

Remaining lifetime assessment of a polyamide
pressure sheath of the flexible flowline
Header #2 from the Salema field, Brazil



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by

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Summary

At the request of Shell Brasil Exploration and Production, Shell Global Solutions International B.V. was asked to investigate the state of ageing of the polyamide (PA 11) pressure sheath of a flexible flowline header from the Salema field in the Campos Basin. The aim of this study was to determine the remaining life time of the pressure sheath after 4.5 years of operation under the specific Salema field conditions. The investigation consisted of the determination of the Corrected Inherent Viscosity (CIV), the average molecular weight and the measurement of the tensile properties. The measured CIV was used to assess the remaining lifetime of the pressure sheath and the characteristic properties were compared with the properties of a reference PA11 pressure sheath from a new flexible pipe. The remaining lifetime was predicted according the procedure described in API 17TR2, using the provided historical operation data and based on an acceptance criterion for the CIV of 1.1 dL/g, which is recommended for a static application.

The CIV of the pressure sheath of Header #2 was found to be 1.53 dL/g after an operation period of 4.5 year. This is a decrease of about 20 %. This CIV level is far above the API 17TR2 initial acceptance criterion of 1.1 dL/g for flexibles used under static conditions. The strain at break decreased with 27 %, but is still above the minimum acceptable elongation at break of 50% as recommended by API RP17B. The temperature to achieve a CIV value of 1.53 dL/g after 4.5 years and at a pH of 6.5 was calculated to be 68.3 °C.

Assuming a constant future temperature of 70 °C and a constant pH of 6.5, the predicted remaining lifetime will be 13.4 years. This remaining lifetime should be adjusted for the most actual pH value of the production stream. The monitored temperature of the header shows an increasing tendency. It is, therefore, expected that the temperature will increase in future and this will additionally cause a significant decrease of the remaining lifetime.

It is strongly recommended to install PA11 coupons into the production stream (via corrosion cells) and to constantly monitor both the temperature and the pH level close to these coupons.

The coupons should be used to repeat CIV measurements and together with the monitored pH and temperature would enable recalculation of the remaining lifetime.

Amsterdam, June 2010

Table of Contents

Summary	1
1. Introduction	3
1.1 PA11 degradation mechanism	3
1.2 End-of-service life recommendation	3
1.3 Flowline operation history	3
2. Determination of the materials properties of the pressure sheath	5
2.1 Investigated material	5
2.2 Results of material testing	5
2.2.1 Visual inspection during dismantling of the flexibles	5
2.2.2 Preparation samples for testing	5
2.2.3 Corrected Inherent Viscosity (CIV)	6
2.2.4 Molecular weight	6
2.2.5 Tensile properties	6
3. Remaining lifetime assessment based on historical operating data	8
3.1 Input data for the lifetime assessment	8
3.2 Determination of the consumed lifetime	9
3.3 Prediction of the remaining lifetime	9
4. Discussions	9
4.1 Material testing results	9
4.2 Effect of the chemical treatments	10
4.3 Estimated consumed lifetime	10
4.4 Predicted remaining lifetime	11
5. Conclusions	11
6. Recommendations	12
7. References	12
Appendix A. End-of-service life recommendations from EPW Subsea Surveillance Team (SST)	22
Appendix B. Pressure and temperature data of flexible Header #2	25
Appendix C. Salema F pH measurements period September – November 2006	59
Bibliographic Information	60
Report distribution	61

1. Introduction

At the request of Shell Brasil Exploration and Production, Shell Global Solutions International B.V. investigated the ageing state of the polyamide (PA11) pressure sheath of a flexible pipe from the Salema field in the Campos Basin, Brazil. The aim of this study was to determine the remaining life time of the pressure sheath after operation under the specific conditions of the Salema field as appeared during the last 4.5 year.

The flowline had been installed in 2003 and started production in February 2004. Manufacturer of the flexible pipe is Wellstream. The investigated flexible pipe Header #2 was recovered in January 2009 as part of a flowline and riser replacement project that started during a shut-down of the Salema field.

The investigation consists of:

- Determination of characteristic material properties as measure for the polymer degradation.
- Calculation of the remaining lifetime based on the current state of degradation, historical operating data and the initial acceptance criterion of 1.1 dL/g for a static application as documented in API 17TR2 [1].

1.1 PA11 degradation mechanism

Ageing of PA11 in water is a well known problem. PA11 is susceptible to hydrolysis when exposed to water. This is the reaction of free water with the amide links of the polymer molecules to reform the original amine and acid end groups of the former monomer molecules. This reaction is the main degradation mechanism and results in the reduction of the molecular weight (Mw) of the molecules and below a certain threshold level this would lead to embrittlement of the material. Degradation rate of PA11 generally is accelerated by elevated temperature and the acidity of the medium (low pH) to which it is exposed.

Other parameters are the water content in the fluid, the oil composition and the presence of chemical treatments (especially methanol).

1.2 End-of-service life recommendation

In March 2008 theoretical calculations were made for the Estimated Service Life (ESL) of flexible flowlines of the Salema field by the EPW Subsea Surveillance Team (SST). From that calculation they recommended to replace flexible flowlines with date of medio 2009 (Appendix A). These calculations were based on the methodology described in the API Technical Report 17TR2 [1]. Monitored data from four flowlines and risers were used (temperature and pH) as input for the calculations.

With the replacement of the flowlines, representative samples of PA11 are now available which have a well known history. Determination of the physical and mechanical properties should allow the determination of the state of degradation and a more reliable estimation of the remaining life time of the flexibles.

1.3 Flowline operation history

The historical operation data has been provided by SBRASEP¹. Temperature conditions were monitored during the entire service period of Header #2 (Appendix B). After installation Header #2 had a temperature between 21 and 26 °C over a period of 172 days and when the production started in February 2004 temperature increased to 41 °C.

¹ Shell Brazil Exploration and Production

During the time that the header was in operation, from 23 February 2004 to 26 February 2008, the temperature increased gradually up to 67 °C.

The pH value of the fluid that passed Header #2 has not permanently been measured. The provided data were collected during a small period of time (77 days) in which the pH occurred to fluctuate between 5.5 and 7.5 (Appendix C).

Different production chemicals were added to the oilfield production stream. Under normal conditions the pressure sheath did not have direct contact to the fluids; however some of the chemicals could affect PA11 if they are entrapped behind the carcass. Table 1 shows the composition of the main components of the chemicals injected into the Salema production stream.

Table 1 *List of chemical treatments used in the Salema field*

Product	Applications	Main Components	Concentrations, w/w % of the product
EC6080 A	Scale inhibitor	Sodium Phosphate, Tribasic Ethylene Glycol	10 – 30 1 - 5
EC9610 A	Mutual Solvent	2-Butoxyethanol	60 - 100
EC6475 A	Scale Dissolver	Diethylenetriaminepentaacetic Acid, pentapotassium Salt	10 - 30
LA3227 B	Oxygen Scavenger	Soluble Salts:Sodium Bisulphite Cobalt Sulphate	30 – 60 <1
LA3283 B	Asphaltene Inhibitor	Kerosene Heavy Aromatic Naphtha Naphthalene 1,2,4-Trimethylbenzene	10 – 30 30 – 60 5 – 10 1 - 3
303MCNR	Diesel Biocide	1-(2-Hydroethyl)-2-Imidozoline Amine Substituted Resin Naphthalene 1,2,4-Trimethylbenzene Heavy Aromatic Naphtha	25 30 – 60 1 – 5 1 – 5 10 – 30
BD05805	KCl	brine	2
EC6298 A	Corrosion Inhibitor	Tetrakis(hydroxymethyl) Phosphonium Sulphate	100

2. Determination of the materials properties of the pressure sheath

2.1 Investigated material

Two sections of unbounded flexible pipe² from the Salema field had been received at STCA for investigation. Each pipe section was about 1 m long. Pipe section Sample 2 was cut from the flexible flowline Header #2 that had been in service for about 4.5 years. The sample was taken from the manifold end where the effect of temperature and pH were expected to be greatest. Pipe section Sample 1 originates from the same project and the same manufacturer as Sample 2.

According to information received from SBRASEP this flexible sample had never been in service but was stored in the yard (as spare spool). This pipe section was investigated too as a reference.

2.2 Results of material testing

2.2.1 Visual inspection during dismantling of the flexibles

The pipe sections were dismantled to isolate the pressure sheath. Both pipe sections show different dimensions with respect to Outside Diameter (OD), inner diameter, total Wall Thickness (WT) and wall thickness of the pressure sheath. Also the lay-up of the different pipe wall components is not identical. This is shown in Figures 1 and 2. The pressure sheath of the Header # 2 section clearly shows several contaminations (Figure 3, left) when compared with the almost clean pressure sheath of the reference pipe section (Figure 3, right). The measured dimensions are listed in Table 2.

Table 2 Dimensions of the investigated pressure sheaths

Dimension, mm	Reference, UM.09.038.1	Header #2, UM.09.038.2
OD	250	270
ID	155	150
WT, flexible	50	60
WT, pressure sheath (incl. Extrusions)	6.1 (8.0)	6.6 (9.8)

2.2.2 Preparation samples for testing

Specimens were prepared from the pressure sheaths isolated from both the Header #2 section and the reference section and used for the tensile tests, for Corrected Inherent Viscosity (CIV) measurements and for the determination of the molecular weight (Mw). For the preparation of CIV and Mw specimens the wall of the pressure sheath was cut in three 2-3 mm thick zones; an internal, a core and an external zone (Figure 4). This made it possible to determine whether a gradient of the degradation over the thickness of the sheath has occurred.

² Internal Shell Global Solutions sample code section 1: UM.09.038.1, section 2: UM.09.038.2

2.2.3 Corrected Inherent Viscosity (CIV)

The CIV was measured according to the method described in Appendix D of API17TR2. The results are listed in Table 3. No significant difference in CIV could be measured between the particular thickness zones. The CIV value of Header #2 is about 20 % lower than that of the reference.

Table 3 CIV measurements of the PA11 pressure sheaths

Zone in sheath wall	Reference flexible				Header #2			
	CIV, dL/g	std. Dev.	Extractables %	std. Dev.	CIV, dL/g	std. Dev.	Extractables %	std. Dev.
Internal	1.88	0.02	12.9	0.77	1.50	0.05	10.2	0.03
core	1.90	0.02	13.1	0.49	1.48	0.02	10.2	0.25
External	1.87	0.01	13.1	0.32	1.60	0.02	9.7	0.15
average	1.88	0.02	13.2	0.1	1.53	0.07	10.0	0.3

2.2.4 Molecular weight

The molecular weight of PA11 was measured by high temperature Gel Permeation Chromatography (GPC). The used solvent was HexaFluoro-Iso-Propanol (HFIP). The results are expressed as PMMA equivalents and listed in Table 4. The average Mw of Header #2 decreases with about 60 % when compared with the reference sheath. The curves of the Mw show in Figure 5 a clear shift of the Gaussian distribution bell to lower values for the pressure sheath of Header #2.

Table 4 Molecular weight of the PA11 pressure sheaths

Zone in sheath wall	Reference flexible			Header #2		
	Mw, g/mol	Mn, g/mol	Mw/Mn	Mw, g/mol	Mn, g/mol	Mw/Mn
internal	74,450	19,250	3.9	28,750	10,550	2.8
core	78,900	18,100	4.3	28,750	10,250	2.8
external	73,100	16,950	4.3	33,500	11,900	2.8
average	75,483	18,100	4.2	30,333	10,900	2.8

Mw = Weight average molecular weight

Mn = Number average molecular weight

Mw/Mn = Polydispersity index (PDI)

2.2.5 Tensile properties

Tensile tests were carried out according to ASTM D638 with a cross head speed of 10 mm/min. The results of the tensile tests are listed in Tables 5 and 6 and the stress/strain curves are shown in Figures 6 and 7. The strain at failure of the exposed field specimen is about 73 % (362.5/494.5) of that of the virgin material of the reference material.

Table 5 Tensile properties of PA11 sheath from reference flexible

Reference: Tensile properties				
Specimen	Yield strain	Yields stress	strain at break	Stress at break
no.	%	N/mm2	%	N/mm2
1	80.9	29.7	584.6	48.8
2	86.1	29.8	567.1	48
3	90.1	30.4	562.3	47.3
4	84.6	30	402.8	39,3
5	82.4	30.6	493.3	44.5
6	80.9	30.3	512.8	45.4
7	77.5	30.7	374.4	39.5
8	79.1	30.3	474.4	43.8
9	82.6	30.8	490.1	44.5
10	81.2	30.4	483.4	44.4
average	82.5	30.3	494.5	45.1
std.dev.	3.6	0.4	68.1	2.8

Table 6 Tensile properties of PA11 sheath from Header #2

Header #2: Tensile properties				
Specimen	Yield strain	Yields stress	strain at break	Stress at break
no.	%	N/mm2	%	N/mm2
1	79.1	37	294.2	36.2
2	75.4	36.9	320.3	34.8
3	78.3	36.2	326.7	37.8
4	77.4	37.6	310.1	37.7
5	76.7	36.8	400.2	39
6	79.1	36.9	339.7	38.9
7	74.1	37.3	329.5	37.4
8	77.2	37.7	456.8	42.7
9	82.6	37.1	387.2	37.7
10	80.4	37.1	459.9	42.8
average	78.0	37.0	362.5	38.5
std.dev	2.5	0.4	60.1	2.5

3. Remaining lifetime assessment based on historical operating data

3.1 Input data for the lifetime assessment

For the calculation of the consumed lifetime, the historical temperature profile for Header #2 had to be established. The temperature data collected from Header #2 show a fluctuation over the time with an increasing tendency (Figure 8). The average temperature over the entire installation period was calculated to be 51.6 °C.

As the affect of temperature on the degradation mechanism is significant, using the average temperature for the lifetime prediction would be conservative. Therefore, it was decided to use Miner's law approach, as described in Appendix H of API 17TR2, The temperature transient was divided into eight temperature regions of 6 °C wide each. For each region the exposure time was established and used to calculate the contribution of each temperature region.

The results are listed in Table 7 and the different regions are shown in Figure 9.

Unfortunately, the pH of the transported production fluids was not monitored over the entire service period. The data provided only covered the period from 4 September 2006 to 20 November 2006. During this period the pH varied between 5.5 and 7.5 with an average of 6.5. The possible fluctuation of the pH value during the total operation period is unknown and it cannot be excluded that the pH had been lower than 5.5, which may have had an accelerating effect on the PA11 degradation rate.

Table 7 Service time of Header #2 against sorted temperature regions

Temperature Range, °C	Time at temperature, days	Time at temperature, %	Temperature region, no.	Average temperature, °C
19-24	139	8.4	1	22.4
25-30	100	6.0	2	25.6
31-36	111	6.7	3	33.8
37-42	12	0.7	4	39.8
43-48	240	14.5	5	45.8
49-54	407	24.6	6	52.4
55-60	118	7.1	7	59.0
61-67	628	37.9	8	62.9
Average temperature, °C				53.6
Total, days	1655			
Total, years	4.5			

3.2 Determination of the consumed lifetime

To check which constant operation temperature would have been required to cause a degradation resulting in a CIV of 1.53 dL/g after 4.5 years, a procedure was followed that is described in detail in Ref.[2]. The results of this procedure are presented in Figure 10, in which the time to reach a CIV of 1.53 dL/g is plotted as function of time. This procedure was repeated for a range of pH values. At an assumed historical constant pH value of 6.5, the required temperature to reach a CIV of 1.53 dL/g after 4.5 years was found to be 68.3 °C (red dot).

The consumed lifetime for Header #2 was calculated, based on the Miner's law approach as described in Appendix H of API 17TR2 and using a critical CIV of 1.1 dL/g (for a detailed description of the procedure see [2]). This was repeated for a number of pH values. The results of these calculations are given in Table 8.

Table 8 Consumed lifetime of the sheath of Header #2 (Critical CIV of 1.1 dL/g)

pH	Time, year	Temperature, °C	Consumed lifetime (of 1.1dL/g criteria), %
7.5	4.5	70.8	5.03
6.5	4.5	68.3	6.77
5.5	4.5	65.9	9.04
5.0	4.5	64.7	10.46

3.3 Prediction of the remaining lifetime

Based on the consumed lifetime data provided in Table 8, the predicted remaining lifetime for a given future pH value and future temperature were analysed and presented in Figures 11, 12 and 13 for respectively, a future pH of 7.5, 6.5 and 5.5. Figure 14 summarizes the data of Figures 11, 12 and 13, assuming a historical constant pH of 6.5.

As an example:

Based on the historical temperature profile and a pH of 6.5, from Table 8 it follows that the consumed lifetime is 6.8 years. Selecting a future temperature of 70 °C and a pH of 6.5, the remaining lifetime after the current 4.5 years of operation will be about 13.4 years. The total theoretical lifetime based on the historical and future conditions would become 4.5 years + 13.4 = 17.9

If the production fluid has a pH of 5.0, 5.5 or 7.5 the remaining lifetime than will become 9, 10.6 and 18 years as shown in figure 15.

Figure 16 shows that the relation between remaining lifetime and pH is linear. This easily allows the calculation of the remaining lifetime for an arbitrary pH value.

4. Discussions

4.1 Material testing results

For the assessment it is assumed that the pressure sheaths of the reference flexible and the Header #2 flexible are made of identical PA11 materials. The sheath material from the reference material was therefore used as reference material which represents the virgin condition.

The results of the destructive investigations show that the pressure sheath of Header #2 suffered from ageing as a result of field exposure. A decrease of the average molecular weight and the CIV are a measure for degradation.

The average molecular weight of the sheath clearly decreased with 60 %, from about 75500 g/mol to 30300 g/mol, and the CIV with 20 %, from 1.88 dL/mg to 1.53 dL/mg. The Poly Dispersity Index (PDI) indicates that the Header # 2 sheath has more uniform chain lengths, which most probably is an effect of chain scissoring due to degradation. The average tensile strength decreased after operation with 14 % and the strain at break with 27 %, or to 73 % of that of the virgin material. The rupture occurred after an elongation of 363 % (average).

With respect to the ageing status of the investigated sheath of Header #2 it could be concluded that:

- The measured CIV of the pressure sheath of Header #2 (1.53 dL/mg) is still well above the API 17TR2 acceptance criterion of 1.1 dL/g for flexibles used under static conditions.
- The strain at break decreased to 73 % of that of the virgin material, but is well above the minimum acceptance level of 50 % as recommended by API RP17B.
- According to API 17TR2 corresponds the molecular weight of 30500 g/mol of Header #2 sheath with a CIV of 1.20 dL/g. This relationships, however, is not rigid. Commercially available PA11 materials show comparable Mw values in connection with higher CIV values (explained in paragraph below).

API 17TR2 describes the relationship between the molecular weight and the viscosity in case the required constants are known. As these constants were not available, a direct comparison of the measured Mw and the measured CIV values is not allowed.

Woodside Australian Energy published [3] the Mw of different exposed PA-11 samples, measured by size exclusion chromatography (SEC)³, as function of the CIV (Figure 17). The measured Mw of the Header #2 sheath (see red dot in Figure 17) seems to match with the lower boundary of the Mw – CIV relation.

4.2 Effect of the chemical treatments

The effect of most of the added chemicals is unknown. In general terms, it is known that benzene and aromatic solvents (present in asphaltene inhibitor and diesel biocide) could cause swelling above 40 °C. Methanol, often used as hydrate treatment chemical and known as strong ageing agent for PA11, had not been injected in the fluid (according info from SBRASEP).

4.3 Estimated consumed lifetime

The calculated average temperature required to reach a CIV of 1.53 dL/g after an exposure of 4.5 year at a pH level of 6.5 is 68.3 °C. This temperature is about 15 °C higher than the average temperature calculated from the measured data of Header #2, but very similar to the highest measured temperature (67 °C) that occurred during operation of the header. As a conservative approach, 68.3 °C was used as input as the historical temperature for the calculation of the remaining lifetime. The estimated consumed lifetime refers to a CIV of 1.8 dL/g of the virgin PA11. The reference PA11, however, was found to have a CIV of 1.88 dL/g. The estimated consumed lifetime should be seen as conservative.

³

GPC and SEC are different names for identical methods.

4.4 Predicted remaining lifetime

The remaining lifetime of the pressure sheath depends very strong on the future operation conditions; especially the temperature and the acidity of the production stream play a major role in PA11 ageing. The used model is very sensitive to slight variations in both pH and temperature, an increase of the temperature or a lowering of the pH will change the remaining lifetime significantly.

An accurate estimation and on-line monitoring of the operation temperature and the pH levels of the production stream are therefore crucial for a reliable prediction of the remaining lifetime.

Assuming a future constant temperature of 70 °C the model predicts a remaining lifetime of 13.4 years. It should be noted that the provided data on the historical and future pH values are best estimates, but are uncertain.

The application of PA11 coupons into the production stream is recommended to enable future measurements of the CIV to have a direct comparison with the critical acceptance CIV level, and to provide additional datapoints to construct the degradation curve and check this data with. Assuming a constant future temperature of 70 °C and a pH of 6.5, the estimated remaining lifetime will be 13.4 years.

