of the pressure pulse is triangular. The triangular pulse shape can be seen in the test data for pump restart (CCWH), and it is even more likely for the shorter CIWH events.

This calculation determines the temperature in the steam void as a horizontal pipe drains and the void fraction increases. The steam void temperature is a function of condensation removing mass at the water interface while heat is being added at the heat exchanger as shown in Equation 1. The heat exchanger heat transfer and condensation heat transfer are expressed in Equations 2 and 3, respectively. This supplementary calculation shows behaviour of the steam void after the pressurization occurs as calculated in Appendix A.

Heat Balance: $$M_S \cdot Cp_S \cdot \frac{d}{dt} T_S = Q_{IN} - Q_{OUT}$$ Eq (1)

Heat Exchanger Heat Transfer: $$Q_{IN} = U_{HX} \cdot A_{HX} \cdot (T_C - T_S)$$ Eq (2)

Condensation Heat Transfer: $$- Q_{OUT} = U_{CDS} \cdot A_{CDS} \cdot (T_S - T_W)$$ Eq (3)

At any time t_i the steam temperature Ts_i is then calculated by combining Eq (1), (2), and (3):

$$T_{S_i} = T_{S_{i-1}} + \frac{\Delta t}{M_{S_{i-1}} \cdot Cp_{S_{i-1}}} \cdot \left[U_{HX} \cdot A_{HX} \cdot \left(T_C - T_{S_{i-1}}\right) - U_{CDS} \cdot A_{CDS_{i-1}} \cdot \left(T_{S_{i-1}} - T_W\right) \right]$$ Eq (4)

Definition of terms:

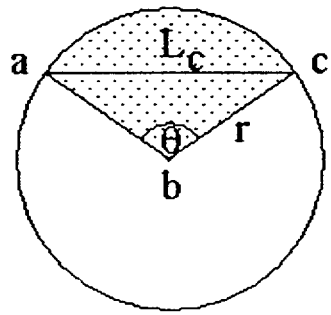
- T_S = Temperature of steam
- Δt = time step
- M_S = Mass of steam in the void
- Cp_S = Specific heat of steam
- U_{HX} = Overall heat transfer coefficient for heat exchanger
- A_{HX} = Heat transfer area for heat exchanger
- T_C = Containment temperature
- U_{CDS} = Condensation heat transfer coefficient
- A_{HX} = Condensation heat transfer surface area
- T_W = Condensation surface temperature

THIS COMPUTERIZED CALCULATION HAS BEEN CONFIRMED BY:

- [x] DETAILED CHECKING OF ALL FORMULATION
- [ ] COMPARISON TO AN IDENTICAL VERIFIED FILE IN:

BY: GZ DATE: 12/11/00

The condensation heat transfer area is conservatively assumed to just be the water surface area (i.e. cold piping not credited). The condensation surface area is developed below. A direct solution method is not readily available to solve for the area formed by the chord length and the pipe segment length. The area is determined by first solving for the angle θ shown in the figure below. Then the chord length is calculated from simple geometry. The angle θ is solved for at any void fraction by using a subroutine that guesses the value of θ, then calculates the voided area using the guess value and compares the calculated area against the known voided area (Avoid = α X Apipe). Guesses continue until the guess value area exceeds the voided area. By applying a small change in the angle at each guess, error is negligible.

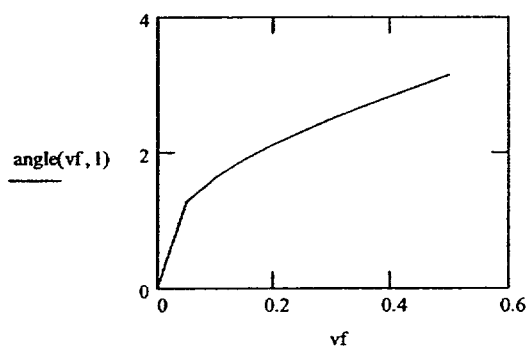


$$\text{angle}(\alpha, r) := \left| \begin{array}{l} A_{calc} \leftarrow 0 \\ \text{step} \leftarrow \dfrac{1}{10^4} \\ \theta \leftarrow \text{step} \\ A_{void} \leftarrow \alpha \cdot \pi \cdot r^2 \\ \text{while } A_{void} > A_{calc} \\ \quad \left| \begin{array}{l} A_{calc} \leftarrow \dfrac{r^2}{2} \cdot (\theta - \sin(\theta)) \text{ if } \theta \le \dfrac{\pi}{2} \\ A_{calc} \leftarrow \dfrac{r^2}{2} \cdot (\theta - \sin(\pi - \theta)) \text{ otherwise} \\ \theta \leftarrow \theta + \text{step} \end{array} \right. \\ \theta \end{array} \right.$$

