

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 03-06-049-18w5m

Date: May 22, 2015

SAP Equipment ID: 66129837

VESSEL STATIC DATA						
Plant	Minehead Comp Stn	Op Unit	System			
Prov. Insp. #	A0561919	CRN	T6804.2	Equip Tag # n/a		
Equipment Description				Flare Knockout		
Manufacturer				Pyramid Corp.		
Internal Access:				Description: 24" manway		
MAWP	100	PSI	@	500	°F	MDMT
CODE :				RT : 2		PWHT : No
Diameter	48in	Length	(S/S) 120 in	OAL	in	Horizontal
Shell	Mat'l	Thickness	0.375	in	Corr Allowance	0.125 in
Head	Mat'l	Thickness	0.3125	in	Corr Allowance	0.125 in
Nozzle	Mat'l	Thickness			mm / in	Corr Allowance
Internal Coating:		Internal Clad :			Capacity	
Manway :		YES			Inspection Port : NO	
Nozzle Rating		300	lb ANSI	Painted :		YES
				Insulated		YES

PROCESS DATA			
Product Description	Gas	Sweet	
Operating Pressure	0	PSI	Operating Temperature °F

PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM	Manufacturer	Model / Type	Service Date / Company

PSV DETAILS			
	Type (Thread/Flange)	ANSI Rating	Size (inches)
PRD Inlet			
PRD Outlet			

NDE Equipment Records					
Procedure#	Description	Manufacturer	Model#	Serial#	Due Date

INSPECTION SUMMARY

Across road from main Minehead comp site. Visual inspection performed during site turnaround, site not in operation at time of inspection. Vessel and piping insulated and clad, limiting visual access to steel surface to side and btm shell in shack only. Insulation in good condition, Coverplates present on all UT port cutouts. Exposed vessel shell / paint in good external condition. Vessel and piping well supported and secure. Dataplate secure and legible. Vessel open to atmosphere via outlet piping to flare stack. No PSV found or required. UT corrosion survey conducted by Streamline May 2015.

RECOMMENDATIONS

Vent regulator outside to prevent gas release in shack.
 Double nut manway davit.

NONCONFORMANCES / INSPECTION DEFICIENCIES

Regulator off of 2" line to top shell vents into shack.
 Manway davit is single nut only

INSPECTION PLANNING

Inspection Strategy	_____	Availability	_____	Inspection Interval	_____
Inspection Date	May 22, 2015	Date of Last Inspect	_____	Date of Next Inspect	_____

REPORT CERTIFICATION

The signatures below certify that inspections/tests have been completed in accordance with the identified inspection strategy and that the specified equipment is considered fit for service until the date of next inspection.

Inspected by	Ed Tymensen		Date	May 22, 2015
Company	Streamline Inspection Ltd	PESL #	000711	API #
Reviewed and Approved by	_____	Date	_____	_____

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 03-06-049-18w5m

Date: May 22, 2015

SAP Equipment ID: 66129837

	_____	PESL #	_____	API #	_____
Criticality Assessment Rerun	_____	Inspection Planning Rerun	_____		
Assessed Next Inspection Date					

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 03-06-049-18w5m

Date: May 22, 2015

SAP Equipment ID: 66129837

DETAILED INSPECTION VISUAL EXTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	Good			Overall no significant concerns observed
V2	General Corrosion	N/A			No corrosion concerns noted Visual limited to exposed side and btm shell
V3	General Leaks	N/A			No active leaks present
V4	Vibration	N/A			
V5	Dissimilar Flange Rating	N/A			None noted
V6	Ladder/Stairway	N/A			
V7	Heads	N/A			Insulated, no visual access
V8	Guy Wires	N/A			
V9	Electrical Ground	Good			Securely grounded Ground cable connected to skid
V10	Painted Inactive Corrosion	N/A			
V11	Coating/Painting	Good			No significant failures observed Visual limited to exposed side and btm shell
V12	Expansion Joint or Bellows	N/A			
V13	Gauge/Site Glass	Good	Level		Clear and legible
V14	Shell	Good			No concerns noted Visual limited to exposed side and btm shell
V15	Jacket	N/A			
V21	Support Other (Please explain)	Good	piping		well supported
V22	Foundation	Good			No concerns noted steel skid on steel piles
V23	Anchor Bolts	Good			Securely in place
V24	Saddle/Skirt	Good	Saddle		Securely in place Saddle connection to shell insulated
V25	Davit	Good			Securely in place single nut only
V26	Fireproofing	N/A			
V31	Connections Other (Please explain)	Good			all threaded connections appear secure
V32	Small Branches	N/A			
V33	Nozzles	Good			No stresses, corrosion or misalignment
V34	Manways	Good			
V35	Reinforcing Pads	N/A			
V36	Inadequate Thread Engagement	Good			None noted
V37	Bolting	Good			Intact with no missing bolts or short bolting
V38	Flanges	Good			No active leaks
V39	Leak Clamps	N/A			
V41	Insulation Other (Please explain)	Good	Vessel and piping		Insulated and clad
V42	Damage	N/A			None noted
V43	Penetrations	Good			All penetrations sealed
V44	Insulation Jacket	Good	Vessel and piping		No concerns tin clad
V45	Banding	Good	Piping		No concerns
V46	Seals/Joints	Good			All seals intact
V51	Relief Devices Other (Please explain)	N/A			No PSV found or required, open to atmosphere via outlet piping to flare stack
V52	Corrosion	N/A			
V53	Leaks	N/A			
V54	Restricted Inlet/Outlet	N/A			
V55	Manual Operation Lever	N/A			