It should be noted that the temperature has a significant effect on the prediction of the remaining lifetime. From Figure 8 it can be seen that the assumed future temperature of 70 °C is conservative, and therefore the predicted lifetime of 13.4 years is also considered to be conservative.

If the future temperature will exceed 70 °C, the remaining lifetime needs to be adjusted to this new temperature.

5. Conclusions

- The CIV and the average Mw of the PA11 pressure sheath of an un-used reference flexible were measured to be 1.88 dL/g and 75500 g/mol respectively.
- The CIV of the pressure sheath of Header #2 showed after an operation period of 4.5 year a decrease of 20 % (to 1.53 dL/g).
- The measured CIV is still far above the API 17TR2 initial acceptance criterion of 1.1 dL/g for flexibles used under static conditions.
- The measured Mw of the Header #2 pressure sheath decreased after service with 60 %.
- The strain at break decreased to 73 % of that of the virgin material, but is well above the minimum acceptance level of 50 % as recommended by API RP17B.
- The estimated temperature to achieve a CIV value of 1.53 dL/g after 4.5 years and at a pH of 6.5 was calculated to be 68.3 °C.
- Assuming a constant future temperature of 70 °C and a pH of 6.5, the predicted remaining lifetime will be 13.4 years.
- Based on the temperature profile provided, 70 °C is considered to be conservative.
- The future pH level shall be estimated as accurate as possible, as the pH will have a significant effect on the predicted remaining lifetime.
- The monitored temperature of the header shows an increasing tendency. It is, therefore, expected that the temperature will increase in future and this will cause a significant decrease of the predicted remaining lifetime.

6. Recommendations

- It is strongly recommended to install PA11 coupons into the production stream (via corrosion cells) and to constantly monitor both the temperature and the pH level close to these coupons.
- The coupons could be used to repeat CIV measurements and recalculation of the remaining lifetime.

7. References

1. API 17TR2: The ageing of PA11 in flexible pipes.
2. De Mul, L.M.: Remaining lifetime assessment Pa-11 sheath ex. Brent Bravo; GS.09.54435.
3. Morison, M.: Wanaea/Cossack flexible risers, Rilsan degradation; C SGVG0127.ppt; Presentation 17 July 2002.

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**Figure 1**

Cross section through Header #2 flexible; remark that the build-up of the components is different to the build-up of the reference as shown in Figure 2



Figure 2 *Cross section through reference flexible*

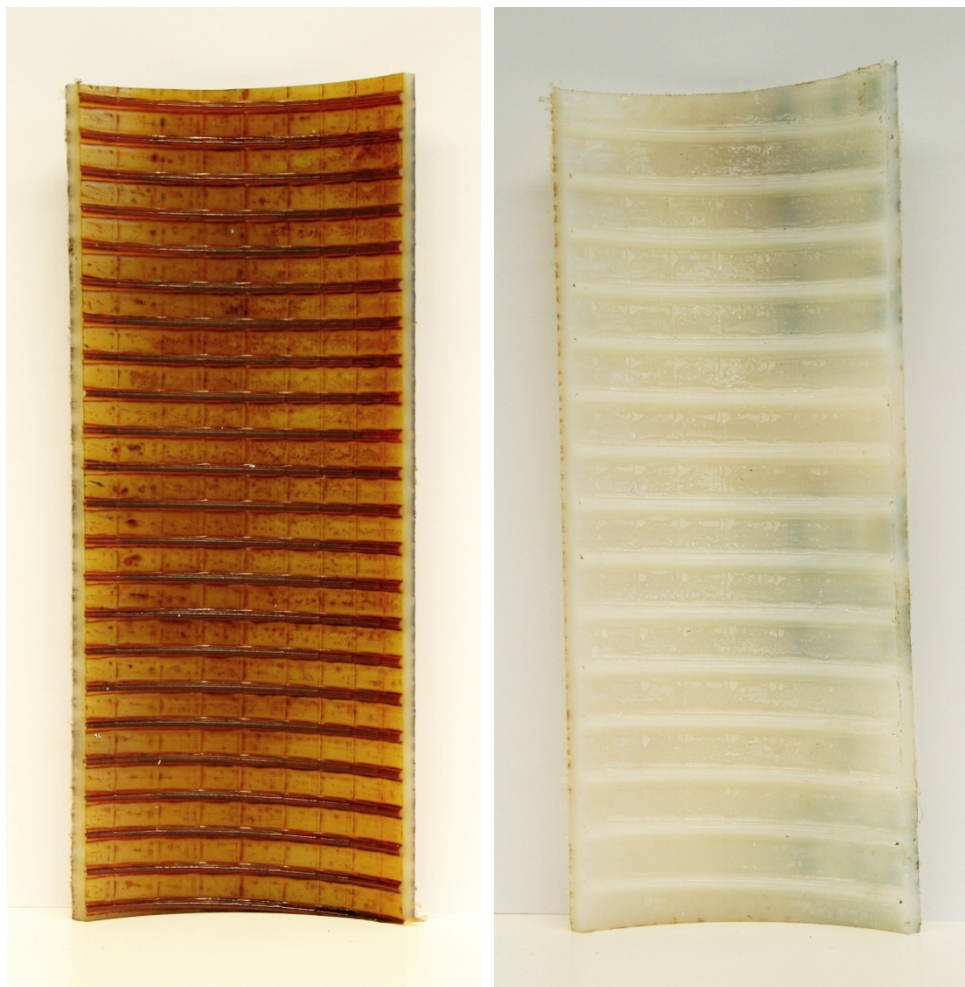


Figure 3

The internal surfaces of the investigated pressure sheaths; left image shows the Header #2 sheath with contamination, right image shows the clean reference sheath

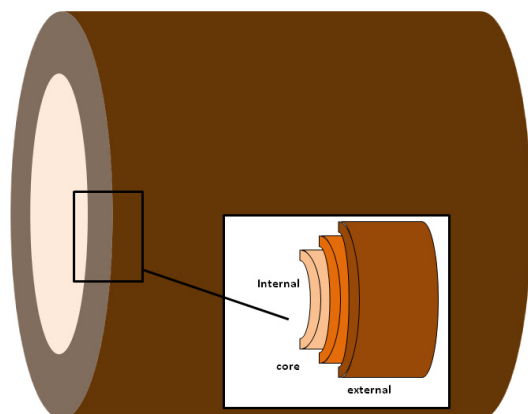
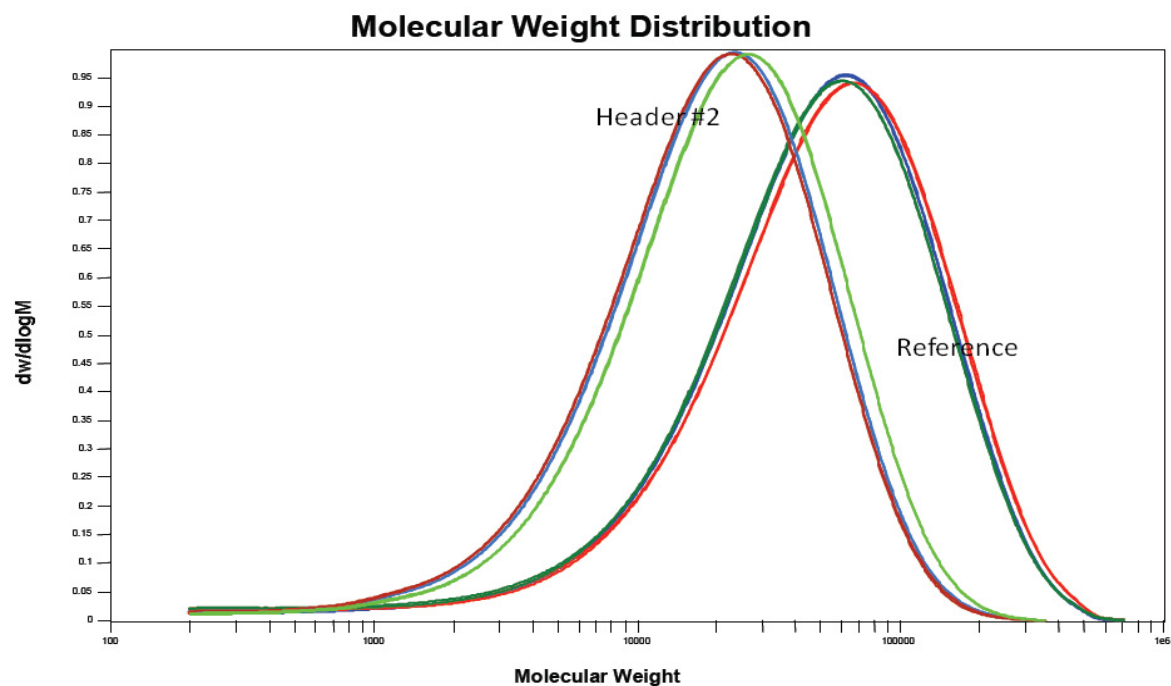
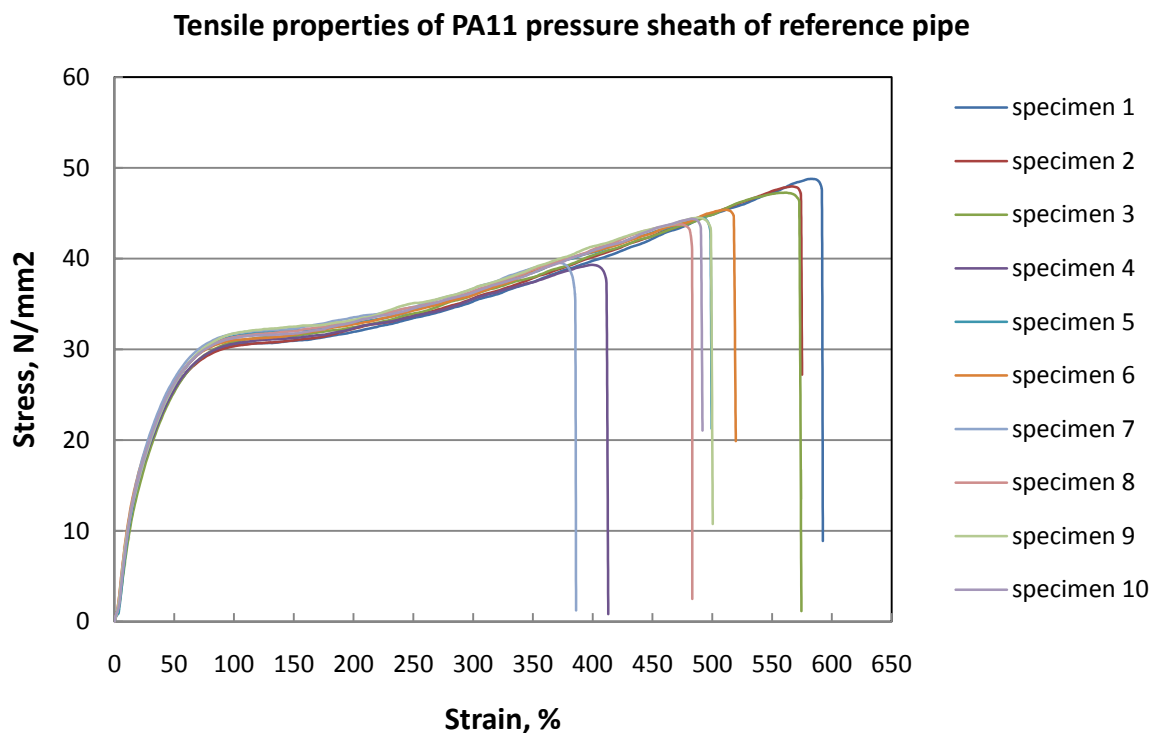


Figure 4

Drawing shows sampling of specimens for CIV and molecular weight measurements; specimens cut from internal pipe surface, the core and from the external pipe surface

**Figure 5**

Molecular weight distribution (log. Scale) of the pressure sheath; difference between internal, core and external pipe wall is only small; significant decrease of Mw after service