$$L_{chord}(\alpha, r) := 2 \cdot r \cdot \sin\left(\frac{\text{angle}(\alpha, r)}{2}\right)$$

$$vf := 0, 0.05 .. .5$$

$$A_{CDS}(L_{pipe}, \alpha, ID) := L_{chord}\left(\alpha, \frac{ID}{2}\right) \cdot L_{pipe}$$



A low condensing heat transfer coefficient is assumed:

$$U_{CDS} := 5000 \cdot \frac{BTU}{hr \cdot ft^2 \cdot degF}$$

Liang & Griffith's paper "Experimental and analytical study of direct contact condensation of steam in water", August 1991, Nuclear Engineeing and Design indicates that direct contact heat transfer coefficients can reach 10^3 kW/m^{2}K (176,000 BTU/hr ft^2 R). This is significantly greater than the 5000 BTU/hr ft^2 R applied herein. Uncetrainty here is bound by ignoring the piping metal as an available heat sink (see margin assessment shown below).

The heat exchanger heat transfer area is calculated below.

$n_{tubes} := 384$ per 96227-TR-01

$L_{tubes} := 54 \cdot ft$ ""

$OD := \frac{5}{8} \cdot in$ ""

$A_{HX} := n_{tubes} \cdot L_{tubes} \cdot \pi \cdot OD$ $A_{HX} = 3392.92\ ft^2$

Steam and water properties are taken from Incropera & Dewitt.

The highest steam pressure in the horizontal headers of concern is 8.2 psia per Appendix A of 96227-TR-01

$P_{So} := 8.2 \cdot psi$

$T_{So} := valueP(P_{So}, T)$ $T_{So} = 184.01\ degF$ sensitivity was evaluated and high temp results in conservatively high convective heat transfer in HX

$Pr_{So} := valueT(T_{So}, Pr_g)$ $Pr_{So} = 0.96$

$\mu_{So} := valueT(T_{So}, \mu_g)$ $\mu_{So} = 0\ poise$

$\rho_{So} := valueT(T_{So}, v_g)^{-1}$ $\rho_{So} = 0.02 \frac{lb}{ft^3}$

$k_{So} := valueT(T_{So}, K_g)$ $k_{So} = 0.01 \frac{BTU}{hr \cdot ft \cdot degF}$

$Cp_{So} := valueT(T_{So}, C_{pg})$ $Cp_{So} = 0.47 \frac{BTU}{lb \cdot degF}$

$V_S := 50 \cdot \frac{ft}{sec}$ a conservatively high steam velocity is assumed; note that negligible steam velocities are expected since no water is available for steam generation.

$Re_S := \frac{OD \cdot V_S \cdot \rho_{So}}{\mu_{So}}$ $Re_S = 7354.08$ Reynolds number

$Nu_S := 0.023 \cdot Re_S^{0.8} \cdot Pr_{So}^{0.4}$ $Nu_S = 27.99$ Nusselt number

$U_{HX} := \frac{Nu_S \cdot k_{So}}{OD}$ $U_{HX} = 7.3 \frac{BTU}{hr \cdot ft^2 \cdot degF}$

The available steam volume is calculated:

$V_{HX} := 103.7 \cdot ft^3$ per 96227-TR-01 (page 18) for two coolers

$V_{pipeA} := (9.3 + 32.8 + 10.8 + 64.2 + 75.2) \cdot ft^3$ train A piping volume down to but not including piping at elevation 2018'8" where CIWH may occur

$V_{pipeB} := (18.71 + 61.96 + 78.84) \cdot ft^3$ train B piping volume down to but not including piping at elevation 2027' 6" where CIWH may occur

$$V_{pipe} := \begin{cases} V_{pipeA} & \text{if } V_{pipeA} < V_{pipeB} \\ V_{pipeB} & \text{otherwise} \end{cases}$$

$V_{pipe} = 159.51\, ft^3$ the smaller piping volume is applied to ensure a conservatively bounding volume is used