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 03-06-049-18w5m

Date: May 22, 2015

SAP Equipment ID: 66129837

PHOTOS



LSD SIGN



INSPECTION STICKER



DATAPLATE



VESSEL OVERVIEW







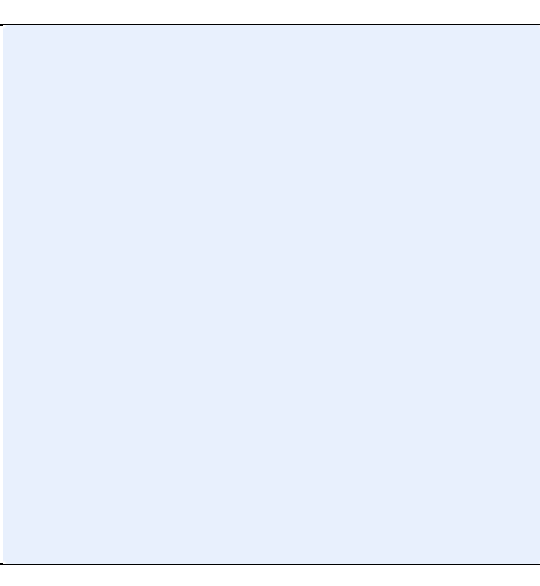
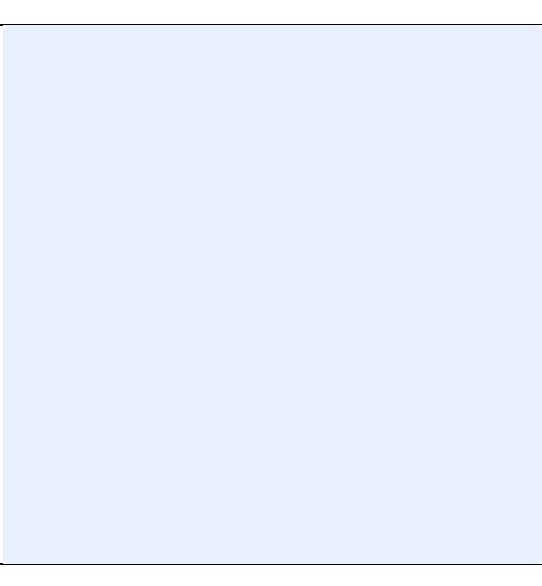
VESSEL OVERVIEW



MANWAY

PRESSURE VESSEL & COLUMN INSPECTION REPORT

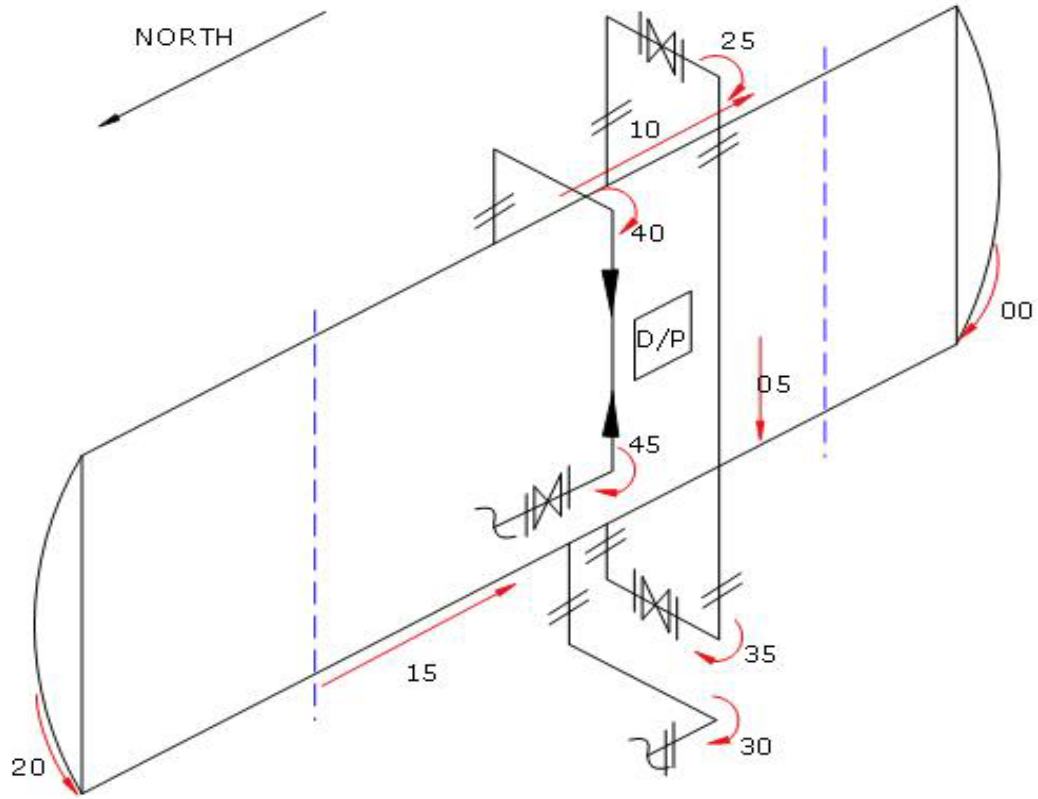
LSD: 03-06-049-18w5m Date: May 22, 2015 SAP Equipment ID: 66129837