**Figure 6**

Stress/strain curves of reference pressure sheath

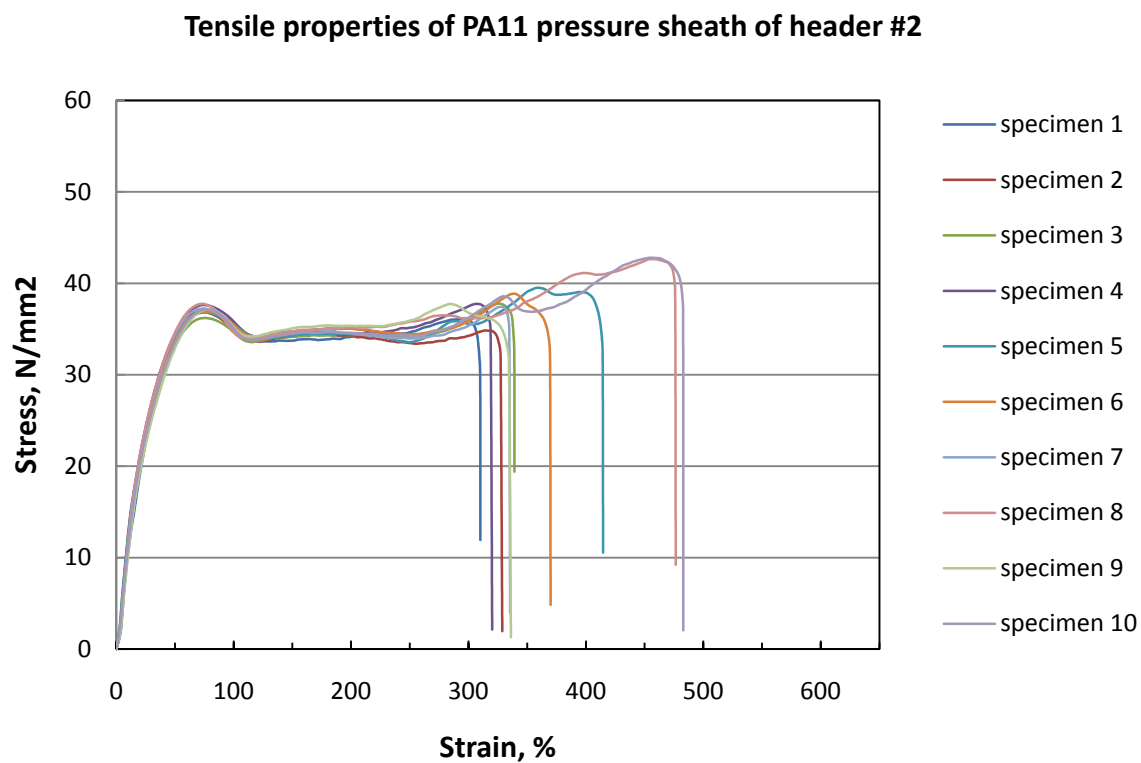


Figure 7 Stress/strain curves of Header #2 pressure sheath

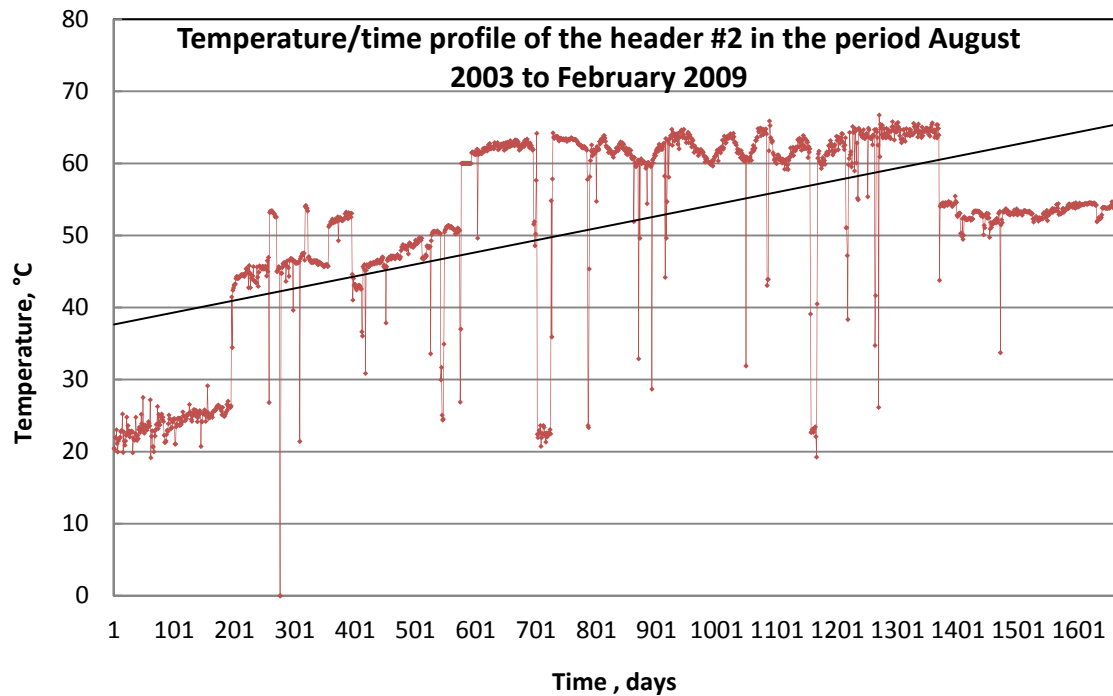


Figure 8 Historical temperature profile of Header #2

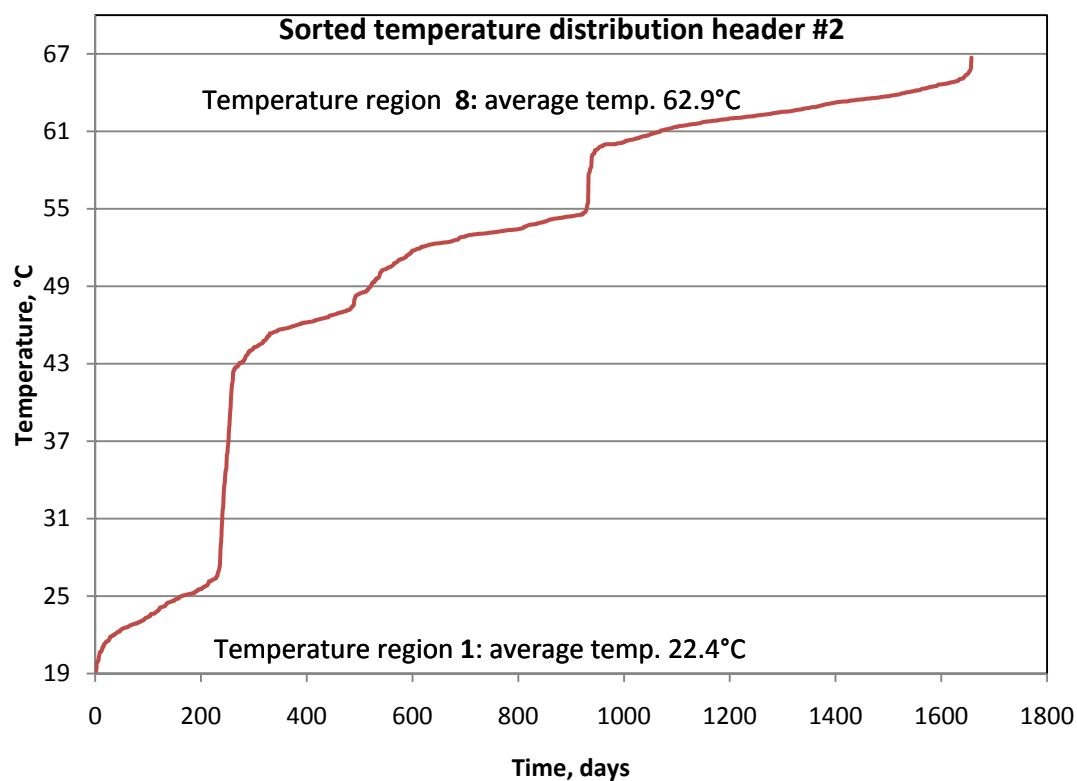


Figure 9 Sorted temperature distribution; divided into eight regions

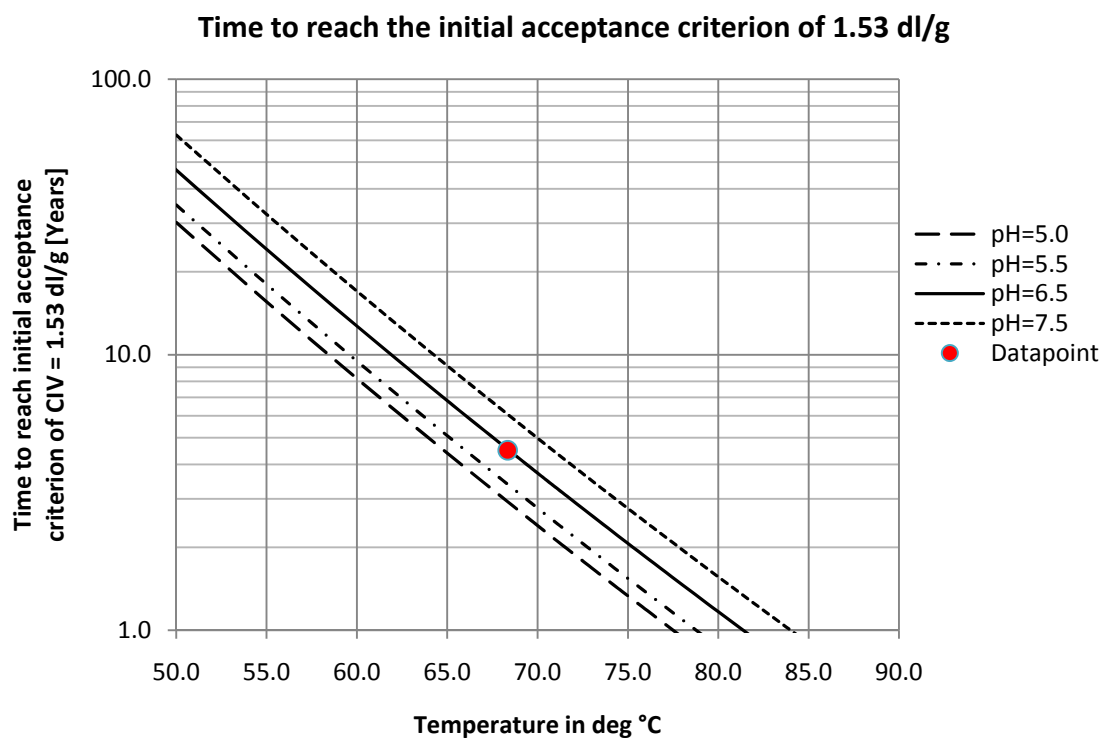
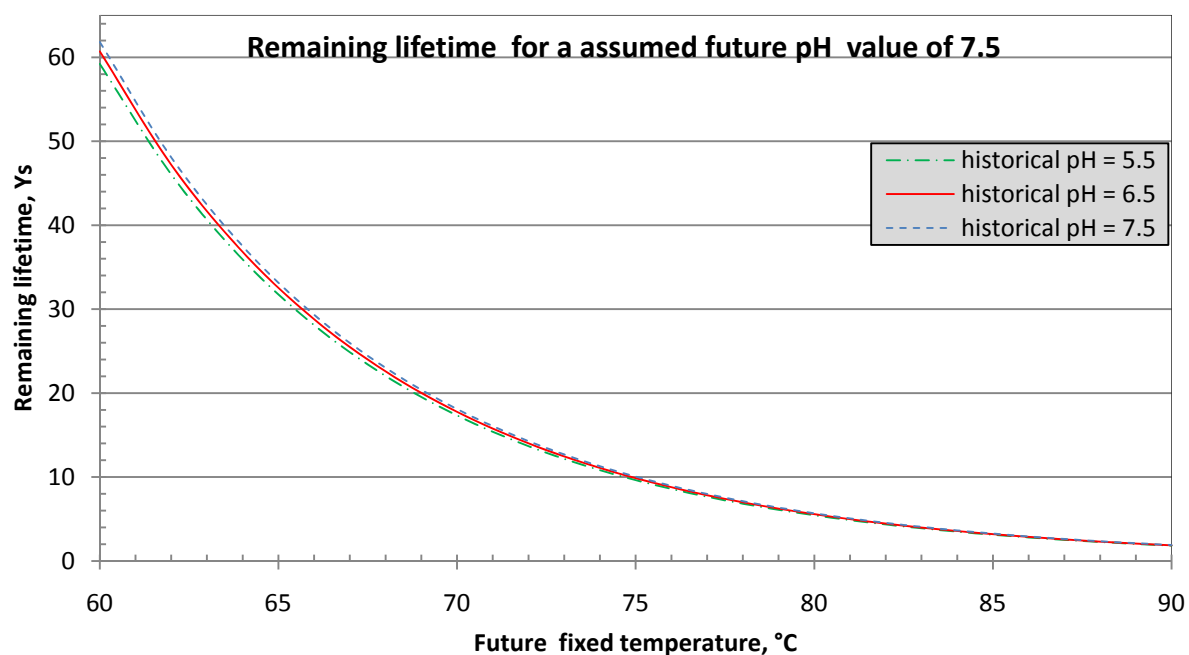
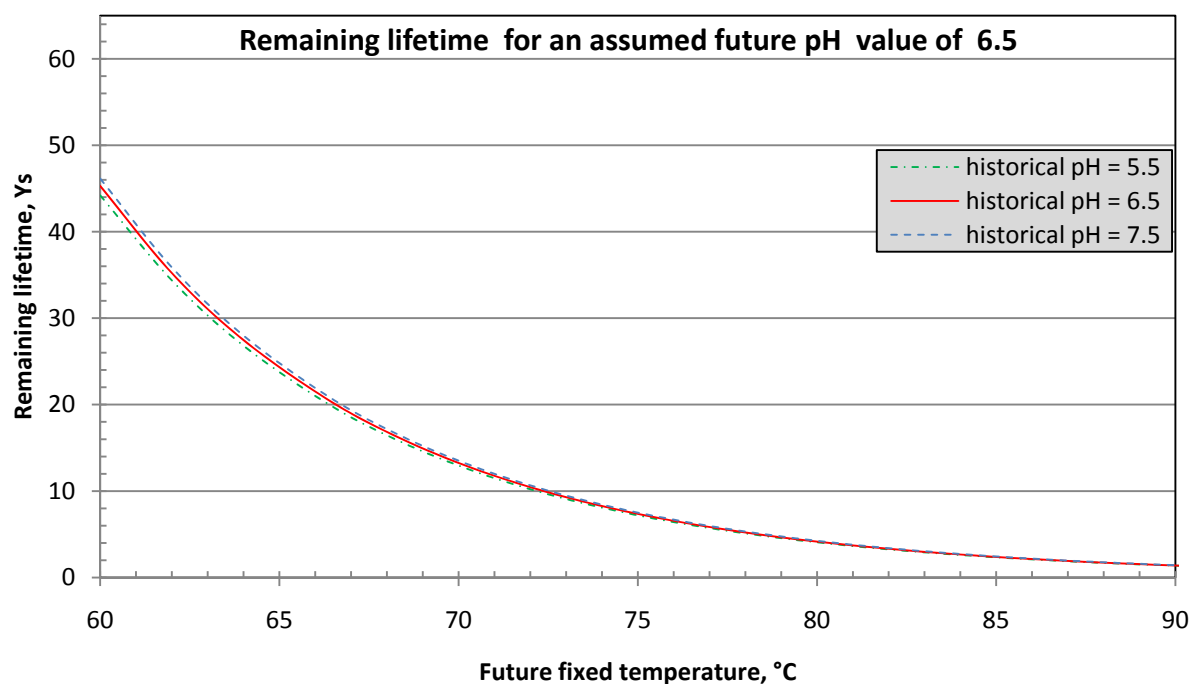


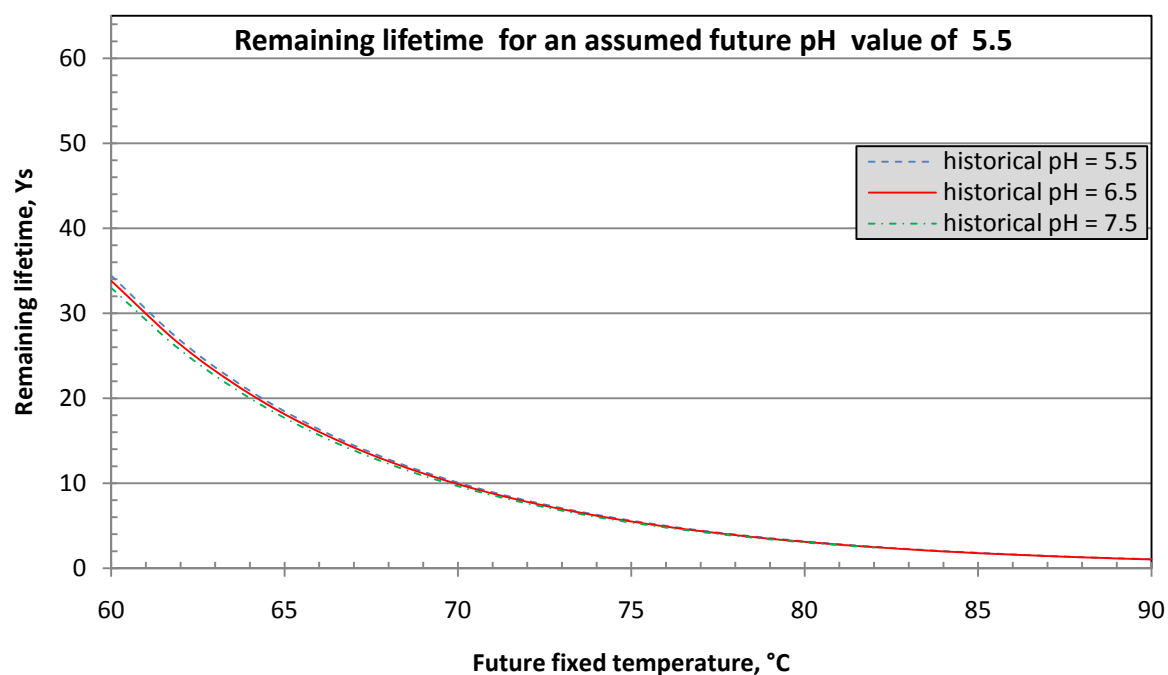
Figure 10
Time – temperature plot of the calculated time to reach the CIV 1.53 dL/g criterion based on historical temperature data

**Figure 11**

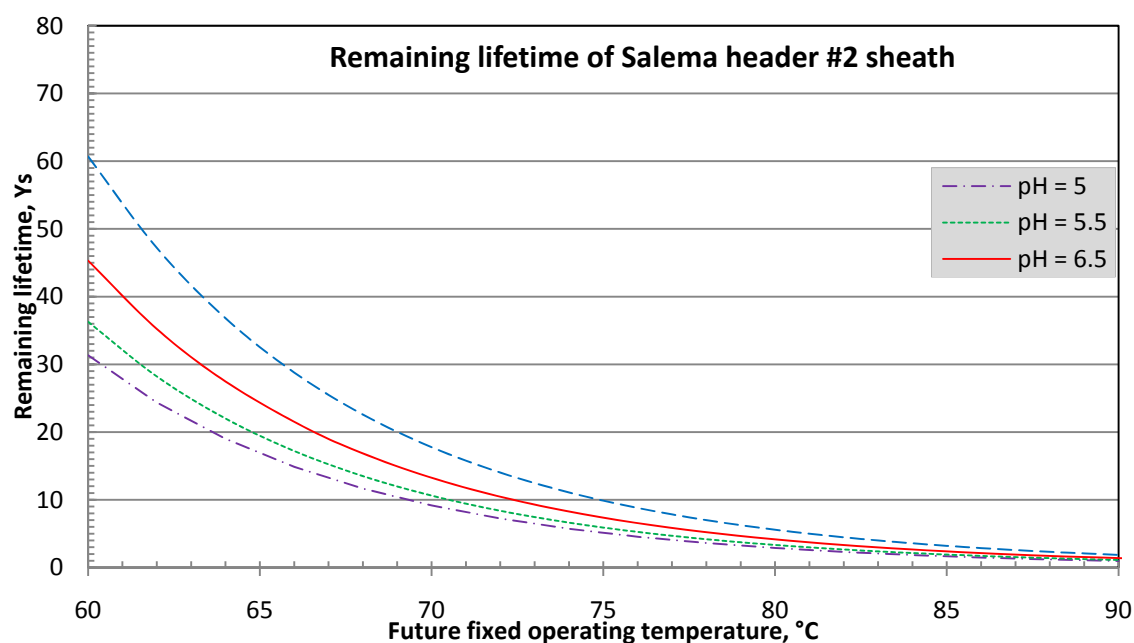
Remaining lifetime assessment for pH 7.5 according API 17TR2 Annex H; calculation based on historical temperature data profile and different assumed pH values

**Figure 12**

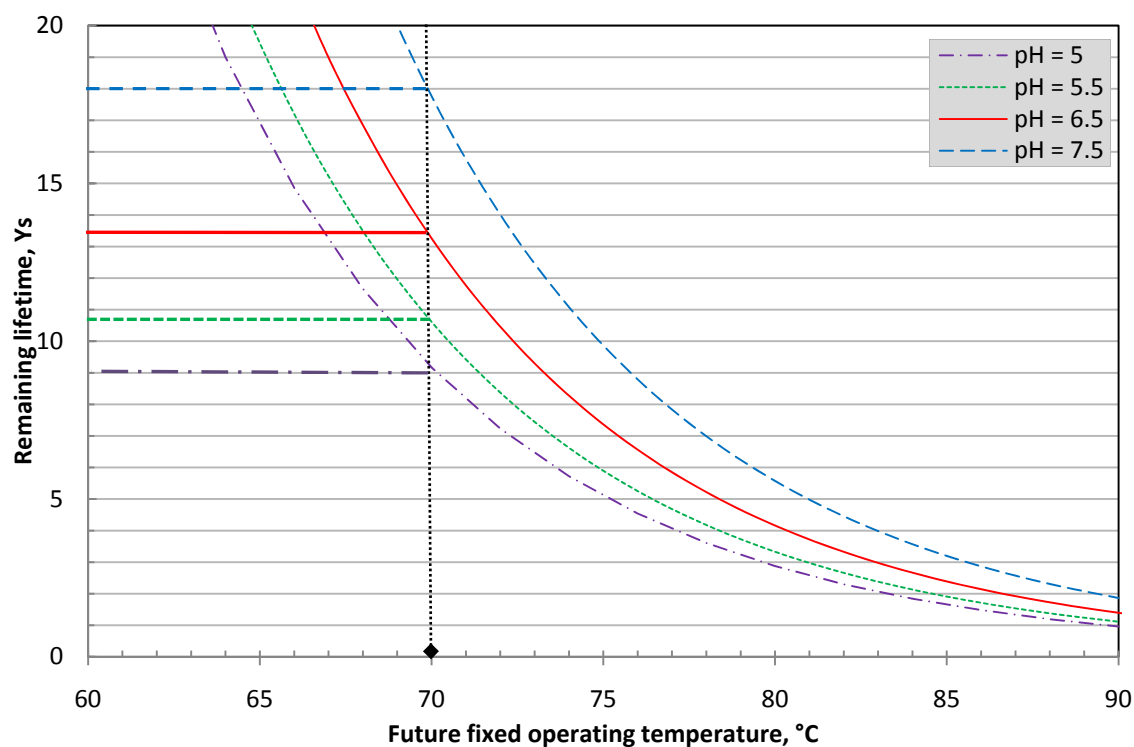
Remaining lifetime assessment for pH 6.5 according API 17TR2 Annex H; calculation based on historical temperature data profile and different assumed pH values

**Figure 13**

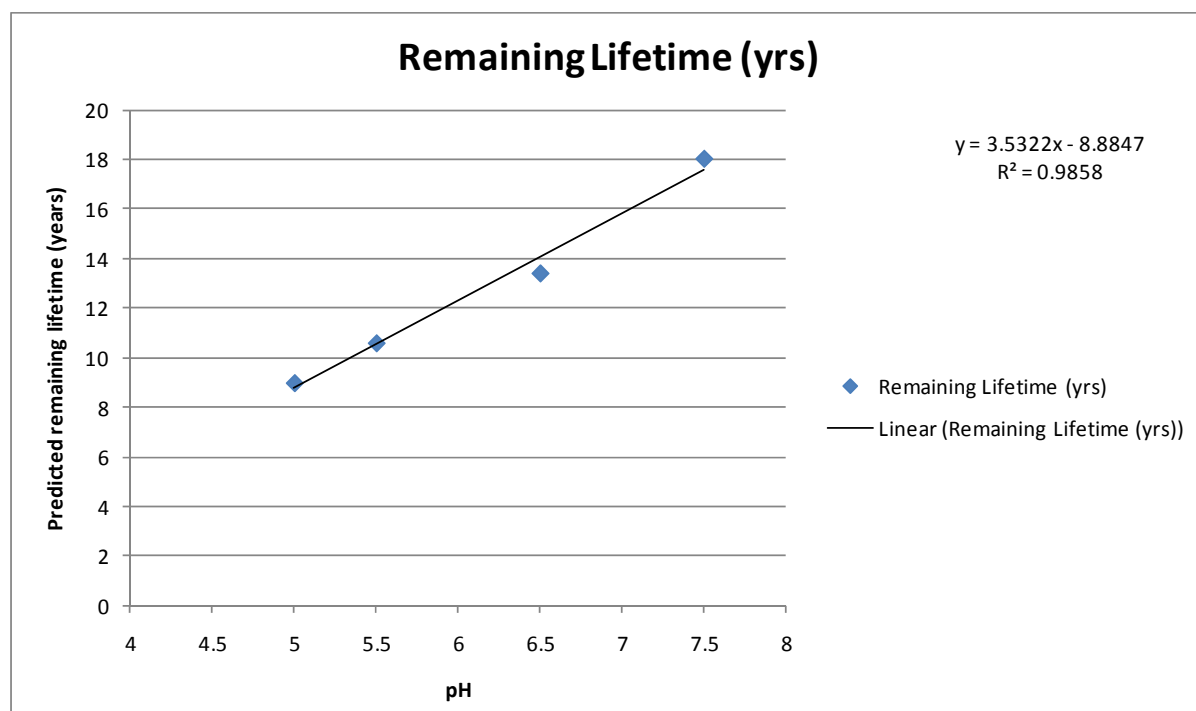
Remaining lifetime assessment for pH 5.5 according API 17TR2 Annex H; calculation based on historical temperature data profile and different assumed pH values

**Figure 14**

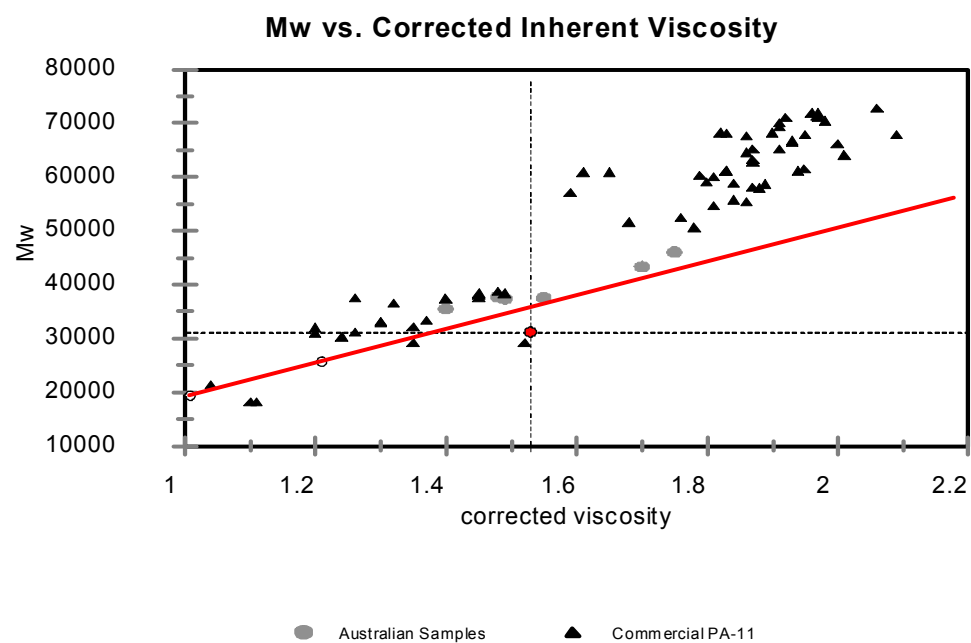
Remaining lifetime assessment of the sheath as function of an assumed (fixed) future operating temperature (based on historical temperature profile and assumed historical constant pH of 6.5)

**Figure 15**

Remaining lifetime Salema Header #2 pressure sheath at future operation temperature of 70 °C

**Figure 16**

Linear relationship between predicted remaining lifetime and pH value of the production stream



● Salema Header #2

Figure 17

Molecular weight vs. corrected inherent viscosity of different PA11 pressure sheaths

Appendix A. End-of-service life recommendations from EPW Subsea Surveillance Team (SST)

Salema flowline end of service life

Subsea Surveillance Team
recommendation

Team: - Paul Ritter (EPW)
- Jemei Chang (SGS)
- Kees Lagers (EPW)

March 2008, New Orleans



Background

The EPW Subsea Surveillance Team (SST) was asked to assist in establishing a best estimate for the end of service life of the Salema flexible flowlines based on the aging of PA-11 (nylon sealing layer)

- Field data was gathered in cooperation with SBEP
- SGS calculated an end of service life for the Salema flowlines and risers based on API 17TR2
- A sensitivity analysis was carried out
 - Higher and lower temperatures were considered, to cover i) inaccuracy of the gauges and ii) possible future changes in operating conditions resulting in higher or lower temperatures (e.g. increased water cut, gas lift, ...)
 - Higher and lower pH was considered – there is still some uncertainty with regards to the pH history of the flowline
 - Alternative end-of-life criteria were applied to the PA-11
- A recommended end-of-service-life has been drafted

Recommendation

SST considers the risk associated with operating Flowline 2 until Q1 2009 acceptable

- SST recommends to operate **Flowline 1** no longer than end **Q2 2009**
- SST recommends to operate **Flowline 2** no longer than end **Q1 2009**

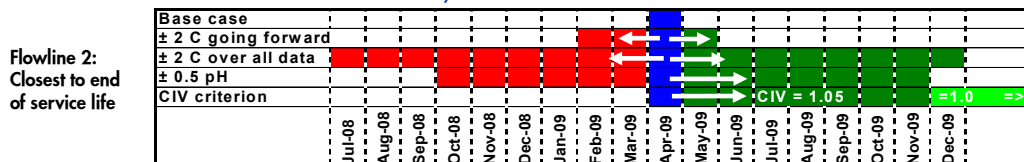
=> Keep monitoring the flowlines and the water pH on a 2-monthly basis to catch significant changes to assumptions or results in time

Methodology, key variables

- Algorithm: API-17TR2 provides an algorithm that calculates the remaining field life of the PA-11 based on Corrected Inherent Viscosity (CIV) the Pa-11 may reach:
- Algorithm
 - Time (yrs) = $1,314 \cdot \text{EXP}(14033/T(K) - 40,432 + 0,2925 \cdot \text{pH})$
- Key constant: What **CIV** should be used?
 - API-17TR2 quotes CIV=1.1 as initial acceptance criterion (results in **1.314**)
 - API-17TR2 quotes CIV=1.05 as failure criterion (results in **1.513**)
 - Industry has not experienced a failure above CIV=0.90
- Key variables:
 - **Temperature** (monthly averages of field data used); main concern is the flowline inlet temperature
 - **pH** (an average pH of 5.9 was used)

Justification for recommendation

- CIV
 - Given that in the industry no failure has been recorded above a CIV of 0.9, the failure criterion per API of CIV=1.05 is considered reasonable to use as limit (instead of 1.1)
 - Temperature going forward:
 - Until now field data has always been 0-2 C lower than predicted data
 - Gas lift results in ~2 C lower temps (based on a field test by SBEP)
 - Temperature over all data
 - As opposed to earlier work (T derived from production rates), now full history of production temperatures is used.
 - Temperature for historic field data: an average has been used of 2 gauges, inaccuracy of historic data expected to be less than 2 F
 - pH
 - analysis (by Dario Frigo) indicates a pH range of 6.1-6.6 is more realistic
- => Conclusion is that the overall direction of uncertainty is towards longer service life, not shorter. **Q1 2009** is therefore considered sufficiently conservative.