$V_{total} := V_{pipe} + V_{HX}$ $V_{total} = 263.21\, ft^3$

An assessment is made of the margin that is available by not accounting for condensation on piping:

for 14" piping, the equivalent length of piping is:

$$L_{pipe} := \frac{V_{total}}{0.9394 \cdot ft^2} \quad L_{pipe} = 280.19\, ft$$

the mass of steel in the piping is:

$$M_{metal} := L_{pipe} \cdot 490 \cdot \frac{lb}{ft^3} \cdot 18.66 \cdot in^2 \quad M_{metal} = 17790.86\, lb$$

the metal can absorb the following average heat assuming the temperature drops proportionally with time:

$$Q_{metal} := M_{metal} \cdot 0.11 \cdot \frac{BTU}{lb \cdot degF} \cdot \frac{(278 - 110) \cdot degF}{37 \cdot sec} \cdot \frac{1}{2} \quad Q_{metal} = 1.6 \times 10^7 \frac{BTU}{hr}$$

the heat exchanger is capable of transferring upto the following heat when its empty:

$$Q_{hxmax} := U_{HX} \cdot A_{HX} \cdot (278 - 110) \cdot degF \cdot \frac{1}{2} \quad Q_{hxmax} = 2.08 \times 10^6 \frac{BTU}{hr}$$

the metal is capable of absorbing all the heat generated in the heat exchanger during the transient

the available margin is then: $\frac{Q_{metal}}{Q_{hxmax}} = 7.69$

In other words the heat transfer rates herein are conservative by a factor of approximately seven just as a result of not crediting the heat removal by piping.

The initial steam mass in the system is then:

$M_{So} := \rho_{So} \cdot V_{total}$ $M_{So} = 5.69\, lb$

The drainage rates when the horizontal headers of concern are encountered are taken from Appendix A of 96227-TR-01:

$Q_A := 2500 \cdot \frac{gal}{min}$ nominal flow rate for supply & return headers

$Q_B := 3100 \cdot \frac{gal}{min}$ nominal flow rate for supply & return headers

$Q_A := \frac{1}{2} \cdot Q_A$ horizontal header of concern has half total flow considering only return or supply side

$Q_B := \frac{1}{2} \cdot Q_B$ " "

$Q_A = 1250 \frac{gal}{min}$

$Q_B = 1550 \frac{gal}{min}$

$ID_A := 13.124 \cdot in$ internal diameter of A train return piping header of concern

$ID_B := 10.02 \cdot in$ internal diameter of B train return piping header of concern

$Vol_A := 142.3 \cdot ft^3$ train A piping volume at 2018' 8" elevation from page 19 of 96227-TR-01

$Vol_A := \frac{1}{2} \cdot Vol_A$ since only supply or return piping being evaluated

$Vol_B := 144.8 \cdot ft^3$ train B piping volume at 2027' 6" elevation from page 20 of 96227-TR-01

$Vol_A := \frac{1}{2} \cdot Vol_B$ since only supply or return being evaluated

$time_A := \frac{Vol_A}{Q_A}$ simulation time for A train

$time_B := \frac{Vol_B}{Q_B}$ simulation time for B train

$time_A = 26\,sec$

$time_B = 41.93\,sec$

$dt := 0.01 \cdot sec$ $\quad d\alpha A := \frac{dt}{time_A}$ $\quad d\alpha A = 0$

$d\alpha B := \frac{dt}{time_B}$ $\quad d\alpha B = 0$

The minimum water temperature in the header is considered to be the mixed water temperature shown on page 31 of 96227-TR-01.

$T_W := 112 \cdot degF$

$Mw_A := Vol_A \cdot valueT(T_W, v_f)^{-1}$ $\quad Mw_B := Vol_B \cdot valueT(T_W, v_f)^{-1}$

$Mw_A = 4474.73\,lb$ $\quad Mw_B = 8949.46\,lb$

The highest possible containment temperature is found from Appendix A of 96227-TR-01:

$T_C := 278 \cdot degF$

$$T_{S_i} = T_{S_{i-1}} + \frac{\Delta t}{M_{S_{i-1}} \cdot Cp_{S_{i-1}}} \cdot \left[U_{HX} \cdot A_{HX} \cdot \left(T_C - T_{S_{i-1}}\right) - U_{CDS} \cdot A_{CDS_{i-1}} \cdot \left(T_{S_{i-1}} - T_W\right) \right]$$

$$\text{transient}(t_{max}, d\alpha, ID, vol, Mass) :=$$

$$i \leftarrow 0$$

$$Ts_i \leftarrow T_{So}$$

$$Tw_i \leftarrow T_W$$

$$Ms_i \leftarrow M_{So}$$

$$Cps_i \leftarrow Cp_{So}$$

$$L \leftarrow \frac{vol}{\frac{\pi}{4} \cdot ID^2} \cdot in^{-1}$$

$$VF_i \leftarrow 0$$

$$Acds_i \leftarrow A_{CDS}\left(L, VF_i, \frac{ID}{in}\right) \cdot in^2$$

$$t_i \leftarrow 0 \cdot sec$$

$$Qin_i \leftarrow U_{HX} \cdot A_{HX} \cdot (T_C - Ts_i)$$

$$Qout_i \leftarrow U_{CDS} \cdot Acds_i \cdot (Ts_i - T_W)$$

$$\text{while } t_i < t_{max} \cdot sec$$

$$i \leftarrow i + 1$$

$$Qin_i \leftarrow U_{HX} \cdot A_{HX} \cdot (T_C - Ts_{i-1})$$

$$Qout_i \leftarrow U_{CDS} \cdot Acds_{i-1} \cdot (Ts_{i-1} - Tw_{i-1})$$

$$Ts_i \leftarrow Ts_{i-1} + \frac{dt}{Ms_{i-1} \cdot Cps_{i-1}} \cdot (Qin_i - Qout_i)$$

$$Tw_i \leftarrow Tw_{i-1} + \frac{Qout_i \cdot dt}{(1 - VF_{i-1}) \cdot Mass \cdot 1 \cdot \frac{BTU}{lb \cdot degF}}$$

$$Ts_i \leftarrow Tw_i \text{ if } Ts_i < Tw_i$$

$$Ts_i \leftarrow T_C \text{ if } Ts_i > T_C$$

$$VF_i \leftarrow VF_{i-1} + d\alpha$$

$$Acds_i \leftarrow A_{CDS}\left(L, VF_i, \frac{ID}{in}\right) \cdot in^2$$

$$\rho s \leftarrow \text{valueT}(Ts_i, v_g)^{-1}$$

$$Cps_i \leftarrow \text{valueT}(Ts_i, C_{pg})$$

$$Ms_i \leftarrow \rho s \cdot V_{total}$$

$$t_i \leftarrow t_{i-1} + dt$$

$$return_0 \leftarrow \frac{t}{sec}$$

$$return_1 \leftarrow \frac{Ts}{}$$

degF

$return_2 \leftarrow \frac{Qin}{\frac{BTU}{hr}}$

$return_3 \leftarrow \frac{Qout}{\frac{BTU}{hr}}$

$return_4 \leftarrow VF$

$return_5 \leftarrow \frac{Tw}{degF}$

return

$tranA := transient(15, d\alpha A, ID_A, Vol_A, Mw_A)$ $tranB := transient(0.5, d\alpha B, ID_B, Vol_B, Mw_B)$

$tA := tranA_0$ $TsA := tranA_1$ $QinA := tranA_2$ $QoutA := tranA_3$ $VFA := tranA_4$ $TwA := tranA_5$

$tB := tranB_0$ $TsB := tranB_1$ $QinB := tranB_2$ $QoutB := tranB_3$ $VFB := tranB_4$ $TwB := tranB_5$

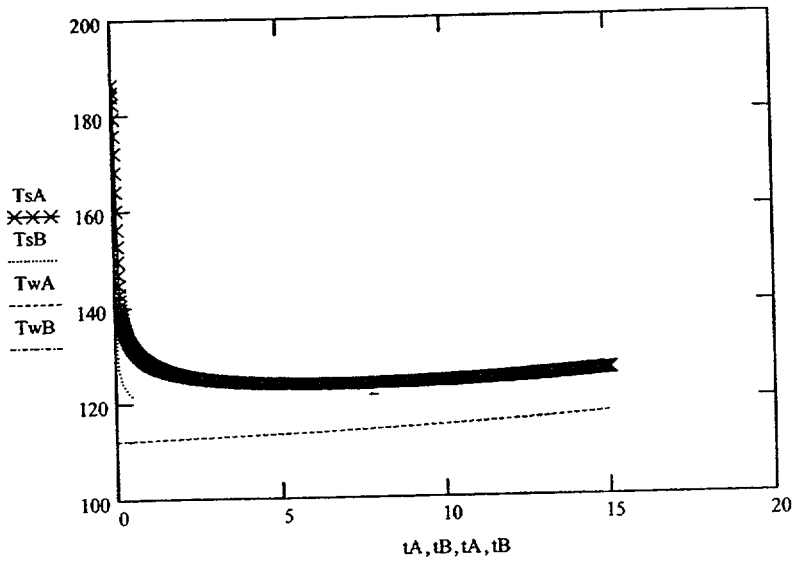
$i := 0 .. rows(tA) - 1$ $PsA_i := valueT(TsA_i \cdot degF, P)$