Concerns, additional cases

- Main concerns are:
 - Accuracy of temperature gauges; if temperatures have been higher the impact could be significant. Considered unlikely as an average temperature was used from 2 gauges.
 - How representative is the water sample for the pH history of the line? (-COMMENT BILL-)
 - Delays beyond Q1 09 are not acceptable
 - Current EPP replacement schedule shows Salema shut in for replacement in January 09
 - What is our blind spot...?
- Redeeming factors not considered
 - We have used the "wet" algorithm rather than the much less aggressive dry algorithm. API definition for dry is <80% saturation of water in oil. Still, periods of 0% wc production occurred at SA-E, and most production was <1% wc.
 - API generally is conservative
 - No failures observed above CIV=0.9
- Validation of approach
 - Bill Nisbet – TA Subsea Integrity
 - Blake Hebert – Subsea Surveillance Team manager
 - Charles Smith – SME flexibles

Appendix B. Pressure and temperature data of flexible Header #2

Pressure and temperature data of flexible Header #2

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
12-8-2003		36.65		1852.59		20.48		20.96
13-8-2003		38.54		1495.91		20.31		20.96
14-8-2003		39.95		1434.11		21.95		22.15
15-8-2003		39.48		1705.86		21.91		22.26
16-8-2003		41.37		2144.16		23.03		23.29
17-8-2003		39.48		1531.30		21.11		21.92
18-8-2003		37.59		1210.95		19.96		20.42
19-8-2003		39.48		1369.47		21.49		21.59
20-8-2003		39.01		1571.87		21.80		21.91
21-8-2003		38.54		1170.85		21.85		22.42
22-8-2003		39.01		1200.57		22.03		22.56
23-8-2003		39.01		1523.75		22.77		23.23
24-8-2003		39.01		1582.72		22.92		23.42
25-8-2003		40.42		1686.99		22.90		23.56
26-8-2003		41.84		2199.36		25.22		24.25
27-8-2003		37.12		1260.02		19.89		20.00
28-8-2003		41.37		2135.20		22.74		22.87
29-8-2003		39.95		1488.84		21.47		21.81
30-8-2003		37.59		2159.73		20.89		20.94
31-8-2003		38.07		2185.21		21.48		21.54
1-9-2003		38.54		2288.53		22.25		22.99
2-9-2003		40.42		2381.47		24.80		24.10
3-9-2003		39.01		2308.82		22.48		23.01
4-9-2003		38.54		1948.37		23.61		22.68
5-9-2003		38.54		1617.17		22.85		22.91
6-9-2003		38.54		1617.17		22.85		22.91
7-9-2003		38.54		1502.05		22.05		22.45
8-9-2003		38.54		1698.31		22.57		23.10
9-9-2003		38.54		1666.23		22.81		23.33
10-9-2003		39.95		1627.54		22.85		23.52
11-9-2003		39.48		1592.16		22.78		23.61
12-9-2003		36.65		1301.53		19.85		20.58
13-9-2003		38.54		2087.07		21.90		21.76
14-9-2003		38.54		2071.98		21.68		22.36
15-9-2003		38.54		1971.48		21.58		21.57
16-9-2003		38.54		2130.95		22.53		22.60
17-9-2003		40.42		2447.53		24.78		24.60
18-9-2003		38.54		2138.03		22.23		22.34
19-9-2003		39.01		1941.29		21.56		21.86
20-9-2003		38.54		1814.85		22.21		21.92
21-9-2003		38.54		1720.96		21.80		22.90
22-9-2003		38.07		1524.69		23.09		23.56
23-9-2003		38.54		1664.82		23.41		23.64
24-9-2003		38.54		1749.27		22.66		23.22
25-9-2003		35.24		5659.51		23.01		23.80

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
26-9-2003		37.59		0.00		25.18		25.33
27-9-2003		35.71		0.00		23.88		23.49
28-9-2003		35.71		40.42		23.30		23.85
29-9-2003		36.65		212.63		27.52		25.67
30-9-2003		35.24		215.93		22.91		23.33
1-10-2003		35.71		298.97		22.56		22.77
2-10-2003		37.12		457.49		23.69		23.27
3-10-2003		35.24		813.70		23.63		23.18
4-10-2003		34.76		629.70		23.43		23.41
5-10-2003		34.76		597.62		22.97		22.97
6-10-2003		35.24		717.92		23.26		23.50
7-10-2003		35.71		808.98		23.63		24.06
8-10-2003		35.71		874.09		24.15		24.60
9-10-2003		36.18		802.85		23.96		24.41
10-10-2003		35.71		540.53		23.58		24.18
11-10-2003		36.18		1305.78		27.19		26.27
12-10-2003		35.24		472.59		19.16		19.34
13-10-2003		35.71		2028.57		22.13		22.08
14-10-2003		35.71		2248.43		22.90		22.60
15-10-2003		35.71		1229.35		20.67		21.06
16-10-2003		35.24		1231.24		20.66		21.02
17-10-2003		35.24		922.21		19.99		20.48
18-10-2003		36.18		1784.18		22.85		21.99
19-10-2003		34.76		1705.39		22.17		22.17
20-10-2003		35.24		2465.93		23.06		23.58
21-10-2003		35.71		2599.44		23.75		24.43
22-10-2003		35.71		2816.00		23.81		24.20
23-10-2003		35.71		3072.66		26.26		26.66
24-10-2003		35.24		1721.90		23.19		23.24
25-10-2003		36.65		2994.34		25.17		24.65
26-10-2003		35.71		2699.94		24.11		24.38
27-10-2003		35.71		2694.27		23.71		24.29
28-10-2003		35.71		2845.25		25.07		24.48
29-10-2003		36.65		2827.32		24.76		24.57
30-10-2003		36.65		2842.42		25.22		24.48
31-10-2003		34.76		2422.52		24.45		24.01
1-11-2003		34.76		0.00		24.76		24.29
2-11-2003		35.71		0.00		24.18		24.69
3-11-2003		34.76		0.00		22.26		22.72
4-11-2003		32.88		0.00		21.28		21.84
5-11-2003		34.76		0.00		21.32		21.74
6-11-2003		34.76		0.00		21.49		21.74
7-11-2003		34.76		0.00		22.36		22.61
8-11-2003		34.29		0.00		22.98		23.26
9-11-2003		34.29		0.00		22.78		23.23
10-11-2003		35.24		761.80		23.88		24.20
11-11-2003		35.71		799.07		25.07		25.07
12-11-2003		34.76		766.52		24.54		24.77
13-11-2003		36.65		853.33		24.53		24.79
14-11-2003		35.24		856.63		23.17		23.30

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
15-11-2003		34.29		865.12		23.32		23.27
16-11-2003		31.93		988.26		23.33		23.50
17-11-2003		34.29		928.82		24.09		24.23
18-11-2003		34.29		868.43		24.50		24.80
19-11-2003		34.29		856.16		24.33		24.64
20-11-2003		34.29		835.87		24.60		24.93
21-11-2003		8833.75		184.79		21.05		24.19
22-11-2003		8833.75		184.79		21.05		24.19
23-11-2003		11272.46		0.00		23.44		23.73
24-11-2003		627.81		658.00		23.87		24.62
25-11-2003		709.90		650.93		24.58		24.89
26-11-2003		129.59		641.49		24.50		24.88
27-11-2003		0.00		635.83		24.64		25.02
28-11-2003		32.88		630.17		24.60		24.95
29-11-2003		15.42		622.15		23.62		23.58
30-11-2003		8.81		617.90		24.64		25.05
1-12-2003		21.55		612.24		23.77		24.70
2-12-2003		23.91		600.92		24.19		24.34
3-12-2003		6.46		592.43		24.11		24.55
4-12-2003		229.14		593.84		25.52		25.98
5-12-2003		16.83		586.29		25.00		25.35
6-12-2003		26.74		578.74		24.93		25.32
7-12-2003		19.67		569.31		24.82		24.96
8-12-2003		31.93		587.71		24.29		24.73
9-12-2003		76.75		605.64		24.49		24.71
10-12-2003		12.59		603.75		24.60		25.03
11-12-2003		86.66		606.58		25.17		25.31
12-12-2003		268.30		606.58		25.10		25.94
13-12-2003		325.86		604.69		25.13		25.54
14-12-2003		586.76		601.39		25.24		25.42
15-12-2003		1130.75		598.09		26.54		26.15
16-12-2003		709.43		594.31		25.51		26.27
17-12-2003		292.36		589.12		25.20		25.74
18-12-2003		30.52		581.10		24.49		24.62
19-12-2003		959.01		575.44		24.22		24.53
20-12-2003		1415.71		575.44		24.96		25.39
21-12-2003		2104.53		574.03		25.24		25.63
22-12-2003		2235.69		572.61		25.83		26.15
23-12-2003		2118.21		568.84		25.52		26.04
24-12-2003		2498.48		567.42		25.80		26.29
25-12-2003		1664.35		560.82		24.97		25.18
26-12-2003		3043.40		561.76		25.70		26.03
27-12-2003		2759.38		557.51		25.51		25.61
28-12-2003		1567.63		550.91		24.15		24.44
29-12-2003		1956.39		551.38		24.72		25.26
30-12-2003		2250.79		551.85		25.04		25.48
31-12-2003		2511.69		549.96		25.34		25.72
1-1-2004		2802.32		551.85		25.68		26.00
2-1-2004		2572.55		548.08		25.40		25.95
3-1-2004		666.97		526.85		20.73		20.97

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
4-1-2004		4233.27		543.83		24.19		24.54
5-1-2004		4164.39		547.13		24.13		24.44
6-1-2004		5192.90		555.63		25.35		25.75
7-1-2004		5170.73		553.74		25.23		25.66
8-1-2004		5374.54		552.79		25.43		25.76
9-1-2004		5716.60		553.27		25.79		26.08
10-1-2004		4997.58		548.08		25.09		26.07
11-1-2004		4308.76		543.83		24.21		24.80
12-1-2004		5583.55		549.02		25.55		25.89
13-1-2004		5148.08		543.83		25.00		25.77
14-1-2004		7651.90		553.74		29.13		28.60
15-1-2004		5332.56		545.25		25.40		25.92
16-1-2004		4689.03		540.53		24.64		25.13
17-1-2004		5094.30		539.58		25.14		25.80
18-1-2004		767.46		301.33		25.17		25.50
19-1-2004		575.91		301.33		24.79		25.02
20-1-2004		1110.93		307.46		25.07		25.38
21-1-2004		1266.15		308.88		25.13		25.61
22-1-2004		673.10		308.88		24.77		25.21
23-1-2004		1603.96		310.76		25.56		25.84
24-1-2004		1592.16		308.88		25.54		25.81
25-1-2004		1774.27		307.46		25.73		25.96
26-1-2004		1871.94		306.05		25.75		26.03
27-1-2004		1762.95		305.10		25.69		26.00
28-1-2004		1962.99		304.63		25.92		26.26
29-1-2004		2246.07		304.63		26.16		26.42
30-1-2004		2402.71		304.63		26.33		26.55
31-1-2004		2354.11		303.21		26.35		26.63
1-2-2004		2453.66		302.27		26.47		26.74
2-2-2004		2185.68		298.50		26.22		26.57
3-2-2004		2185.68		298.50		26.22		26.57
4-2-2004		1965.82		297.08		25.96		26.33
5-2-2004		2161.62		296.61		26.17		26.49
6-2-2004		1678.03		295.19		25.63		26.14
7-2-2004		1163.77		293.31		25.12		25.66
8-2-2004		2099.81		295.19		26.14		26.59
9-2-2004		1032.14		290.95		25.04		25.30
10-2-2004		664.14		289.53		24.99		25.32
11-2-2004		775.48		286.23		24.90		24.94
12-2-2004		1400.61		286.23		25.15		25.39
13-2-2004		1543.57		287.65		25.37		25.62
14-2-2004		1822.40		289.06		25.53		25.93
15-2-2004		2813.17		290.95		26.56		26.86
16-2-2004		2084.72		288.59		25.79		26.12
17-2-2004		2972.63		289.53		27.01		27.08
18-2-2004		2568.78		288.12		26.31		26.60
19-2-2004		2571.61		287.65		26.28		26.67
20-2-2004		2566.89		287.65		26.30		26.61
21-2-2004		0.00		514.11		26.13		26.50
22-2-2004		137.14		512.22		26.35		26.66

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
23-2-2004		1211.42		2865.54		41.46		59.41
24-2-2004		1119.42		963.26		34.45		39.44
25-2-2004		1138.29		998.64		42.39		47.58
26-2-2004		1012.32		1021.76		42.71		48.21
27-2-2004		1093.00		1021.76		43.06		48.52
28-2-2004		1093.94		1036.86		43.23		48.68
29-2-2004		1044.88		1017.98		43.27		48.87
1-3-2004		1208.59		1097.72		44.02		49.45
2-3-2004		1248.69		1171.32		44.29		49.55
3-3-2004		1277.47		1198.21		44.30		49.70
4-3-2004		1252.00		1123.67		44.02		48.19
5-3-2004		1240.67		1115.17		44.11		48.23
6-3-2004		1220.38		1148.67		44.10		48.91
7-3-2004		1232.65		1126.97		44.29		48.94
8-3-2004		1141.60		1069.88		44.31		49.12
9-3-2004		1161.41		1088.75		44.48		49.29
10-3-2004		1268.04		1149.14		44.57		49.39
11-3-2004		1210.95		1127.91		44.49		49.70
12-3-2004		1175.56		1096.77		44.47		50.08
13-3-2004		1207.17		1127.91		44.61		50.15
14-3-2004		1105.27		1027.89		44.42		50.95
15-3-2004		1146.31		1080.26		44.31		51.01
16-3-2004		1127.44		1060.92		44.54		50.76
17-3-2004		1202.93		1148.20		44.78		51.10
18-3-2004		1692.18		1425.62		45.37		51.13
19-3-2004		1451.09		1324.18		45.46		51.88
20-3-2004		1251.05		1184.53		45.16		51.14
21-3-2004		1222.74		1164.71		44.77		51.15
22-3-2004		1126.03		1060.92		42.76		50.72
23-3-2004		1444.02		1330.79		45.83		51.80
24-3-2004		1270.87		1193.96		44.84		51.55
25-3-2004		1158.58		1075.07		42.76		50.70
26-3-2004		1280.30		1190.19		44.52		51.07
27-3-2004		1177.92		1115.17		44.07		50.89
28-3-2004		1190.19		1117.53		43.98		50.89
29-3-2004		1124.61		1059.50		44.39		50.79
30-3-2004		1176.98		1106.21		45.68		50.95
31-3-2004		1195.85		1123.67		43.73		51.12
1-4-2004		1193.96		1105.74		43.66		51.03
2-4-2004		1233.60		1137.35		43.60		51.03
3-4-2004		1190.19		1096.30		43.46		50.91
4-4-2004		1176.04		1106.68		43.43		50.88
5-4-2004		1505.82		1359.57		45.64		51.95
6-4-2004		1222.27		1125.08		44.20		51.12
7-4-2004		1110.93		1046.29		42.94		50.91
8-4-2004		1276.06		1177.45		44.90		51.32
9-4-2004		1284.55		1175.56		45.77		51.37
10-4-2004		1281.25		1183.11		45.67		51.36
11-4-2004		1239.26		1128.39		45.60		51.30
12-4-2004		1212.37		1121.78		45.49		51.12

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
13-4-2004		1265.68		1165.66		45.33		51.18
14-4-2004		1265.68		1158.58		45.71		51.33
15-4-2004		1205.76		1140.18		45.70		51.32
16-4-2004		1183.58		1123.20		45.34		51.19
17-4-2004		1206.70		1106.68		45.42		51.29
18-4-2004		1209.06		1139.24		45.40		51.83
19-4-2004		1301.06		1194.91		45.74		52.00
20-4-2004		1194.44		1135.46		45.45		53.14
21-4-2004		1097.72		1052.43		44.38		53.11
22-4-2004		1352.49		1263.32		46.50		53.86
23-4-2004		1147.73		1096.77		44.99		53.59
24-4-2004		1561.96		1427.03		46.96		54.26
25-4-2004		1141.12		1173.68		26.81		55.81
26-4-2004		1239.73		1092.53		53.18		46.09
27-4-2004		1267.57		1127.44		53.37		46.36
28-4-2004		1260.96		1160.94		53.34		46.32
29-4-2004		1261.90		1158.11		53.39		46.24
30-4-2004		1245.39		1108.57		53.40		46.56
1-5-2004		1242.56		1158.11		53.22		46.41
2-5-2004		1260.96		1168.96		53.07		46.23
3-5-2004		1270.40		1175.09		53.07		46.18
4-5-2004		1233.12		1111.40		52.97		46.23
5-5-2004		1122.72		985.90		52.59		45.63
6-5-2004		1122.72		985.90		52.59		45.63
7-5-2004		1122.25		929.29		52.56		45.44
8-5-2004		1042.05		1020.34		44.98		53.02
9-5-2004		1009.49		1028.84		45.11		53.06
10-5-2004		1272.75		1174.15		45.34		53.41
11-5-2004		1203.40		1138.29		45.68		53.59
12-5-2004		1247.28		1153.86		45.39		53.48
13-5-2004		NoRecords		NoRecords		NoRecords		53.74
14-5-2004		NoRecords		NoRecords		NoRecords		53.74
15-5-2004		1251.05		1159.52		44.76		53.74
16-5-2004		1251.05		1159.52		44.76		53.37
17-5-2004		1223.22		1158.11		45.58		53.65
18-5-2004		1212.84		1131.69		46.08		53.94
19-5-2004		1224.16		1132.63		45.78		53.85
20-5-2004		1284.55		1193.96		46.24		54.02
21-5-2004		1287.38		1207.65		46.13		54.22
22-5-2004		1287.38		1207.65		46.13		54.22
23-5-2004		1353.90		1245.86		43.63		53.15
24-5-2004		1360.04		1244.45		45.81		54.06
25-5-2004		1468.55		1318.52		46.47		53.96
26-5-2004		1370.89		1247.28		45.65		53.59
27-5-2004		1147.26		1086.40		45.52		53.17
28-5-2004		1156.22		1093.00		44.34		53.24
29-5-2004		1280.30		1177.45		46.50		53.70
30-5-2004		1275.59		1181.70		46.65		53.80
31-5-2004		1226.52		1164.71		46.82		53.93
1-6-2004		1197.27		1140.65		46.57		53.76

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
2-6-2004		1191.61		1130.74		46.73		53.61
3-6-2004		1253.41		1160.00		46.60		53.44
4-6-2004		969.39		878.33		39.62		46.09
5-6-2004		1180.28		1123.20		46.36		53.48
6-6-2004		1190.19		1125.55		46.45		53.41
7-6-2004		1260.96		1159.05		46.39		53.27
8-6-2004		1217.55		1150.09		46.16		53.24
9-6-2004		1217.55		1150.09		46.16		53.24
10-6-2004		1192.55		1123.67		46.20		53.30
11-6-2004		1297.76		1197.27		46.19		53.36
12-6-2004		1270.87		1178.87		46.19		53.56
13-6-2004		1282.66		1192.55		46.31		53.69
14-6-2004		1273.23		1188.30		46.41		53.94
15-6-2004		55.05		132.42		21.42		21.91
16-6-2004		1259.07		1185.00		46.80		53.11
17-6-2004		1263.79		1165.19		47.05		53.30
18-6-2004		1215.20		1149.14		47.15		53.52
19-6-2004		1193.49		1130.27		47.49		53.71
20-6-2004		1242.09		1156.22		47.29		54.33
21-6-2004		1245.86		1157.64		47.45		54.57
22-6-2004		1264.73		1192.55		47.55		54.74
23-6-2004		1075.07		1006.19		46.58		54.14
24-6-2004		1126.03		899.09		54.01		47.02
25-6-2004		1121.31		941.08		54.17		47.03
26-6-2004		1254.83		1167.54		53.80		47.64
27-6-2004		1231.24		1103.85		53.79		47.84
28-6-2004		1106.68		906.17		53.40		47.11
29-6-2004		1022.70		957.60		46.91		44.64
30-6-2004		1077.90		989.21		47.06		44.71
1-7-2004		1050.07		934.95		46.80		44.56
2-7-2004		1022.23		906.17		46.57		44.47
3-7-2004		1131.22		907.11		46.40		44.79
4-7-2004		1026.01		886.83		46.25		44.60
5-7-2004		1041.10		932.59		46.36		44.62
6-7-2004		1009.02		940.14		46.23		44.50
7-7-2004		1016.57		932.59		46.49		44.79
8-7-2004		1041.58		959.01		46.28		44.80
9-7-2004		1022.70		974.58		46.44		44.94
10-7-2004		1027.89		895.79		46.52		44.74
11-7-2004		992.98		948.63		46.42		44.86
12-7-2004		1036.39		924.10		46.24		44.75
13-7-2004		1031.20		948.16		46.51		45.03
14-7-2004		1011.38		924.10		46.43		45.20
15-7-2004		1010.91		994.40		45.95		44.74
16-7-2004		1011.38		909.47		46.00		44.81
17-7-2004		1105.74		1020.34		46.32		45.05
18-7-2004		1025.06		933.06		46.25		44.90
19-7-2004		1062.81		916.08		46.07		45.01
20-7-2004		1015.63		1029.31		46.17		44.85
21-7-2004		1059.03		915.61		46.01		44.93

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
22-7-2004		1107.63		1013.74		45.96		44.85
23-7-2004		1026.48		929.29		45.89		44.51
24-7-2004		1035.91		894.38		45.79		44.47
25-7-2004		1047.71		925.51		45.64		44.41
26-7-2004		1046.76		927.40		45.85		44.57
27-7-2004		1019.40		998.64		45.78		44.57
28-7-2004		1027.42		915.61		45.92		44.75
29-7-2004		1105.74		1020.82		45.92		44.88
30-7-2004		1141.60		1077.90		45.98		44.88
31-7-2004		1087.34		1023.17		45.72		44.94
1-8-2004		1131.69		1026.95		45.73		44.78
2-8-2004		1176.04		1040.16		51.21		44.95
3-8-2004		1136.41		1034.03		51.45		45.26
4-8-2004		1159.52		1051.48		51.46		45.24
5-8-2004		1180.75		1055.73		51.89		45.23
6-8-2004		1124.61		1042.99		51.61		45.27
7-8-2004		1198.21		1113.29		51.93		46.81
8-8-2004		1102.44		1017.04		52.27		46.93
9-8-2004		1149.62		1048.18		52.12		46.84
10-8-2004		1216.61		1144.43		51.78		45.00
11-8-2004		1180.75		1047.24		51.93		45.41
12-8-2004		1184.06		1053.84		52.21		45.50
13-8-2004		1186.89		1062.81		51.89		45.06
14-8-2004		1148.67		1078.38		52.22		45.17
15-8-2004		1213.78		1100.08		52.35		45.08
16-8-2004		1172.26		1083.09		51.98		45.40
17-8-2004		1315.69		1261.43		52.59		45.60
18-8-2004		1092.06		964.67		49.28		44.87
19-8-2004		1097.25		966.09		52.13		44.66
20-8-2004		1218.50		1132.63		52.41		45.10
21-8-2004		1187.83		1061.86		52.49		45.22
22-8-2004		1139.71		1037.80		52.33		45.20
23-8-2004		1176.04		1051.95		52.16		45.23
24-8-2004		1179.34		1048.18		52.07		45.22
25-8-2004		1124.61		921.27		52.06		45.85
26-8-2004		1093.00		1006.66		52.23		44.69
27-8-2004		1114.70		920.32		52.31		46.13
28-8-2004		1200.57		1114.70		52.30		46.45
29-8-2004		1185.00		1130.74		53.01		46.64
30-8-2004		1183.11		1046.29		52.54		46.62
31-8-2004		1244.45		1148.20		53.25		46.85
1-9-2004		1253.41		1149.14		52.82		46.80
2-9-2004		1222.74		1101.02		52.79		46.72
3-9-2004		1235.48		1128.38		52.32		46.39
4-9-2004		1168.96		1119.42		53.14		46.47
5-9-2004		1206.70		1077.90		53.03		46.84
6-9-2004		1149.14		1031.20		53.09		46.36
7-9-2004		1134.99		1035.44		52.96		46.58
8-9-2004		1134.99		1039.22		52.54		46.59
9-9-2004		1101.96		1004.77		53.07		46.72

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
10-9-2004		1024.12		934.48		44.61		36.53
11-9-2004		1152.92		997.23		41.03		52.53
12-9-2004		1115.65		1037.33		44.02		53.79
13-9-2004		1096.78		994.40		43.09		53.68
14-9-2004		1129.33		1021.29		43.21		54.07
15-9-2004		1160.94		1100.08		43.19		53.71
16-9-2004		1217.55		1119.89		42.72		53.44
17-9-2004		1052.90		953.35		42.44		53.38
18-9-2004		1138.29		1073.18		42.73		53.23
19-9-2004		1199.63		1111.40		42.83		53.14
20-9-2004		1252.00		1150.56		43.08		53.19
21-9-2004		1131.22		1062.33		43.06		53.03
22-9-2004		1097.72		1010.44		43.08		53.31
23-9-2004		1115.17		1028.36		42.92		53.32
24-9-2004		1141.60		1079.79		42.58		52.56
25-9-2004		1145.84		1079.32		42.58		52.84
26-9-2004		909.00		114.97		36.63		33.99
27-9-2004		1028.84		0.00		36.05		23.57
28-9-2004		1118.48		0.00		45.70		23.49
29-9-2004		1039.22		0.00		45.47		23.47
30-9-2004		1017.51		0.00		45.97		22.92
1-10-2004		1028.37		0.00		45.15		21.58
2-10-2004		920.32		2093.68		30.86		55.51
3-10-2004		1020.34		645.27		45.16		23.39
4-10-2004		1032.61		746.23		45.93		22.49
5-10-2004		1018.93		778.31		45.88		21.35
6-10-2004		1061.86		788.69		45.74		23.03
7-10-2004		1077.43		776.43		45.61		21.60
8-10-2004		1012.79		772.18		45.75		21.25
9-10-2004		1071.77		773.12		45.85		21.79
10-10-2004		1027.89		790.11		46.19		23.47
11-10-2004		NoRecords		NoRecords		46.05		NoRecords
12-10-2004		1114.23		793.41		46.05		23.87
13-10-2004		1009.02		793.41		46.20		23.87
14-10-2004		1043.93		795.30		46.03		24.18
15-10-2004		1080.73		789.16		46.25		23.77
16-10-2004		1122.25		789.16		46.25		23.76
17-10-2004		1040.63		789.16		46.07		23.95
18-10-2004		1129.80		788.69		46.21		23.87
19-10-2004		1069.88		787.75		46.21		23.96
20-10-2004		1055.73		787.75		46.50		24.15
21-10-2004		1096.30		772.18		46.14		22.62
22-10-2004		1051.48		772.18		46.58		22.83
23-10-2004		1110.93		768.88		46.32		22.51
24-10-2004		1017.04		772.18		46.36		22.78
25-10-2004		1002.42		784.92		46.46		24.24
26-10-2004		1023.65		789.16		46.16		24.75
27-10-2004		1084.04		773.60		46.27		23.52
28-10-2004		1003.83		783.50		46.78		24.62
29-10-2004		1032.61		818.42		46.58		22.29

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
30-10-2004		1125.08		831.15		47.03		23.25
31-10-2004		1045.35		833.51		46.90		23.36
1-11-2004		1008.55		0.00		45.69		24.38
2-11-2004		1031.20		0.00		45.91		24.13
3-11-2004		1028.37		0.00		45.49		24.03
4-11-2004		1075.07		0.00		45.51		24.15
5-11-2004		1032.14		0.00		37.86		24.56
6-11-2004		1034.97		0.00		45.67		24.42
7-11-2004		1044.41		0.00		46.58		24.42
8-11-2004		1038.74		0.00		46.54		20.78
9-11-2004		1054.31		0.00		46.86		22.54
10-11-2004		1094.42		0.00		46.96		23.44
11-11-2004		1029.31		0.00		46.74		24.36
12-11-2004		1065.17		0.00		46.74		24.63
13-11-2004		1039.22		0.00		47.17		25.20
14-11-2004		1097.72		0.00		46.74		23.83
15-11-2004		1082.62		0.00		47.14		22.59
16-11-2004		1141.12		0.00		47.08		23.44
17-11-2004		1058.09		0.00		47.14		23.46
18-11-2004		990.15		0.00		46.92		23.94
19-11-2004		963.73		0.00		47.08		24.68
20-11-2004		1088.75		0.00		46.74		22.37
21-11-2004		998.17		0.00		46.99		24.02
22-11-2004		980.71		0.00		47.00		23.98
23-11-2004		991.56		0.00		47.16		23.30
24-11-2004		1014.21		0.00		47.34		23.02
25-11-2004		1071.30		0.00		47.05		24.11
26-11-2004		1066.58		0.00		46.94		24.26
27-11-2004		1000.06		0.00		46.91		24.50
28-11-2004		1070.83		0.00		46.76		24.79
29-11-2004		1088.75		0.00		47.03		24.61
30-11-2004		976.47		0.00		47.93		23.15
1-12-2004		1004.77		0.00		48.41		23.40
2-12-2004		1074.60		0.00		48.31		24.12
3-12-2004		973.64		0.00		48.74		24.11
4-12-2004		997.23		0.00		48.37		23.93
5-12-2004		1002.42		0.00		48.41		24.37
6-12-2004		1060.45		0.00		48.21		24.68
7-12-2004		958.54		0.00		48.56		24.87
8-12-2004		951.46		0.00		48.29		25.24
9-12-2004		998.64		0.00		48.04		24.84
10-12-2004		957.12		0.00		48.57		25.56
11-12-2004		1052.90		0.00		48.47		23.17
12-12-2004		1056.67		0.00		47.44		23.96
13-12-2004		1070.83		0.00		48.74		23.95
14-12-2004		976.94		0.00		48.97		25.31
15-12-2004		1062.33		0.00		48.87		25.49
16-12-2004		1055.26		0.00		48.51		24.69
17-12-2004		1035.44		0.00		48.68		25.27
18-12-2004		1005.72		0.00		48.50		25.35

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
19-12-2004		1059.97		0.00		48.56		25.41
20-12-2004		965.14		0.00		48.34		25.37
21-12-2004		955.24		0.00		48.52		25.18
22-12-2004		1031.20		0.00		48.62		25.53
23-12-2004		957.60		0.00		48.93		24.13
24-12-2004		976.94		0.00		49.33		24.29
25-12-2004		953.82		0.00		49.27		25.47
26-12-2004		1046.76		0.00		48.84		25.82
27-12-2004		1040.16		0.00		48.91		25.81
28-12-2004		1029.78		NoRecords		49.09		26.33
29-12-2004		1070.83		0.00		49.19		26.04
30-12-2004		1029.31		0.00		49.66		27.18
31-12-2004		1041.57		0.00		49.46		26.39
1-1-2005		1060.45		0.00		49.52		26.46
2-1-2005		1026.48		0.00		49.33		25.55
3-1-2005		1026.00		0.00		49.62		25.36
4-1-2005		986.85		0.00		46.81		26.42
5-1-2005		945.80		0.00		46.98		26.21
6-1-2005		1083.56		0.00		46.71		26.04
7-1-2005		1059.97		0.00		46.84		25.95
8-1-2005		1076.49		0.00		46.85		25.87
9-1-2005		938.72		0.00		46.99		26.17
10-1-2005		1006.19		0.00		47.32		26.11
11-1-2005		1003.36		0.00		47.15		25.86
12-1-2005		1079.32		0.00		48.56		25.91
13-1-2005		987.32		NoRecords		48.37		25.28
14-1-2005		971.28		NoRecords		48.50		24.56
15-1-2005		991.56		NoRecords		48.26		25.48
16-1-2005		985.43		NoRecords		48.45		26.41
17-1-2005		988.73		2035.18		48.45		26.40
18-1-2005		1035.44		2035.18		33.59		60.00
19-1-2005		1009.02		84.30		49.27		26.53
20-1-2005		1013.74		96.10		50.08		26.71
21-1-2005		1009.02		101.29		50.35		27.22
22-1-2005		1014.68		101.29		50.54		26.73
23-1-2005		1013.27		106.00		50.57		27.33
24-1-2005		1014.21		100.81		50.59		25.99
25-1-2005		1011.85		100.81		50.50		26.04
26-1-2005		1011.85		102.23		50.45		26.79
27-1-2005		1010.91		96.10		50.45		25.20
28-1-2005		1015.63		90.43		50.49		23.95
29-1-2005		1008.55		97.98		50.63		26.00
30-1-2005		1015.15		101.29		50.48		26.41
31-1-2005		1013.74		97.98		50.42		24.97
1-2-2005		1013.74		93.74		50.31		23.85
2-2-2005		1006.19		101.29		50.31		25.87
3-2-2005		1009.49		102.23		50.24		26.50
4-2-2005		136.20		460.32		29.98		29.27
5-2-2005		169.70		1019.40		31.68		33.32
6-2-2005		85.72		880.22		25.06		48.97

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
7-2-2005		85.72		832.57		24.39		35.69
8-2-2005		117.80		706.60		24.52		25.88
9-2-2005		994.40		879.75		34.93		34.10
10-2-2005		1199.15		1104.32		50.47		52.10
11-2-2005		1195.85		1102.91		50.76		53.24
12-2-2005		1201.51		1103.85		50.88		54.25
13-2-2005		1225.10		1129.80		51.17		55.15
14-2-2005		1237.37		1143.48		51.20		55.61
15-2-2005		1216.61		1118.95		51.14		55.85
16-2-2005		1210.01		1115.65		51.39		56.31
17-2-2005		1211.42		1112.82		51.37		56.60
18-2-2005		1218.97		1117.53		51.28		56.84
19-2-2005		1203.87		1109.99		51.11		56.96
20-2-2005		1225.10		1129.33		51.17		57.28
21-2-2005		1229.35		1130.27		51.26		57.42
22-2-2005		1200.57		1105.74		51.11		57.08
23-2-2005		1203.40		1114.23		51.03		56.87
24-2-2005		1209.53		1108.10		50.99		56.64
25-2-2005		1186.89		1086.40		50.80		56.31
26-2-2005		1186.89		1086.40		50.80		56.31
27-2-2005		1244.45		1155.28		50.79		57.89
28-2-2005		1045.35		958.54		50.21		57.62
1-3-2005		1031.20		947.22		50.28		57.96
2-3-2005		1038.74		947.69		50.31		58.19
3-3-2005		1026.95		973.64		50.38		58.52
4-3-2005		1235.48		1142.54		51.03		59.17
5-3-2005		1255.77		1164.24		50.85		59.21
6-3-2005		1221.33		1133.58		50.84		59.48
7-3-2005		1213.78		1120.84		50.66		59.64
8-3-2005		824.08		938.25		26.88		49.60
9-3-2005		1045.82		65.90		37.01		56.56
10-3-2005		1129.80		1026.95		60.00		49.34
11-3-2005		1254.35		1126.03		60.00		50.29
12-3-2005		1307.20		1194.44		60.00		50.22
13-3-2005		1304.37		1200.10		60.00		50.38
14-3-2005		1256.71		1121.31		60.00		50.43
15-3-2005		1292.10		1172.26		60.00		49.94
16-3-2005		1313.33		1171.32		60.00		50.03
17-3-2005		1276.06		1185.00		60.00		50.15
18-3-2005		1248.22		1146.31		60.00		50.12
19-3-2005		1277.47		1171.79		60.00		50.29
20-3-2005		1168.02		1053.37		60.00		49.91
21-3-2005		1294.93		1186.89		60.00		50.38
22-3-2005		1225.10		1093.00		60.00		50.10
23-3-2005		1243.50		1128.86		60.00		49.92
24-3-2005		1168.49		1030.25		60.00		49.43
25-3-2005		1245.39		1118.48		60.00		50.37
26-3-2005		1216.14		1118.01		60.00		50.17
27-3-2005		1203.40		1097.25		61.47		50.21
28-3-2005		1117.53		1034.50		61.58		50.36

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
29-3-2005		1250.11		1184.06		61.56		50.37
30-3-2005		1182.64		1064.22		61.41		50.06
31-3-2005		1213.78		1120.84		61.30		49.80
1-4-2005		1135.46		1051.01		61.60		49.87
2-4-2005		1022.23		885.41		61.26		49.42
3-4-2005		1112.82		900.04		61.23		49.36
4-4-2005		1243.50		1098.19		61.32		49.97
5-4-2005		1256.71		1111.87		61.98		50.49
6-4-2005		1023.17		971.28		49.63		48.29
7-4-2005		1312.86		1152.92		61.20		51.28
8-4-2005		1210.01		1110.93		61.74		51.40
9-4-2005		1124.14		1056.20		61.42		51.37
10-4-2005		1297.29		1159.05		61.55		51.35
11-4-2005		1164.71		1045.82		61.46		51.24
12-4-2005		1176.98		1098.66		61.35		51.18
13-4-2005		1225.10		1107.63		61.40		51.24
14-4-2005		1180.75		1109.04		61.64		51.35
15-4-2005		1111.40		1039.22		62.04		51.41
16-4-2005		1228.88		1098.66		61.61		51.29
17-4-2005		1136.88		1065.17		62.12		51.34
18-4-2005		1101.96		1028.84		61.90		51.22
19-4-2005		1285.96		1154.33		61.74		51.09
20-4-2005		1253.41		1103.85		62.16		51.19
21-4-2005		1102.44		1035.44		62.01		51.31
22-4-2005		1212.84		1095.36		61.73		51.11
23-4-2005		1258.60		1121.78		62.26		51.26
24-4-2005		1272.75		1138.29		62.60		51.48
25-4-2005		1190.19		1074.13		62.03		51.36
26-4-2005		1292.10		1179.34		62.76		51.43
27-4-2005		1267.09		1134.99		62.03		51.28
28-4-2005		1274.64		1164.24		62.28		51.39
29-4-2005		1193.49		1116.12		62.08		51.42
30-4-2005		1122.25		1043.46		62.18		51.34
1-5-2005		1110.46		1047.24		62.24		51.24
2-5-2005		1227.46		1111.40		62.24		51.24
3-5-2005		1133.58		1072.24		62.04		51.24
4-5-2005		1288.80		1134.52		62.88		51.41
5-5-2005		1211.42		1084.98		62.64		51.52
6-5-2005		1236.90		1120.36		62.54		51.38
7-5-2005		1239.73		1121.31		62.61		51.21
8-5-2005		1221.80		1133.57		62.44		51.14
9-5-2005		1229.82		1114.70		62.89		51.39
10-5-2005		1190.19		1036.38		61.90		51.28
11-5-2005		1229.82		1105.74		62.31		51.36
12-5-2005		1238.79		1091.11		62.03		51.21
13-5-2005		1146.31		1077.43		62.35		51.25
14-5-2005		1098.19		1034.03		62.25		51.27
15-5-2005		1136.41		1069.88		62.68		51.26
16-5-2005		1234.54		1065.64		62.38		51.31
17-5-2005		1217.55		1116.59		62.43		51.17