$PwA_i := valueT(TwA_i \cdot degF, P)$

$$V_{impact_i} := \sqrt{2 \cdot \frac{(PsA_i - PwA_i)}{60 \cdot \frac{lb}{ft^3}} \cdot \frac{VFA_i}{1 - VFA_i}}$$

$V_{max} := max(V_{impact})$ $V_{max} = 9.65 \frac{ft}{sec}$

$\Delta P := \frac{1}{2} \cdot 62 \cdot \frac{lb}{ft^3} \cdot 2300 \cdot \frac{ft}{sec} \cdot V_{max}$ $\Delta P = 148.44\ psi$



$\max(VFA) = 0.577$

$TsA_{1501} = 126.25$ use 130F

$PsA_{1501} = 2.009\,psi$

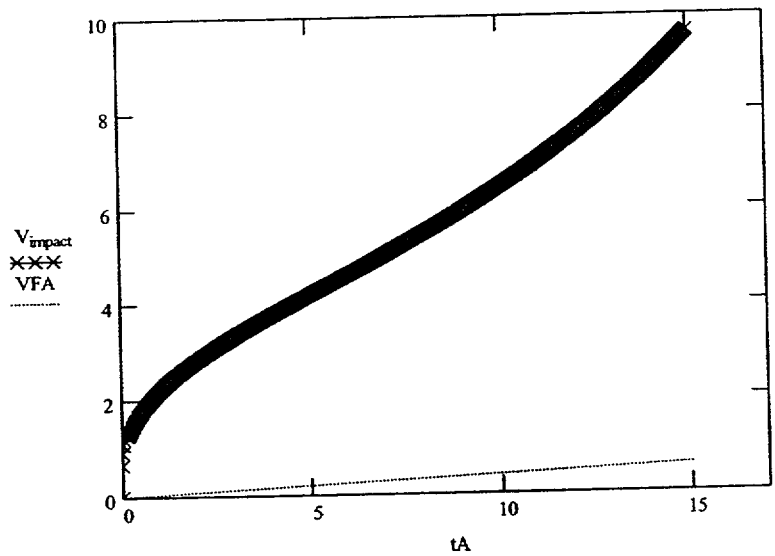
$valueT(130 \cdot F, P) = 2.22\,psi$

$TwA_{1501} = 117.27$ Max water Temp

$\min(TwA) = 112$ Min water Temp

$\min(PwA) = 1.35\,psi$ Min void Press

The "A" train CIWH magnitude is limiting since its steam pressure exceeds the "B" train.



Conservatively using a bounding temperature of 130F (P=2.22 psia) and a minimum void pressure of 1.35 psia:

Impact Velocity:

$$V_{imp} := \sqrt{2 \cdot \frac{(2.22 \cdot psi - 1.35 \cdot psi)}{60 \cdot \frac{lb}{ft^3}} \cdot \frac{.5}{1 - .5}} \qquad V_{imp} = 11.59 \frac{ft}{sec}$$

Pressure Pulse:

$$\Delta P := \frac{1}{2} \cdot 62 \cdot \frac{lb}{ft^3} \cdot 2300 \cdot \frac{ft}{sec} \cdot 11.59 \cdot \frac{ft}{sec} \qquad \Delta P = 178.36\,psi$$

APPENDIX H

This appendix provides additional justification for the sonic velocity used in the calculation of waterhammer magnitudes and pulse travel speeds.

As the Wolf Creek piping system loses pump pressure due to the LOOP event, the local pressure in the system is determined by the relative elevation of the piping and fluid reservoir. As described previously, the local fluid pressure will drop to the saturation point, and vapor voids will form as the system drains. The system will drain to the long horizontal piping located at the 2018' (A train) and 2027' (B train) elevations. The pressure above this level will be the saturation pressure for the liquid vapor.