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
18-5-2005		1164.71		1092.06		62.70		51.33
19-5-2005		1113.76		1052.90		62.79		51.39
20-5-2005		1221.80		1107.63		61.82		51.14
21-5-2005		1257.66		1134.99		62.03		51.26
22-5-2005		1096.30		1044.88		62.84		51.38
23-5-2005		1243.50		1107.63		62.50		51.39
24-5-2005		1125.08		1049.12		62.05		51.29
25-5-2005		1109.04		1051.48		62.93		51.53
26-5-2005		1263.79		1130.74		62.54		51.47
27-5-2005		1263.79		1130.74		62.54		51.47
28-5-2005		1163.30		1093.94		62.68		51.41
29-5-2005		961.37		929.76		62.33		51.05
30-5-2005		1141.12		1079.79		63.15		51.46
31-5-2005		1253.41		1102.44		62.40		51.36
1-6-2005		1373.25		1176.04		62.64		51.50
2-6-2005		1138.29		1073.19		62.80		51.34
3-6-2005		1169.90		1031.20		62.52		51.32
4-6-2005		1328.43		1171.79		62.71		51.25
5-6-2005		1192.55		1126.50		63.02		51.51
6-6-2005		1227.46		1075.54		62.45		51.23
7-6-2005		1124.14		1068.94		63.26		51.41
8-6-2005		1211.42		1132.63		62.56		51.25
9-6-2005		1103.85		1044.41		62.75		51.42
10-6-2005		1157.16		1096.78		63.22		51.34
11-6-2005		1155.28		1091.58		62.69		51.22
12-6-2005		1202.93		1130.74		62.99		51.29
13-6-2005		1289.27		1134.52		62.29		51.31
14-6-2005		1263.79		1118.95		61.83		49.60
15-6-2005		1174.15		1091.59		62.54		49.91
16-6-2005		1185.47		1126.50		62.01		49.71
17-6-2005		1102.91		1053.84		62.20		49.74
18-6-2005		1252.00		1188.77		62.32		49.89
19-6-2005		1133.10		961.37		62.31		49.95
20-6-2005		1060.45		1017.04		62.78		49.75
21-6-2005		1052.43		942.03		62.49		49.66
22-6-2005		1011.38		987.32		62.32		49.27
23-6-2005		1177.92		1077.90		63.20		50.43
24-6-2005		1101.02		982.13		63.00		50.24
25-6-2005		1069.88		981.18		62.77		50.00
26-6-2005		1153.86		1068.00		63.09		49.75
27-6-2005		1193.49		1106.68		63.38		50.08
28-6-2005		1197.27		1088.75		62.98		50.01
29-6-2005		1322.29		1145.37		62.51		49.90
30-6-2005		1076.96		966.56		62.51		49.61
1-7-2005		1093.47		1025.06		62.16		49.73
2-7-2005		1291.63		1104.32		62.83		50.22
3-7-2005		936.36		976.94		62.41		49.27
4-7-2005		1024.59		943.91		62.48		49.39
5-7-2005		1157.64		863.24		62.14		49.26
6-7-2005		1190.19		900.51		61.86		49.48

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
7-7-2005		1197.27		992.51		61.92		49.38
8-7-2005		1018.93		962.79		51.56		50.26
9-7-2005		1031.20		932.59		51.89		49.48
10-7-2005		1003.36		943.91		48.57		49.14
11-7-2005		1024.59		945.33		50.21		49.59
12-7-2005		1423.73		1288.80		57.65		50.06
13-7-2005		1032.14		958.07		64.17		50.23
14-7-2005		106.48		981.18		22.41		48.47
15-7-2005		118.74		881.64		21.96		49.18
16-7-2005		129.59		900.51		22.43		49.27
17-7-2005		128.18		854.74		22.97		49.08
18-7-2005		130.07		878.81		22.73		49.13
19-7-2005		137.14		860.88		23.63		49.32
20-7-2005		137.14		856.16		20.74		49.01
21-7-2005		147.05		942.50		21.95		49.29
22-7-2005		144.69		951.46		22.47		49.11
23-7-2005		145.16		911.83		22.50		49.11
24-7-2005		147.52		944.38		23.63		48.98
25-7-2005		148.47		990.15		23.37		49.03
26-7-2005		149.88		914.66		22.55		49.13
27-7-2005		150.35		896.73		22.21		49.30
28-7-2005		151.77		930.70		21.34		49.29
29-7-2005		152.71		930.70		22.57		49.54
30-7-2005		154.60		913.25		22.03		49.32
31-7-2005		154.60		957.60		22.55		49.39
1-8-2005		154.60		987.32		22.26		49.22
2-8-2005		151.77		969.86		22.60		49.37
3-8-2005		151.77		969.86		22.60		49.37
4-8-2005		154.13		907.11		23.06		49.39
5-8-2005		152.71		880.22		22.47		49.49
6-8-2005		1326.07		962.79		54.82		34.32
7-8-2005		1123.67		276.32		35.92		27.65
8-8-2005		1090.64		182.43		57.85		23.53
9-8-2005		1246.33		182.91		64.23		22.91
10-8-2005		1207.65		150.35		63.64		23.55
11-8-2005		1195.85		162.15		63.47		24.44
12-8-2005		1207.17		119.21		63.69		23.19
13-8-2005		1206.70		97.98		63.72		23.31
14-8-2005		1205.76		86.66		63.67		23.04
15-8-2005		1209.53		95.15		63.70		23.60
16-8-2005		1222.27		93.74		63.74		23.56
17-8-2005		1210.01		97.51		63.68		23.54
18-8-2005		1208.59		97.51		63.31		23.24
19-8-2005		1206.70		107.42		63.12		23.64
20-8-2005		1204.82		109.31		63.31		23.72
21-8-2005		1206.23		115.91		63.48		23.70
22-8-2005		1203.87		112.14		63.39		23.31
23-8-2005		1196.80		114.97		63.45		23.13
24-8-2005		1203.40		112.61		63.31		23.38
25-8-2005		1226.99		111.67		63.31		23.84

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
26-8-2005		1247.75		108.83		63.43		22.60
27-8-2005		1203.40		108.83		63.27		23.34
28-8-2005		1205.76		126.76		63.26		23.70
29-8-2005		1185.94		121.10		63.40		23.38
30-8-2005		1200.57		119.69		63.38		23.61
31-8-2005		1210.48		114.02		63.41		23.81
1-9-2005		1207.17		113.08		63.05		23.55
2-9-2005		1226.99		112.61		63.20		23.23
3-9-2005		1202.46		112.14		63.29		23.72
4-9-2005		1209.06		121.10		63.35		23.72
5-9-2005		1203.87		116.86		63.26		23.52
6-9-2005		1205.76		117.33		63.31		23.73
7-9-2005		1204.34		109.31		63.43		22.88
8-9-2005		1209.06		104.59		63.55		22.54
9-9-2005		1207.17		100.81		63.51		22.39
10-9-2005		1203.40		95.15		63.45		22.30
11-9-2005		1204.34		93.74		63.31		22.76
12-9-2005		1201.51		95.62		63.31		23.18
13-9-2005		1203.40		93.27		63.33		23.22
14-9-2005		1197.27		86.66		63.28		21.55
15-9-2005		1201.04		83.83		63.32		22.08
16-9-2005		1204.34		81.94		63.29		22.96
17-9-2005		1201.04		81.00		63.14		23.58
18-9-2005		1206.70		77.22		63.03		22.23
19-9-2005		1201.51		72.98		62.85		21.95
20-9-2005		1205.76		71.56		62.64		22.74
21-9-2005		1203.87		66.37		62.62		22.04
22-9-2005		1198.68		65.43		62.57		22.38
23-9-2005		1202.93		64.01		62.51		22.49
24-9-2005		1200.57		62.13		62.54		22.64
25-9-2005		1204.82		62.13		62.46		23.62
26-9-2005		1209.06		61.18		62.19		23.85
27-9-2005		1197.27		59.30		62.17		22.47
28-9-2005		1225.10		56.47		62.30		20.93
29-9-2005		1205.29		57.88		62.15		22.71
30-9-2005		1202.46		55.99		62.34		22.22
1-10-2005		1202.93		53.16		62.23		22.35
2-10-2005		1203.87		55.99		62.10		22.68
3-10-2005		1200.10		56.47		62.01		23.67
4-10-2005		1203.87		57.88		61.82		23.33
5-10-2005		1876.18		750.95		57.76		41.87
6-10-2005		256.04		181.96		23.62		23.95
7-10-2005		12569.90		516.94		23.34		23.57
8-10-2005		987.32		2454.13		45.35		59.95
9-10-2005		1147.26		1004.30		58.16		48.77
10-10-2005		1308.14		1200.57		60.38		50.86
11-10-2005		1178.40		1161.88		61.77		51.36
12-10-2005		1156.69		1149.14		62.56		51.49
13-10-2005		1254.83		1143.01		61.04		50.73
14-10-2005		1302.01		1202.93		61.52		51.00

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
15-10-2005		1149.14		1083.56		61.88		51.12
16-10-2005		1162.83		1079.79		61.46		51.07
17-10-2005		920.32		940.14		61.35		50.75
18-10-2005		1221.80		1188.30		61.90		51.26
19-10-2005		1016.57		1024.12		61.64		51.29
20-10-2005		1037.33		1030.72		54.74		51.27
21-10-2005		1056.67		1062.33		62.34		51.64
22-10-2005		1173.88		1121.78		62.14		51.21
23-10-2005		1314.74		1211.89		62.03		50.98
24-10-2005		1007.61		1016.10		61.89		50.81
25-10-2005		1393.06		1258.60		63.04		51.20
26-10-2005		1193.49		1166.13		62.70		50.94
27-10-2005		983.54		995.34		63.10		51.25
28-10-2005		1057.62		1058.09		63.40		51.20
29-10-2005		1000.06		1000.53		63.00		50.98
30-10-2005		1030.25		1032.61		63.45		51.23
31-10-2005		999.11		995.34		63.27		51.29
1-11-2005		1071.30		1045.82		63.81		51.34
2-11-2005		1006.19		996.75		63.87		51.68
3-11-2005		1103.85		1067.05		63.52		51.61
4-11-2005		1144.43		1031.20		63.07		51.26
5-11-2005		961.37		951.46		62.45		50.83
6-11-2005		1010.91		952.41		62.21		50.72
7-11-2005		1145.37		950.99		62.23		50.86
8-11-2005		984.49		947.22		62.13		50.67
9-11-2005		1167.54		943.91		61.53		50.81
10-11-2005		1010.44		987.32		62.08		51.30
11-11-2005		1121.31		1061.86		61.82		51.23
12-11-2005		1073.19		1029.31		61.58		51.16
13-11-2005		1109.04		1072.24		61.74		51.19
14-11-2005		1108.57		979.30		61.32		50.99
15-11-2005		1052.90		1009.02		61.56		51.10
16-11-2005		1119.42		1078.85		61.14		50.95
17-11-2005		1171.79		1076.02		60.84		51.09
18-11-2005		1185.00		1126.97		61.49		51.12
19-11-2005		1049.60		1019.40		61.51		51.22
20-11-2005		1175.09		1060.92		61.51		51.24
21-11-2005		1150.09		1123.67		61.62		51.19
22-11-2005		1273.23		1164.71		62.14		51.33
23-11-2005		1079.79		1051.48		62.06		51.17
24-11-2005		1160.94		1073.66		62.24		51.19
25-11-2005		1027.42		998.17		61.77		51.13
26-11-2005		1255.77		1168.02		62.05		51.15
27-11-2005		1132.63		1106.21		62.67		51.13
28-11-2005		1219.91		1167.54		62.78		51.15
29-11-2005		1266.62		1117.53		62.97		51.53
30-11-2005		1344.47		1218.03		62.62		51.40
1-12-2005		1043.93		1016.57		62.19		51.21
2-12-2005		1064.22		1042.99		62.87		51.45
3-12-2005		1187.83		1084.04		62.48		51.27

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
4-12-2005		1226.52		1193.96		62.66		51.36
5-12-2005		1071.77		1040.63		61.92		51.31
6-12-2005		1256.24		1139.71		61.77		51.27
7-12-2005		1046.29		1024.12		61.77		51.29
8-12-2005		1173.21		1142.07		62.16		51.49
9-12-2005		1157.17		1056.67		61.29		51.16
10-12-2005		1173.21		1062.81		61.39		51.30
11-12-2005		1188.30		1146.79		61.22		51.25
12-12-2005		1368.53		1236.43		61.78		51.45
13-12-2005		1201.99		1164.71		62.01		51.62
14-12-2005		1092.06		1010.91		61.41		51.48
15-12-2005		1181.23		1068.47		61.31		51.60
16-12-2005		1231.71		1203.87		61.80		51.61
17-12-2005		1256.71		1151.97		60.85		51.38
18-12-2005		1217.08		1089.23		60.63		51.31
19-12-2005		1145.37		1119.42		60.96		51.38
20-12-2005		1114.70		1069.41		60.63		51.52
21-12-2005		1050.54		1006.66		51.91		39.28
22-12-2005		1294.46		1194.44		60.80		51.90
23-12-2005		1072.71		1009.49		60.09		51.74
24-12-2005		1097.25		1065.64		59.58		51.52
25-12-2005		1012.79		986.38		59.59		51.38
26-12-2005		1072.71		1056.67		59.86		51.36
27-12-2005		1012.32		988.26		60.10		51.48
28-12-2005		1260.02		1120.37		60.47		51.86
29-12-2005		630.64		582.99		32.88		30.80
30-12-2005		1209.53		1104.79		60.07		51.63
31-12-2005		965.62		915.13		49.62		50.20
1-1-2006		1260.49		1138.77		60.29		51.61
2-1-2006		1104.32		1052.90		60.63		51.69
3-1-2006		1206.70		1168.49		59.96		51.58
4-1-2006		1144.90		1103.85		60.34		51.72
5-1-2006		1107.63		1080.26		60.29		51.60
6-1-2006		1155.28		1130.27		60.09		51.53
7-1-2006		1315.69		1193.02		60.26		51.72
8-1-2006		1059.50		1041.10		60.03		51.70
9-1-2006		1112.34		1086.40		59.98		51.59
10-1-2006		974.11		955.71		59.31		51.03
11-1-2006		1022.23		955.71		59.52		51.00
12-1-2006		1081.21		1026.95		54.41		50.18
13-1-2006		1189.72		1084.98		60.08		51.33
14-1-2006		1109.04		1082.62		60.13		51.43
15-1-2006		1106.21		1080.73		59.79		51.30
16-1-2006		1173.68		1129.33		59.95		51.45
17-1-2006		1040.63		1020.34		59.84		51.51
18-1-2006		1083.09		1049.60		59.56		51.40
19-1-2006		1076.96		1057.14		59.66		51.38
20-1-2006		600.45		862.29		28.67		27.27
21-1-2006		965.14		965.62		60.46		51.26
22-1-2006		945.33		953.82		60.07		51.03

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
23-1-2006		1055.26		1028.36		60.71		51.55
24-1-2006		1009.49		989.21		61.10		51.52
25-1-2006		1105.74		1085.92		61.34		51.50
26-1-2006		1202.93		1137.82		61.08		51.31
27-1-2006		1344.47		1207.65		61.72		51.74
28-1-2006		1113.76		1036.86		61.95		51.66
29-1-2006		1303.42		1162.35		62.07		51.60
30-1-2006		1256.71		1164.71		61.66		51.37
31-1-2006		1161.88		1044.41		62.22		51.59
1-2-2006		1209.53		1162.83		62.66		51.77
2-2-2006		1082.15		1064.22		62.42		51.69
3-2-2006		938.72		944.39		62.43		51.15
4-2-2006		1176.04		939.67		61.93		51.03
5-2-2006		942.03		957.12		62.10		51.10
6-2-2006		1164.24		983.07		61.95		51.23
7-2-2006		1089.70		962.78		62.28		51.01
8-2-2006		994.40		946.27		62.73		50.97
9-2-2006		1152.45		1134.99		62.79		51.43
10-2-2006		1390.70		1272.28		58.24		51.87
11-2-2006		1004.30		975.52		44.19		51.46
12-2-2006		1074.60		1055.73		63.45		51.91
13-2-2006		1021.76		997.23		49.63		51.56
14-2-2006		1186.89		1126.03		54.69		51.60
15-2-2006		1234.54		1194.44		63.12		51.57
16-2-2006		1089.70		1070.83		63.13		51.61
17-2-2006		1395.89		1269.45		58.09		51.90
18-2-2006		1137.35		1065.17		62.69		51.59
19-2-2006		1055.73		1042.99		63.50		52.06
20-2-2006		1126.03		1107.15		63.84		52.09
21-2-2006		1043.46		1033.08		63.63		52.24
22-2-2006		1142.54		1128.39		64.73		52.26
23-2-2006		1213.78		1158.11		62.51		51.77
24-2-2006		1233.59		1080.73		64.29		52.27
25-2-2006		1196.32		1078.85		64.03		52.13
26-2-2006		988.73		974.11		63.10		51.89
27-2-2006		1182.17		1118.01		63.90		51.91
28-2-2006		1193.02		1168.96		63.63		51.84
1-3-2006		1155.75		1133.58		64.11		52.22
2-3-2006		973.17		962.31		63.33		51.73
3-3-2006		993.45		978.83		63.72		51.97
4-3-2006		964.67		953.35		62.66		51.59
5-3-2006		1253.41		1223.22		64.20		52.11
6-3-2006		1093.94		1026.95		62.02		51.66
7-3-2006		1201.51		1166.13		63.63		52.19
8-3-2006		976.47		965.14		63.72		52.18
9-3-2006		1248.22		1214.72		64.44		52.59
10-3-2006		1353.90		1195.38		64.64		52.58
11-3-2006		1025.06		963.26		64.45		52.65
12-3-2006		1318.99		1171.32		63.61		51.89
13-3-2006		1088.75		1074.13		64.01		52.30

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
14-3-2006		1142.54		1115.65		64.72		52.54
15-3-2006		963.26		949.58		63.53		51.88
16-3-2006		996.75		985.43		63.54		52.11
17-3-2006		961.37		952.88		63.53		52.02
18-3-2006		1167.54		1090.17		62.88		51.65
19-3-2006		944.38		937.31		63.51		51.77
20-3-2006		1550.17		1304.37		64.08		52.14
21-3-2006		1068.94		1072.71		64.32		52.58
22-3-2006		943.91		939.67		62.88		51.74
23-3-2006		940.14		921.27		63.67		51.69
24-3-2006		975.52		909.00		63.96		51.69
25-3-2006		1306.72		1176.04		63.58		52.13
26-3-2006		1039.22		1026.95		62.80		52.05
27-3-2006		1163.30		1080.26		62.29		51.88
28-3-2006		1151.50		1121.31		63.38		52.59
29-3-2006		1220.86		1049.59		63.17		52.53
30-3-2006		1313.80		1201.04		62.48		52.20
31-3-2006		1190.66		1111.87		61.52		52.01
1-4-2006		1066.58		1055.73		62.42		52.48
2-4-2006		1169.90		1157.17		61.85		52.12
3-4-2006		1024.12		1024.12		62.13		52.59
4-4-2006		1235.96		1161.41		61.69		52.23
5-4-2006		1057.62		1045.35		61.92		52.23
6-4-2006		1061.86		1047.71		61.92		52.41
7-4-2006		915.61		939.67		61.08		51.80
8-4-2006		1101.96		1085.92		61.87		52.34
9-4-2006		1044.41		1026.48		61.41		52.32
10-4-2006		1042.05		1028.84		61.58		52.43
11-4-2006		1062.81		1053.84		61.94		52.45
12-4-2006		1173.21		1047.24		61.59		52.37
13-4-2006		1053.37		1041.58		61.71		52.55
14-4-2006		1037.33		1025.53		61.43		52.35
15-4-2006		1067.52		1053.37		61.55		52.42
16-4-2006		1101.49		1084.04		61.12		52.02
17-4-2006		1081.21		1063.75		60.92		52.21
18-4-2006		1095.36		1025.53		60.19		51.74
19-4-2006		1198.68		1136.41		60.60		52.01
20-4-2006		1086.40		1060.45		60.86		52.06
21-4-2006		1059.97		1042.99		60.63		51.96
22-4-2006		1221.80		1130.27		60.31		51.91
23-4-2006		1009.49		999.11		60.25		51.88
24-4-2006		1329.84		1101.49		60.14		51.74
25-4-2006		1050.07		1046.29		60.10		51.71
26-4-2006		1032.14		1025.53		60.03		51.77
27-4-2006		988.73		992.04		59.86		51.96
28-4-2006		1073.66		1070.83		60.20		52.01
29-4-2006		1093.94		1076.49		60.30		52.07
30-4-2006		1063.28		985.90		59.76		51.87
1-5-2006		1221.80		1121.31		59.63		51.89
2-5-2006		1117.06		1101.96		60.35		51.78