The Wolf Creek system is a raw water system that will experience evolution of dissolved gases in the water close to the void region. The raw water is saturated with air at atmospheric pressure, and the pressure in the region of the void will approach approximately 2 psia, as discussed in Section 5.7. This represents a significant dissolved gas over-pressure for a fluid which was saturated at atmospheric pressure. This is a condition of super-saturation. The pressure drop, heat transfer leading to steam formation, and water flow cause the dissolved gas to be released, forming tiny bubbles in the liquid. The released air only needs to occupy a relatively small volume to have a significant affect on the sonic velocity, far less than 1% of the liquid volume. A simplified drawing the draining pipe scenario is depicted in Figure H-1.

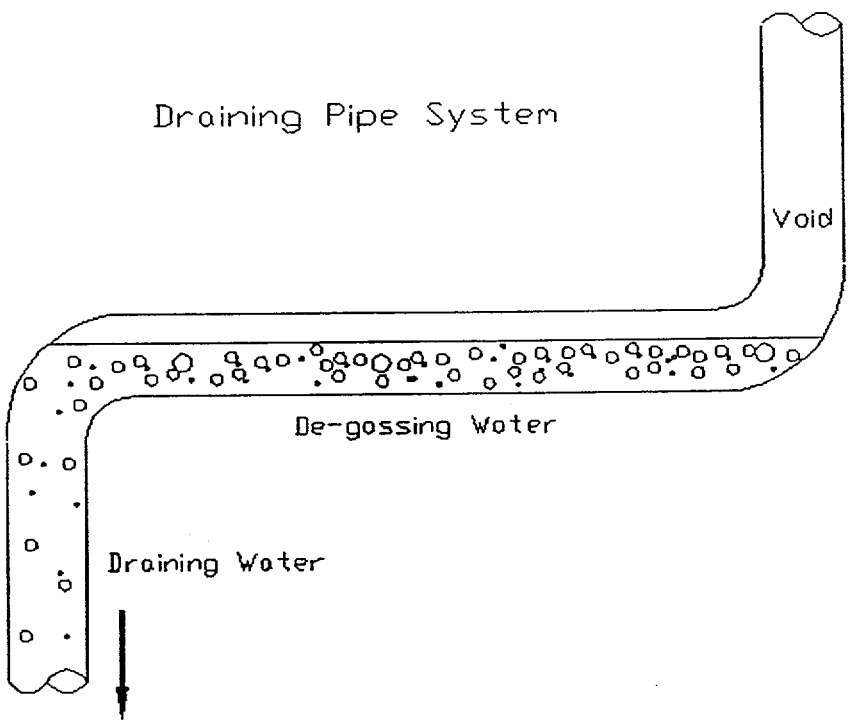


Figure H-1: Draining Pipe System

The release of air is especially acute during the formation of a trapped/condensing steam void during a condensation induced waterhammer event. The local pressure around the trapped void drops so low that the water can become opaque due to tiny air bubbles in the region adjacent to the void. This dynamic release of air can significantly alter the sonic velocity of the water during the bubble collapse event. This can be seen in Figure H-2, obtained from [13].

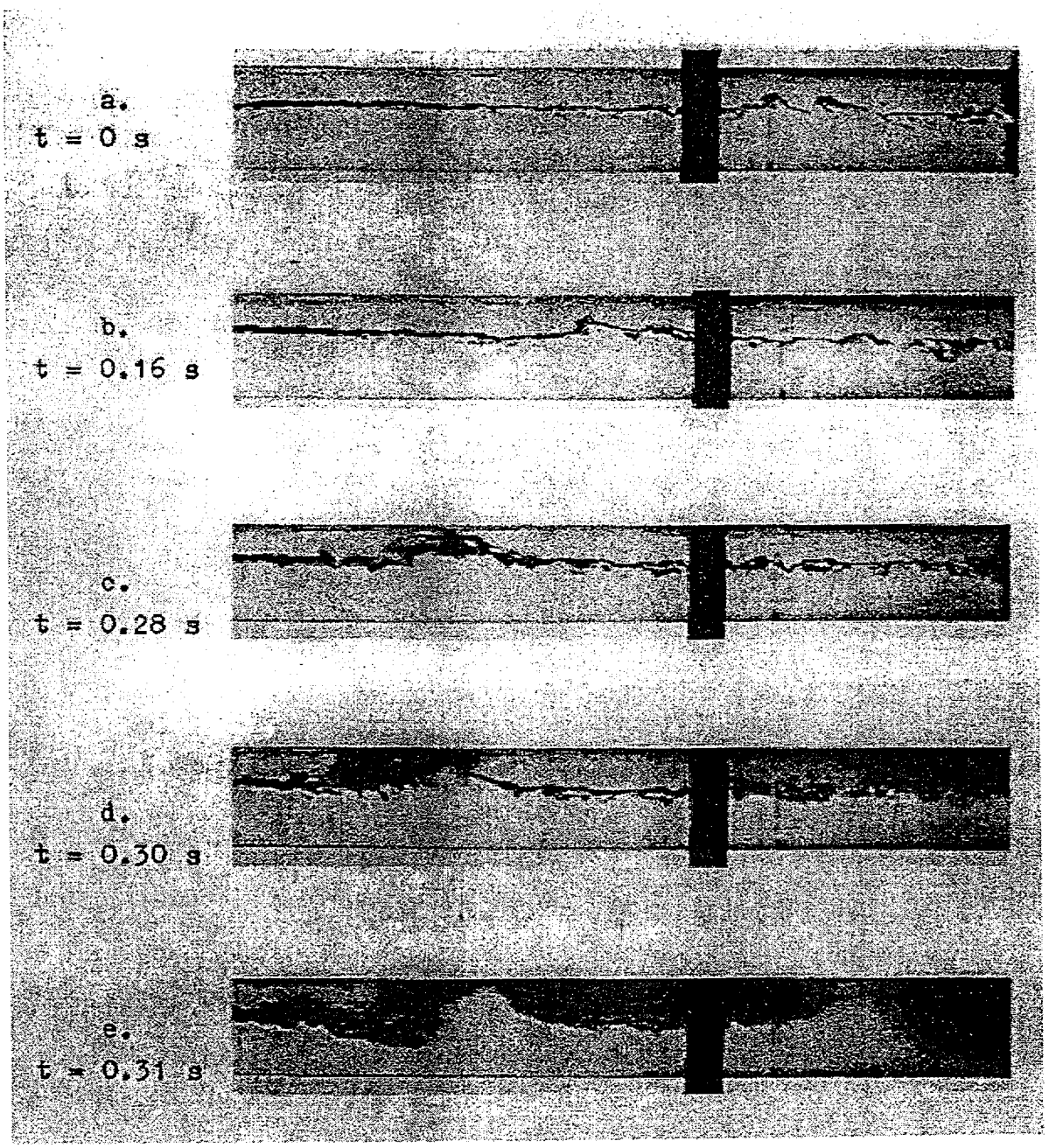


Figure H-2: Condensation Induced Waterhammer/Air Release

The expression for the modified sonic velocity due to the influence of released non-condensable gas is obtained from Wylie and Streeter [31] equation 8-12.

$$a' = \sqrt{\frac{a_{pipe}^2}{1 + m \cdot \rho_L \cdot R_{gas} \cdot T \cdot \frac{a_{pipe}^2}{p_g^2}}}$$

Equation (1)

where:

a'	= sonic velocity with entrained gas (fps)
a_{pipe}	= sonic velocity considering pipe flexibility (fps)
m	= mass of free gas per volume of fluid (lb/ft^3)
ρ_L	= liquid density (lb/ft^3)
R_{gas}	= individual gas constant
T	= liquid temperature (Rankine)
p_g	= partial pressure of the gas (psia)

Since air has such an influence on the sonic velocity and therefore on waterhammer magnitude, a prediction of the release of non-condensables from a depressurized liquid is required. The method used was obtained from *Gas Release in Transient Pipe Flow* which was written by Zielke, Perko, and Keller [32]. The test apparatus for this project consisted of a loop of flowing water that was rapidly depressurized. The evolved air bubbles were measured using optical scattered light and acoustical methods. The results of these tests also showed an exponential relationship for the mass of gas released with the supersaturation of the liquid. This is shown in equation 5 of the referenced paper and is as follows:

$$m_{rate} := k_1 \cdot \frac{(p_e - p_g)}{p_o} \cdot \exp\left(-9.2 \cdot \frac{p_g}{p_e}\right) \cdot Re^{.86}$$

Equation (2)

where:

m_{rate}	= mass release rate of dissolved gas per m^3 of liquid (kg/s m^3)
k_1	= constant based on the pipe diameter $=7.1\times10^{-11}/D^2$ (kg/m^{3}sec)
Re	= Reynolds number