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
3-5-2006		1092.06		1100.08		60.66		51.82
4-5-2006		1219.44		1194.91		60.96		51.75
5-5-2006		886.83		923.63		60.96		51.32
6-5-2006		1043.46		1029.78		61.09		51.84
7-5-2006		1015.15		1008.08		61.39		51.83
8-5-2006		1058.09		1055.73		61.82		51.70
9-5-2006		994.40		997.23		61.81		51.81
10-5-2006		1127.91		1066.11		60.34		51.21
11-5-2006		1039.69		1031.20		62.00		51.75
12-5-2006		1036.86		990.15		61.92		51.70
13-5-2006		1009.96		1002.42		61.82		51.63
14-5-2006		1096.78		1033.08		61.47		51.48
15-5-2006		1084.98		1080.73		62.27		51.62
16-5-2006		976.00		973.17		61.98		51.59
17-5-2006		1093.94		1082.62		63.23		52.07
18-5-2006		1085.92		934.48		61.96		51.30
19-5-2006		1199.16		1106.21		62.16		51.29
20-5-2006		1224.16		1207.65		63.79		51.92
21-5-2006		1177.45		1167.54		63.30		51.84
22-5-2006		1137.35		1122.72		62.81		51.64
23-5-2006		1040.16		1031.20		62.89		51.69
24-5-2006		1057.14		1048.18		63.46		51.93
25-5-2006		1208.12		1144.90		63.78		52.12
26-5-2006		1049.12		1019.40		63.45		51.71
27-5-2006		1117.53		1094.89		63.69		51.92
28-5-2006		1032.14		1031.20		63.53		52.11
29-5-2006		1056.67		1058.56		63.60		52.11
30-5-2006		1174.62		1159.52		64.10		52.05
31-5-2006		1187.83		1152.92		63.78		51.91
1-6-2006		1185.94		1172.73		63.82		51.77
2-6-2006		1044.41		1038.74		64.03		52.04
3-6-2006		1255.30		1159.05		63.38		51.81
4-6-2006		1177.45		1161.41		64.17		51.88
5-6-2006		1135.46		1104.80		63.71		51.83
6-6-2006		1128.86		1045.35		62.87		51.70
7-6-2006		1166.13		1126.03		62.91		51.78
8-6-2006		1115.17		1102.44		62.88		52.00
9-6-2006		1059.50		1053.84		62.54		51.93
10-6-2006		928.82		985.90		61.50		51.72
11-6-2006		1241.14		1152.92		62.01		52.00
12-6-2006		1134.05		1120.36		61.85		51.87
13-6-2006		1163.30		952.88		61.39		51.74
14-6-2006		1009.49		982.60		61.85		52.23
15-6-2006		1004.77		940.61		61.47		52.24
16-6-2006		1168.96		1053.37		60.79		51.86
17-6-2006		1181.23		1113.29		61.76		52.13
18-6-2006		1216.14		1041.10		61.43		52.13
19-6-2006		1068.00		994.87		60.91		51.82
20-6-2006		1170.85		1051.01		60.43		51.71
21-6-2006		1069.41		1009.49		61.06		52.09

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
22-6-2006		1024.59		967.03		60.97		51.98
23-6-2006		1131.22		1023.65		60.25		51.63
24-6-2006		1052.90		996.28		60.69		51.83
25-6-2006		980.71		913.25		31.90		51.51
26-6-2006		1076.49		1020.82		60.89		52.09
27-6-2006		1084.04		1006.19		60.55		52.03
28-6-2006		1052.90		988.73		60.47		51.90
29-6-2006		1035.91		991.09		60.64		51.90
30-6-2006		1023.65		963.73		60.33		51.98
1-7-2006		1114.70		1070.35		60.57		51.99
2-7-2006		1074.13		1046.29		60.88		51.86
3-7-2006		1086.87		1049.12		61.44		52.03
4-7-2006		980.24		956.18		60.43		51.57
5-7-2006		1051.48		1024.12		61.54		51.67
6-7-2006		1110.46		1024.59		61.99		51.94
7-7-2006		1126.03		1096.30		62.49		52.06
8-7-2006		1115.65		1096.78		61.77		51.69
9-7-2006		1305.31		940.14		62.04		51.23
10-7-2006		1050.07		991.56		62.13		51.80
11-7-2006		1389.76		1180.75		63.19		51.78
12-7-2006		989.21		947.69		63.19		51.32
13-7-2006		1242.56		936.84		63.61		51.27
14-7-2006		904.28		944.86		63.58		51.26
15-7-2006		1152.92		1129.80		64.83		51.91
16-7-2006		1043.93		1025.06		64.43		51.76
17-7-2006		1337.39		1198.21		64.38		51.70
18-7-2006		1222.27		1215.20		64.78		51.82
19-7-2006		1053.37		1047.24		64.91		52.04
20-7-2006		1009.02		1005.25		63.84		51.84
21-7-2006		1327.48		1185.94		64.77		51.82
22-7-2006		1105.74		1094.42		64.55		51.81
23-7-2006		1172.26		1050.54		64.75		51.96
24-7-2006		1203.40		1194.44		64.01		51.69
25-7-2006		1061.86		1050.54		64.64		52.00
26-7-2006		1216.61		1172.73		64.64		52.04
27-7-2006		1035.91		1022.23		64.33		52.20
28-7-2006		1137.82		1128.86		64.78		52.12
29-7-2006		1020.34		1017.98		64.08		52.12
30-7-2006		1028.37		1010.91		43.07		51.63
31-7-2006		1001.47		1004.78		43.91		51.83
1-8-2006		1001.47		1004.78		43.91		51.83
2-8-2006		1047.71		1044.88		61.75		52.23
3-8-2006		1168.02		1004.78		65.89		51.93
4-8-2006		1155.28		1155.28		65.25		52.14
5-8-2006		1043.93		1048.65		63.58		52.21
6-8-2006		1033.08		1037.33		63.30		52.31
7-8-2006		1027.42		1031.20		62.93		52.05
8-8-2006		1252.47		1215.20		63.10		52.03
9-8-2006		1169.90		1163.30		61.46		51.89
10-8-2006		1278.42		1243.97		61.18		51.94

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
11-8-2006		1074.13		1047.71		60.47		51.74
12-8-2006		1115.17		1069.41		60.69		51.89
13-8-2006		1288.32		1180.28		60.10		51.72
14-8-2006		1047.24		1057.14		60.63		52.16
15-8-2006		1282.19		1181.70		59.98		51.73
16-8-2006		1115.17		1104.80		61.15		52.04
17-8-2006		1074.60		1077.43		60.84		51.99
18-8-2006		1169.90		1084.04		61.15		52.18
19-8-2006		1076.02		1071.77		60.49		52.05
20-8-2006		1105.27		1084.51		60.53		51.86
21-8-2006		1118.95		1115.17		60.74		52.06
22-8-2006		1133.58		1119.42		60.47		51.96
23-8-2006		1046.29		1053.37		60.39		51.96
24-8-2006		1068.94		1051.01		60.07		51.79
25-8-2006		1076.49		1081.21		60.61		52.12
26-8-2006		1224.16		1213.31		60.20		51.78
27-8-2006		1113.29		1110.46		60.35		52.31
28-8-2006		1144.90		1064.69		59.20		51.68
29-8-2006		1119.42		1116.12		60.35		51.99
30-8-2006		1150.56		1139.71		59.94		51.79
31-8-2006		1160.94		1167.07		60.59		52.27
1-9-2006		1192.55		1130.74		59.23		51.96
2-9-2006		1252.47		1235.48		59.81		51.71
3-9-2006		1009.02		1016.57		59.16		51.50
4-9-2006		1117.53		1122.25		60.42		51.63
5-9-2006		1095.36		1066.58		60.89		51.66
6-9-2006		1028.84		1056.20		60.84		51.84
7-9-2006		1124.61		1140.18		62.14		52.32
8-9-2006		1087.34		1056.67		61.34		51.89
9-9-2006		1017.04		1060.45		61.10		51.76
10-9-2006		1150.56		1079.32		61.54		51.38
11-9-2006		1248.22		1320.41		62.25		51.82
12-9-2006		1021.29		1125.55		61.11		51.55
13-9-2006		1024.59		1133.58		62.06		51.87
14-9-2006		1166.60		1253.41		62.08		51.77
15-9-2006		1402.97		1317.58		61.75		51.62
16-9-2006		1177.92		1250.11		62.26		51.63
17-9-2006		1008.55		1103.38		62.12		51.76
18-9-2006		1011.38		1109.99		62.29		51.97
19-9-2006		1182.64		1265.21		63.26		52.11
20-9-2006		1085.45		1172.73		63.36		52.34
21-9-2006		1252.47		1280.30		62.27		51.80
22-9-2006		1263.32		1345.41		63.48		51.95
23-9-2006		1037.80		1134.52		62.92		52.08
24-9-2006		1009.02		1123.20		62.45		52.10
25-9-2006		1238.31		1243.03		61.82		51.62
26-9-2006		1096.77		1183.58		63.34		52.22
27-9-2006		1101.02		1183.11		62.53		52.03
28-9-2006		1211.89		1283.61		63.87		52.57
29-9-2006		1058.56		1135.46		62.01		52.11

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
30-9-2006		1252.94		1262.38		62.35		51.94
1-10-2006		1338.33		1362.40		63.47		51.91
2-10-2006		1204.34		1212.37		62.13		51.77
3-10-2006		1070.83		1105.74		62.04		51.74
4-10-2006		1308.14		1356.26		63.15		51.92
5-10-2006		1104.80		1177.45		62.93		52.28
6-10-2006		1134.99		1165.66		60.80		51.42
7-10-2006		1318.99		1342.58		62.33		51.94
8-10-2006		1021.29		1094.89		61.58		52.04
9-10-2006		1242.56		1292.57		62.04		51.98
10-10-2006		853.80		2446.58		39.10		56.34
11-10-2006		212.63		235.75		22.64		22.99
12-10-2006		66.37		237.63		22.75		23.13
13-10-2006		67.32		237.63		23.10		23.49
14-10-2006		70.15		233.86		22.82		23.23
15-10-2006		70.15		235.75		22.70		23.02
16-10-2006		72.98		236.22		23.11		23.42
17-10-2006		70.62		234.80		23.33		23.62
18-10-2006		71.09		232.45		23.44		23.76
19-10-2006		71.09		231.50		22.09		22.39
20-10-2006		69.20		225.37		19.25		19.56
21-10-2006		808.98		2084.24		40.50		62.34
22-10-2006		1037.80		1109.04		60.74		50.28
23-10-2006		1376.08		1322.77		61.34		50.98
24-10-2006		1116.12		1187.36		61.70		51.64
25-10-2006		1003.36		1077.43		60.29		51.15
26-10-2006		1233.60		1219.44		60.00		50.99
27-10-2006		1038.27		1113.76		60.13		51.31
28-10-2006		1004.30		1084.51		59.30		51.13
29-10-2006		1014.68		1092.06		59.70		51.47
30-10-2006		1046.29		1113.29		60.80		51.90
31-10-2006		1063.75		1130.27		60.58		51.91
1-11-2006		1159.52		1199.15		60.36		51.81
2-11-2006		1163.30		1046.76		60.41		51.24
3-11-2006		1093.47		1041.10		59.87		51.26
4-11-2006		1020.82		1081.68		61.19		51.82
5-11-2006		1020.82		1081.68		61.19		51.82
6-11-2006		1269.45		1213.31		61.57		51.70
7-11-2006		1270.40		1226.52		61.18		51.68
8-11-2006		1296.34		1168.49		61.25		51.44
9-11-2006		1050.07		1018.46		62.46		52.16
10-11-2006		1011.38		990.62		61.63		51.66
11-11-2006		1357.68		1276.53		62.51		51.81
12-11-2006		1293.04		1249.64		63.16		51.94
13-11-2006		1018.46		1027.89		62.76		52.25
14-11-2006		1235.96		1150.09		62.33		51.81
15-11-2006		1027.89		1033.55		61.80		52.05
16-11-2006		1100.55		1066.58		61.17		51.36
17-11-2006		1002.89		1018.93		61.44		51.34
18-11-2006		1037.33		1051.95		62.41		51.87

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
19-11-2006		1038.27		1064.22		62.60		51.94
20-11-2006		998.17		990.15		61.80		51.52
21-11-2006		1233.12		929.76		61.77		51.56
22-11-2006		1152.92		893.90		63.75		52.36
23-11-2006		1029.78		758.50		63.21		52.32
24-11-2006		1170.38		887.77		63.69		52.17
25-11-2006		1115.17		780.67		61.90		51.55
26-11-2006		1133.58		830.68		63.49		52.19
27-11-2006		1270.40		1185.00		63.57		51.93
28-11-2006		1310.97		1162.83		62.79		51.82
29-11-2006		1048.65		980.71		63.29		52.29
30-11-2006		1029.78		972.22		63.60		52.40
1-12-2006		1199.63		1168.02		64.15		52.37
2-12-2006		1109.99		1101.96		64.06		52.53
3-12-2006		1078.85		1026.95		62.96		51.92
4-12-2006		1143.95		1085.92		62.37		51.77
5-12-2006		1220.86		1145.37		61.92		51.84
6-12-2006		1201.51		1122.72		62.54		51.80
7-12-2006		1093.47		1077.43		63.56		51.97
8-12-2006		1036.39		1007.61		51.07		51.71
9-12-2006		1036.39		1007.61		51.07		51.71
10-12-2006		998.17		976.94		47.21		51.66
11-12-2006		997.70		976.94		38.34		51.72
12-12-2006		1672.37		1310.97		59.81		52.43
13-12-2006		962.79		868.90		60.69		48.84
14-12-2006		1303.89		1176.04		64.30		51.76
15-12-2006		1002.42		947.69		61.21		52.10
16-12-2006		1065.16		1021.76		61.62		53.01
17-12-2006		1027.42		980.71		59.53		52.86
18-12-2006		1003.36		970.80		60.02		52.88
19-12-2006		1246.81		1168.02		65.11		53.89
20-12-2006		1108.57		981.19		64.32		53.38
21-12-2006		1386.46		1299.17		64.32		54.11
22-12-2006		1015.15		976.00		58.95		53.37
23-12-2006		1154.33		947.21		64.81		53.35
24-12-2006		1147.73		951.93		64.50		53.35
25-12-2006		1140.65		1061.39		60.06		53.51
26-12-2006		1282.19		1202.46		62.84		53.92
27-12-2006		1015.15		966.56		55.17		53.42
28-12-2006		1014.68		967.50		54.95		53.49
29-12-2006		1070.35		1044.41		64.89		54.05
30-12-2006		1021.29		992.04		64.67		53.58
31-12-2006		1342.11		1279.36		64.62		53.69
1-1-2007		1028.84		998.64		64.03		53.72
2-1-2007		952.41		962.31		64.26		53.25
3-1-2007		1309.55		1192.55		63.81		53.38
4-1-2007		1292.57		1176.51		63.63		53.28
5-1-2007		1035.91		1001.94		64.11		53.66
6-1-2007		1085.45		1040.16		64.67		53.83
7-1-2007		1029.78		987.32		63.57		53.46

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
8-1-2007		1021.76		971.75		63.43		53.37
9-1-2007		1294.93		1169.43		63.78		53.38
10-1-2007		1261.43		1129.80		64.04		53.37
11-1-2007		1027.42		982.13		64.15		53.64
12-1-2007		1022.70		975.52		63.77		53.52
13-1-2007		1019.87		959.48		55.37		52.84
14-1-2007		1148.67		1101.49		64.88		53.98
15-1-2007		955.71		957.12		64.63		53.32
16-1-2007		964.20		924.10		63.58		53.10
17-1-2007		1150.56		984.49		63.49		53.11
18-1-2007		968.92		954.29		63.57		53.74
19-1-2007		1246.81		939.67		63.42		53.77
20-1-2007		1410.52		938.72		63.71		53.79
21-1-2007		1176.04		944.38		62.58		53.68
22-1-2007		928.34		938.25		63.95		53.82
23-1-2007		930.70		931.65		63.83		53.82
24-1-2007		945.33		942.03		64.70		54.03
25-1-2007		855.69		2250.79		34.74		54.29
26-1-2007		1003.83		0.00		41.66		26.12
27-1-2007		1070.35		0.00		64.72		26.42
28-1-2007		951.93		0.00		64.36		26.47
29-1-2007		923.63		0.00		63.58		26.53
30-1-2007		956.65		0.00		62.53		26.38
31-1-2007		646.21		2097.92		26.14		53.85
1-2-2007		1532.24		1342.11		66.71		53.54
2-2-2007		990.62		903.81		60.93		53.46
3-2-2007		1057.14		990.15		65.41		54.17
4-2-2007		1438.83		1246.81		64.97		53.93
5-2-2007		1099.61		996.28		63.98		53.76
6-2-2007		1126.97		1063.28		65.30		54.53
7-2-2007		1265.68		1112.82		63.53		53.83
8-2-2007		1004.30		946.74		63.69		54.01
9-2-2007		1030.72		973.64		64.82		54.37
10-2-2007		1002.89		945.80		64.18		54.16
11-2-2007		1374.66		943.91		64.07		53.92
12-2-2007		1224.16		1079.79		63.53		53.95
13-2-2007		1431.75		1225.10		64.84		54.40
14-2-2007		1255.77		1099.61		64.14		54.33
15-2-2007		1036.86		963.73		63.69		54.16
16-2-2007		1033.55		977.88		64.67		54.61
17-2-2007		1001.47		941.55		64.30		54.19
18-2-2007		1281.72		1137.82		63.72		54.03
19-2-2007		1235.96		1087.81		63.46		53.98
20-2-2007		998.64		943.91		63.46		54.01
21-2-2007		1028.37		971.75		64.48		54.52
22-2-2007		1299.65		1228.41		65.06		54.43
23-2-2007		1169.43		1109.99		65.78		54.84
24-2-2007		912.77		923.15		64.63		54.03
25-2-2007		1139.71		1085.92		65.07		54.55
26-2-2007		1000.53		941.55		63.25		53.82

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
27-2-2007		1035.91		992.04		64.49		54.39
28-2-2007		1336.45		1182.64		64.36		54.03
1-3-2007		1184.53		1132.16		65.48		54.82
2-3-2007		1072.24		1023.17		64.37		54.42
3-3-2007		1077.43		1030.25		64.90		54.61
4-3-2007		1226.99		1169.43		65.68		54.76
5-3-2007		1120.84		1071.30		65.06		54.64
6-3-2007		1411.93		1323.71		64.80		54.27
7-3-2007		1015.15		981.19		63.83		53.91
8-3-2007		1076.02		1021.29		64.65		54.43
9-3-2007		1314.75		1183.58		63.36		53.92
10-3-2007		1291.63		1153.86		62.88		53.85
11-3-2007		1090.64		1010.91		63.17		53.93
12-3-2007		1063.28		1001.94		63.40		54.04
13-3-2007		1143.01		1079.32		64.67		54.50
14-3-2007		1115.17		1056.20		64.70		54.48
15-3-2007		1068.94		1012.32		64.04		54.36
16-3-2007		1107.15		1014.21		63.08		53.90
17-3-2007		1311.44		1172.73		63.92		54.00
18-3-2007		1357.21		1224.63		64.81		54.24
19-3-2007		1068.94		1017.99		63.96		54.34
20-3-2007		984.49		978.35		63.94		53.81
21-3-2007		1168.49		1077.43		64.18		54.12
22-3-2007		1296.82		1159.05		64.13		54.07
23-3-2007		1308.61		1182.64		64.71		54.24
24-3-2007		1042.52		989.21		63.81		54.05
25-3-2007		1056.67		1006.66		64.66		54.46
26-3-2007		1060.92		973.64		64.19		54.09
27-3-2007		1024.12		968.45		64.17		54.17
28-3-2007		1294.46		1168.02		63.96		54.05
29-3-2007		1289.74		1143.48		64.08		53.93
30-3-2007		1218.03		1148.67		65.56		54.73
31-3-2007		1465.72		1284.55		65.11		54.22
1-4-2007		1283.13		1142.54		64.32		53.97
2-4-2007		1075.07		1020.34		65.17		54.63
3-4-2007		1291.63		1141.12		64.49		54.18
4-4-2007		1065.16		998.17		65.03		54.65
5-4-2007		1039.22		972.69		65.14		54.74
6-4-2007		1264.26		1097.72		63.66		54.02
7-4-2007		1284.08		1196.32		65.45		54.47
8-4-2007		1024.12		965.14		64.20		54.43
9-4-2007		1035.44		980.71		64.51		54.57
10-4-2007		1386.46		1194.44		64.26		54.16
11-4-2007		1094.42		910.89		64.03		53.96
12-4-2007		1004.78		945.80		63.59		54.11
13-4-2007		1084.51		1026.48		65.05		54.67
14-4-2007		1171.32		1034.03		63.84		54.13
15-4-2007		1310.50		1164.71		64.51		54.24
16-4-2007		1282.66		1142.07		64.45		54.18
17-4-2007		1282.66		1142.07		64.45		54.18

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
18-4-2007		1256.24		1122.72		64.46		54.07
19-4-2007		1281.72		1145.37		64.78		54.14
20-4-2007		1026.478		966.088		64.905		54.383
21-4-2007		1018.457		943.913		64.436		54.073
22-4-2007		1465.719		1265.205		64.858		54.097
23-4-2007		1279.831		1126.970		64.490		53.965
24-4-2007		1129.801		1013.268		63.995		54.050
25-4-2007		1016.569		959.482		64.610		54.310
26-4-2007		1277.473		1121.779		63.794		53.957
27-4-2007		1372.774		1188.304		64.579		54.132
28-4-2007		1346.354		1185.473		65.052		54.073
29-4-2007		1364.283		1268.509		65.369		54.275
30-4-2007		1195.381		1122.724		65.625		54.584
1-5-2007		1285.493		1144.426		64.401		54.298
2-5-2007		1270.396		1117.534		64.394		54.252
3-5-2007		1258.130		1122.724		64.634		54.205
4-5-2007		1009.021		957.124		63.600		54.019
5-5-2007		1024.118		973.637		64.626		54.310
6-5-2007		1033.554		983.072		63.879		54.174
7-5-2007		1134.047		1079.318		65.350		54.693
8-5-2007		1228.878		1091.586		63.550		54.046
9-5-2007		1101.021		1036.386		65.361		54.716
10-5-2007		1097.246		1041.104		64.854		54.534
11-5-2007		1282.191		1140.652		63.933		54.135
12-5-2007		1052.898		80.526		43.780		49.633
13-5-2007		861.350		1043.462		54.031		54.457
14-5-2007		1064.221		914.661		54.248		57.794
15-5-2007		1205.760		1126.498		54.395		66.228
16-5-2007		1072.713		922.682		54.132		61.916
17-5-2007		1210.006		1151.031		54.461		66.345
18-5-2007		1143.954		1011.852		54.534		66.577
19-5-2007		1051.483		926.929		54.089		64.688
20-5-2007		1049.595		914.662		54.050		67.440
21-5-2007		1177.923		1063.749		54.437		66.867
22-5-2007		1179.340		1066.580		54.565		66.914
23-5-2007		1174.621		1062.334		54.430		66.794
24-5-2007		1171.319		1051.955		54.449		66.828
25-5-2007		1168.487		1058.560		54.182		66.538
26-5-2007		1175.093		1074.129		54.364		66.681
27-5-2007		1183.113		1084.980		54.708		66.960
28-5-2007		1172.263		1057.615		54.507		66.782
29-5-2007		1171.319		1061.862		54.565		66.859
30-5-2007		1173.678		1060.919		54.306		66.623
31-5-2007		1176.036		1064.692		54.530		66.852
1-6-2007		1044.878		915.134		54.252		66.875
2-6-2007		1050.538		917.493		54.012		61.301
3-6-2007		1075.545		930.231		54.224		63.221
4-6-2007		1177.452		1055.257		54.333		65.613
5-6-2007		1091.586		956.181		54.356		64.463
6-6-2007		1102.437		974.108		54.414		64.154

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
7-6-2007		1347.299		1251.523		55.452		68.694
8-6-2007		1176.036		1050.538		54.747		65.756
9-6-2007		1086.867		952.405		54.565		64.630
10-6-2007		1043.463		912.303		52.815		62.985
11-6-2007		1038.744		913.246		52.610		65.667
12-6-2007		1036.857		903.339		52.765		60.178
13-6-2007		1142.067		1034.498		53.059		67.173
14-6-2007		1146.786		1040.631		53.098		67.177
15-6-2007		1151.503		1047.236		53.082		67.154
16-6-2007		1081.677		1001.472		50.257		66.991
17-6-2007		1094.416		1006.662		50.319		67.053
18-6-2007		990.621		919.380		49.885		67.034
19-6-2007		1030.252		908.057		52.320		66.991
20-6-2007		995.811		902.867		49.467		64.874
21-6-2007		1149.145		1018.456		50.032		67.010
22-6-2007		1148.201		1041.103		52.587		66.906
23-6-2007		1146.786		1042.047		52.436		66.848
24-6-2007		1136.405		1025.062		52.297		66.844
25-6-2007		1134.519		1025.062		52.177		66.836
26-6-2007		1137.349		1049.123		52.246		66.828
27-6-2007		1150.560		1040.159		52.184		66.801
28-6-2007		1144.426		1032.139		52.266		66.945
29-6-2007		1145.841		1034.970		52.320		66.952
30-6-2007		1144.426		1036.857		52.359		66.949
1-7-2007		1136.405		1035.441		52.401		67.049
2-7-2007		1144.897		1046.293		52.378		67.026
3-7-2007		1020.345		909.473		52.103		66.364
4-7-2007		1139.709		1038.272		52.343		66.949
5-7-2007		1136.877		1032.139		52.242		66.976
6-7-2007		1136.877		1041.574		52.316		66.983
7-7-2007		1045.350		941.083		53.090		66.902
8-7-2007		1155.278		1039.216		53.353		66.875
9-7-2007		1156.222		1054.785		53.338		66.871
10-7-2007		1148.673		1048.651		53.396		66.770
11-7-2007		1160.938		1052.427		53.357		66.484
12-7-2007		1148.673		1048.180		53.350		66.383
13-7-2007		1154.334		1043.462		53.381		66.461
14-7-2007		1145.842		1048.180		53.350		66.488
15-7-2007		1153.390		1053.370		53.330		66.236
16-7-2007		1155.278		1049.595		53.202		66.000
17-7-2007		1161.410		1050.539		53.311		65.903
18-7-2007		1143.011		1036.386		53.183		65.679
19-7-2007		1144.426		1036.857		53.168		65.474
20-7-2007		1034.025		1009.021		52.699		64.788
21-7-2007		1141.596		1039.688		53.024		65.176
22-7-2007		1145.841		1044.878		52.757		64.943
23-7-2007		1132.160		1027.421		52.591		64.916
24-7-2007		1138.293		1037.801		50.106		65.114
25-7-2007		1127.913		1025.062		51.406		65.361
26-7-2007		1028.837		861.821		51.073		65.079

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
27-7-2007		1079.790		956.652		52.823		63.066
28-7-2007		1079.790		956.652		52.823		63.066
29-7-2007		1265.678		1201.985		53.067		65.776
30-7-2007		1099.134		997.698		52.405		63.035
31-7-2007		1136.405		1037.801		53.005		64.146
1-8-2007		1217.555		1136.405		52.990		64.835
2-8-2007		1076.017		956.180		52.444		63.828
3-8-2007		1275.586		1216.140		49.738		64.034
4-8-2007		1026.005		914.190		50.915		56.446
5-8-2007		1325.124		1253.411		51.805		66.499
6-8-2007		1039.216		1032.610		51.116		65.779
7-8-2007		1217.082		1168.487		51.538		65.985
8-8-2007		1172.734		1086.867		51.561		61.796
9-8-2007		1027.894		905.226		51.778		54.553
10-8-2007		1026.478		922.210		51.724		61.804
11-8-2007		1183.113		1097.719		52.061		62.388
12-8-2007		1069.411		964.201		51.766		63.074
13-8-2007		1134.990		1007.605		52.072		65.822
14-8-2007		1024.118		896.733		51.762		57.314
15-8-2007		1176.036		1045.821		52.393		67.142
16-8-2007		1313.802		1372.775		52.138		66.445
17-8-2007		1027.421		902.396		51.828		57.743
18-8-2007		1393.534		1349.186		53.059		67.777
19-8-2007		1215.667		1094.888		53.172		65.791
20-8-2007		1048.651		925.042		53.338		59.826
21-8-2007		387.194		1494.970		33.739		36.979
22-8-2007		1218.026		1153.390		51.476		65.992
23-8-2007		1036.386		914.662		52.169		61.498
24-8-2007		1024.590		881.636		51.774		63.705
25-8-2007		1140.652		1018.457		53.284		65.435
26-8-2007		1146.786		1059.031		53.261		60.306
27-8-2007		1038.744		918.908		53.253		66.360
28-8-2007		1079.318		953.349		53.493		64.316
29-8-2007		1072.713		937.308		53.381		63.004
30-8-2007		1257.657		1243.976		53.717		65.299
31-8-2007		1093.473		964.200		53.470		63.174
1-9-2007		1092.529		965.145		53.284		62.752
2-9-2007		1048.180		922.682		53.024		57.855
3-9-2007		1164.714		1032.610		53.373		65.195
4-9-2007		1051.011		1023.175		52.935		66.139
5-9-2007		1071.298		954.292		52.990		56.787
6-9-2007		1043.934		914.190		52.835		59.621
7-9-2007		1153.861		1061.862		53.125		59.458
8-9-2007		1047.708		923.626		53.071		59.423
9-9-2007		1043.462		918.437		53.090		60.221
10-9-2007		1045.821		924.098		53.059		58.564
11-9-2007		1045.821		925.042		52.966		58.347
12-9-2007		1036.386		983.544		52.893		66.496
13-9-2007		1364.755		1308.610		53.535		66.821
14-9-2007		1080.733		963.729		53.067		59.385

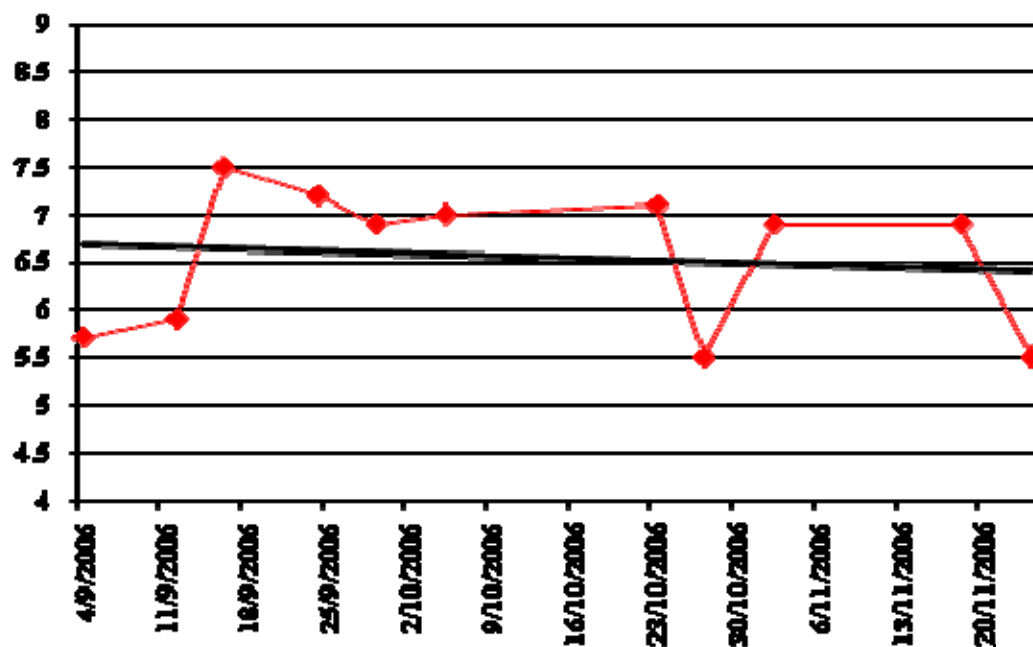
	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
15-9-2007		1108.570		991.093		53.144		62.752
16-9-2007		1198.683		1143.482		53.249		66.050
17-9-2007		1312.857		1229.821		53.694		66.639
18-9-2007		1034.498		944.856		52.850		65.706
19-9-2007		1044.878		922.210		52.955		58.963
20-9-2007		1129.800		1006.190		53.319		64.463
21-9-2007		1236.898		1135.462		53.330		65.361
22-9-2007		1095.831		980.714		53.129		62.172
23-9-2007		1176.979		1070.826		53.113		63.952
24-9-2007		1271.811		1214.252		53.307		65.841
25-9-2007		1168.016		1088.754		53.032		60.635
26-9-2007		1035.442		899.564		52.804		60.437
27-9-2007		1078.847		958.067		53.094		62.675
28-9-2007		1080.733		970.333		53.179		62.748
29-9-2007		1062.806		949.575		53.435		61.932
30-9-2007		1143.954		1046.293		53.477		64.425
1-10-2007		1146.786		1038.744		53.396		64.285
2-10-2007		1159.052		1058.088		53.357		64.115
3-10-2007		1150.088		1051.483		53.280		63.991
4-10-2007		1141.124		1042.990		53.292		63.906
5-10-2007		1150.560		1054.785		53.280		63.701
6-10-2007		1153.862		1063.277		53.233		63.643
7-10-2007		1155.278		1068.939		53.326		63.596
8-10-2007		1151.503		1051.482		53.381		63.546
9-10-2007		1160.467		1042.990		53.245		63.244
10-10-2007		1156.222		1039.216		53.055		63.267
11-10-2007		1134.519		1028.837		52.962		62.996
12-10-2007		1146.786		1044.406		53.040		62.954
13-10-2007		1137.350		1023.175		53.017		62.748
14-10-2007		1144.426		1034.970		52.281		62.830
15-10-2007		1027.894		898.148		51.863		63.031
16-10-2007		1152.446		1051.954		52.359		63.465
17-10-2007		1137.349		1034.026		52.297		63.859
18-10-2007		1131.688		1024.590		52.482		64.188
19-10-2007		1135.462		1032.139		52.653		64.529
20-10-2007		1138.765		1042.990		52.401		64.471
21-10-2007		1134.519		1036.857		52.409		64.622
22-10-2007		1132.632		1040.631		52.378		64.699
23-10-2007		1026.005		873.615		51.983		62.795
24-10-2007		1134.519		1028.365		52.432		64.924
25-10-2007		1151.503		1049.595		52.448		65.063
26-10-2007		1149.145		1051.954		52.390		65.098
27-10-2007		1137.349		1032.139		52.235		65.059
28-10-2007		1136.405		1033.082		52.424		65.272
29-10-2007		1139.709		1040.631		52.378		65.168
30-10-2007		1139.237		1035.442		52.293		65.280
31-10-2007		1155.278		1054.785		52.990		65.311
1-11-2007		1151.503		1047.708		53.156		65.280
2-11-2007		1153.861		1057.615		52.885		65.315
3-11-2007		1142.539		1040.159		53.040		65.539

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
4-11-2007		1075.073		963.257		52.517		51.828
5-11-2007		1090.169		950.047		52.924		64.270
6-11-2007		1264.733		1204.816		53.473		66.198
7-11-2007		1034.025		885.883		52.061		60.294
8-11-2007		1167.544		1040.631		53.172		65.361
9-11-2007		1105.267		974.580		52.784		64.014
10-11-2007		1263.791		1269.924		53.094		64.657
11-11-2007		1272.754		1165.186		53.214		66.116
12-11-2007		1052.427		924.570		53.415		58.583
13-11-2007		1203.401		1095.831		53.446		66.132
14-11-2007		1052.427		925.985		53.199		58.730
15-11-2007		1222.272		1104.795		53.729		65.536
16-11-2007		1053.370		924.098		53.222		59.547
17-11-2007		1118.006		992.508		53.450		64.320
18-11-2007		1239.729		1159.523		53.706		65.857
19-11-2007		1220.386		1103.380		53.528		65.679
20-11-2007		1044.878		1067.996		53.431		65.381
21-11-2007		1087.811		952.877		53.609		63.596
22-11-2007		1337.863		1244.919		54.294		66.747
23-11-2007		1053.842		924.570		53.427		57.368
24-11-2007		1111.872		974.580		53.775		64.463
25-11-2007		1281.719		1154.334		54.414		66.348
26-11-2007		1052.427		864.180		52.901		57.457
27-11-2007		1083.094		827.379		53.152		63.325
28-11-2007		1369.001		1265.678		53.079		62.578
29-11-2007		1038.272		11963.171		52.982		43.773
30-11-2007		1044.406		907.585		53.141		49.188
1-12-2007		1042.046		1111.400		53.152		67.336
2-12-2007		1282.663		1193.965		53.648		66.685
3-12-2007		1322.766		0.000		53.768		66.352
4-12-2007		1050.538		909.473		53.202		58.785
5-12-2007		1229.821		1128.856		53.373		64.959
6-12-2007		1051.955		912.774		53.609		55.916
7-12-2007		1080.733		933.534		53.613		62.896
8-12-2007		1050.066		880.221		53.601		61.486
9-12-2007		1057.144		917.021		53.659		59.230
10-12-2007		1107.155		964.673		53.950		63.952
11-12-2007		1248.692		1147.729		54.221		66.225
12-12-2007		1059.504		913.718		53.752		61.517
13-12-2007		1248.221		1144.426		54.379		66.124
14-12-2007		1079.790		934.006		53.934		62.733
15-12-2007		1203.401		1093.473		54.155		60.585
16-12-2007		1209.533		1104.323		54.259		64.386
17-12-2007		1148.673		1018.929		54.116		63.058
18-12-2007		1200.098		1086.396		54.286		63.453
19-12-2007		1052.427		911.359		53.895		57.728
20-12-2007		1351.072		1275.586		54.395		66.047
21-12-2007		1069.411		934.949		53.973		58.634
22-12-2007		1055.729		916.077		53.926		58.006
23-12-2007		1050.538		970.333		53.779		64.583

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
24-12-2007		1309.083		1248.692		54.542		65.203
25-12-2007		1214.724		1110.457		54.228		60.484
26-12-2007		1071.770		930.230		53.926		62.253
27-12-2007		1117.534		980.714		54.221		62.973
28-12-2007		1064.692		923.626		53.961		61.970
29-12-2007		1135.462		1013.268		54.008		61.905
30-12-2007		1306.253		1227.463		54.488		64.788
31-12-2007		1152.918		1022.703		54.166		63.747
1-1-2008		1160.467		1037.329		54.174		63.794
2-1-2008		1166.601		1049.123		54.255		63.720
3-1-2008		1165.186		1045.821		54.283		63.631
4-1-2008		1159.052		1038.744		54.298		63.573
5-1-2008		1175.093		1053.370		54.286		63.453
6-1-2008		1172.263		1050.538		54.294		63.341
7-1-2008		1168.016		1049.123		54.321		63.356
8-1-2008		1166.129		1050.539		54.399		63.395
9-1-2008		1168.016		1048.180		54.441		63.383
10-1-2008		1159.995		1037.329		54.395		63.213
11-1-2008		1183.113		1051.955		54.379		63.136
12-1-2008		1168.487		1051.011		54.341		63.128
13-1-2008		1187.360		1086.867		54.395		63.035
14-1-2008		1210.006		1105.267		54.418		62.996
15-1-2008		1131.217		1033.554		54.530		62.981
16-1-2008		1143.954		1041.103		54.530		62.868
17-1-2008		1128.856		1040.159		54.492		62.876
18-1-2008		1141.124		1060.447		54.511		62.845
19-1-2008		1149.616		1042.519		54.472		62.768
20-1-2008		1176.979		1084.980		54.321		62.559
21-1-2008		1159.523		1052.427		54.430		62.795
22-1-2008		1131.217		1032.139		54.379		62.845
23-1-2008		1144.897		1036.857		54.515		63.376
24-1-2008		1171.791		1057.144		54.499		63.596
25-1-2008		1124.611		1010.437		54.271		63.515
26-1-2008		1141.124		1023.175		54.182		63.476
27-1-2008		1161.883		1052.898		54.232		64.010
28-1-2008		1030.252		887.298		51.898		46.881
29-1-2008		1058.560		913.718		52.049		50.017
30-1-2008		1081.678		958.067		52.115		51.538
31-1-2008		1149.145		1029.309		52.479		66.995
1-2-2008		1143.954		1024.118		52.405		64.816
2-2-2008		1145.369		1029.780		52.347		64.715
3-2-2008		1141.124		1028.365		52.324		64.684
4-2-2008		1159.052		1041.574		52.506		64.870
5-2-2008		1050.538		934.949		52.846		65.021
6-2-2008		1157.637		1052.427		53.806		64.939
7-2-2008		1155.750		1048.180		53.907		65.087
8-2-2008		1159.523		1048.651		53.803		65.048
9-2-2008		1162.827		1046.293		53.888		65.164
10-2-2008		1169.902		1053.370		53.868		65.210
11-2-2008		1161.410		1044.878		53.822		65.172

	Pressure Header #2		Pressure Header #1		Temperature Header #2		Temperature Header #1	
	PT-0901A-1	PV_IND	PT-0901B-1	PV_IND	TT-0901A-1	PV_IND	TT-0901B-1	PV_IND
12-2-2008		1160.467		1039.688		53.787		65.207
13-2-2008		1172.734		1046.293		53.779		65.222
14-2-2008		1169.431		1044.406		53.787		65.195
15-2-2008		1166.129		1035.914		53.772		65.238
16-2-2008		1172.263		1039.216		53.876		65.354
17-2-2008		1171.319		1043.462		53.826		65.381
18-2-2008		1170.848		1038.744		53.791		65.350
19-2-2008		1171.319		1040.159		53.946		65.497
20-2-2008		1168.016		1035.442		54.027		65.598
21-2-2008		1068.468		917.965		54.252		43.300
22-2-2008		1141.596		995.811		54.677		63.569
23-2-2008		1048.180		917.021		53.911		53.144
24-2-2008		1031.667		904.754		54.081		61.231
25-2-2008		1085.924		976.467		54.205		60.132

Appendix C. Salema F pH measurements period September – November 2006



Bibliographic Information

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