Given enough time, the amount of gas released reaches a maximum value that corresponds to equation 6 of the referenced paper.

$$m_{max} := k_2 \cdot \left(\frac{p_e - p_g}{p_o}\right)^{2.59} \cdot \left(\exp\left(-9.3 \cdot \frac{p_g}{p_e}\right)\right)$$

Equation (3)

where:

m_{max} = maximum free gas concentration reached after the gas release activity phase per m^3 of liquid ($kg/s\ m^3$)

k_2 = constant based on the pipe diameter $=1.8x10^{-4}/D$ (kg/m^3)

Since the gas evolution will reach the maximum value in approximately 15 seconds as shown in the Zielke tests, the more conservative (limiting) Equation 3 will be used.

$p_e := 14.7 \cdot psi$ equilibrium pressure (if saturated at atm, p_e=14.7)

$p_g := 4 \cdot psi$ gas pressure. A low pressure will exist in the fluid near the void. Use 4 psia to capture all fluid within about 5 vertical feet from the 1 psia void.

$p_o := 14.7 \cdot psi$ atmospheric pressure

$D := \frac{8}{39.25}$ Pipe diameter (for 8" pipe, in meters)

$V_L := 5 \cdot \frac{ft}{s}$ Based on typical velocity during the drainage of the system

$\mu := 1225 \cdot 10^{-6} \cdot N \cdot \frac{s}{m^2}$ Viscosity for water at 12C (checks w/ Crane 410 of ~1.3 centipoise)

$\rho_L := 62.4 \frac{lb}{ft^3}$

$Re := \frac{(\rho_L \cdot V_L \cdot D \cdot m)}{\mu}$ $Re = 2.535 \times 10^5$

The total mass release for dissolved gas in a flowing fluid is given by equation 6 and the constant k2:

$k_2 := \frac{1.8 \cdot 10^{-4}}{D} \cdot \frac{kg}{m^3}$

$m_{max} := k_2 \cdot \left[\frac{(p_e - p_g)}{p_o}\right]^{2.59} \cdot \left(\exp\left(-9.3 \cdot \frac{p_g}{p_e}\right)\right)$ $m_{max} = 3.088 \times 10^{-5}\ kg\ m^{-3}$

The mass of gas released per cubic meter of liquid.

Substituting the mass of gas into Equation 1 provides the sonic velocity. It can be seen that the sonic velocity in the (low pressure) region of the void is quite low, and the sonic velocity of 2300 ft/sec is conservative for the determination of pressure pulse magnitude:

$$a'_2 := \sqrt{\frac{a_{pipe}^2}{1 + \left(m_{gas2} \cdot R_{gas} \cdot T_{gas} \cdot \rho_L\right) \cdot \left(\frac{a_{pipe}^2}{p_g^2}\right)}} \qquad a'_2 = 1702 \frac{ft}{s}$$

If one re-evaluates the gas release away from the void, in regions where the hydrostatic pressure is in the order of 10 psia, the mass of gas released is far less:

The total mass release for dissolved gas in a flowing fluid is given by equation 6 and the constant k2:

$$k_2 := \frac{1.8 \cdot 10^{-4}}{D} \cdot \frac{kg}{m^3}$$

$$m_{max} := k_2 \cdot \left[\frac{(p_e - p_g)}{p_o}\right]^{2.59} \cdot \left(\exp\left(-9.3 \cdot \frac{p_g}{p_e}\right)\right) \qquad m_{max} = 8.238 \times 10^{-8} \, kg \, m^{-3}$$

The mass of gas released per cubic meter of liquid.

The resulting sonic velocity is:

$$a'_2 := \sqrt{\frac{a_{pipe}^2}{1 + \left(m_{gas2} \cdot R_{gas} \cdot T_{gas} \cdot \rho_L\right) \cdot \left(\frac{a_{pipe}^2}{p_g^2}\right)}} \qquad a'_2 = 4324 \frac{ft}{s}$$

Therefore, the pressure pulse will travel much faster in the piping at elevations lower than the void interface.

Additional References:

31. Wylie, E. B. and Streeter, V. L., Fluid Transients in Systems, Prentice Hall, 1993.

32. W. Zielke, H-D Perko, and A. Keller, "Gas Flow in Transient Pipe Flow", Pressure Surges-Proceedings of the 6th International Conference pp. 3-14, 1990.