	
<p>DAVIT IS SINGLE NUT ONLY</p>	<p>REGULATOR VENTS INTO SIDE SHACK - RECOMMEND VENTING OUTSIDE</p>
	
	

Husky Energy

Location Name:	MINEHEAD	LSD:	03-06-49-18 W5M	
A#:	A0561919	Equipment/Tag No.		
Equipment Description:	FLARE KNOCK OUT DRUM			
Manufacturer:	PYRAMID			
Serial Number:	06-2653-0001	CRN:	T6804.2	
Shell MAWP:	100	PSI	Shell Design Temp:	500 °F
Tube MAWP:		PSI	Tube Design Temp:	°F
Shell Material:	SA-516-70N			
Shell Thickness:	9.53	mm	Head Thickness:	7.94 mm
Corrosion Allowance:	3.1750	mm	Date Built:	2006
Size:	1219	mm	Pipe / Rolled Plate:	PLATE
RT:	2			
NOTES:	SAP66129837			







Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: May 22, 2015

Inspector: D. Skeard

LSD: 03-06-49-18 W5M	Area: MINEHEAD	Location: PLANT
A #: A0561919	Tag Number:	Vessel Name: FLARE KNOCK OUT DRUM
CRN: T6804.2	Year Built: 2006	Serial Number: 06-2653-0001
RT: 2	Vessel CA: 3.175 mm	Manufacturer: PYRAMID
	Shell MAWP: 100 PSI	Tube MAWP: PSI
	MAWTF: 500 °F	MAWTF: °F
		Pipe/Plate PLATE

TML Description	Baseline	Material: SA-516-70N
00 HEAD	2015	Flag CA Nominal T Min
Shape: Ellipsoidal	Min 9.19	4.765 3.175 7.940
OD: 1219.2	Avg 9.32	STCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:	LTCR mm/yr 0.000
		Remaining Life:
		Retirement Date:

TML Description	Baseline	Material: SA-516-70N
05 SHELL	2015	Flag CA Nominal T Min
Shape: Cylindrical	Min 9.55	6.350 3.175 9.525
OD: 1219.2	Avg 9.63	STCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:	LTCR mm/yr 0.000
		Remaining Life:
		Retirement Date:

TML Description	Baseline	Material: SA-516-70N
10 SHELL	2015	Flag CA Nominal T Min
Shape: Cylindrical	Min 9.50	6.350 3.175 9.525
OD: 1219.2	Avg 9.55	STCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:	LTCR mm/yr 0.003
		Remaining Life:
		Retirement Date:

TML Description	Baseline	Material: SA-516-70N
15 SHELL	2015	Flag CA Nominal T Min
Shape: Cylindrical	Min 9.14	6.350 3.175 9.525
OD: 1219.2	Avg 9.30	STCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments:	LTCR mm/yr 0.042
		Remaining Life:
		Retirement Date:



Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: May 22, 2015

Inspector: D. Skeard

LSD: 03-06-49-18 W5M	Area: MINEHEAD	Location: PLANT
A #: A0561919	Tag Number:	Vessel Name: FLARE KNOCK OUT DRUM
CRN: T6804.2	Year Built: 2006	Serial Number: 06-2653-0001
RT: 2	Vessel CA: 3.175 mm	Manufacturer: PYRAMID
	Shell MAWP: 100 PSI	Tube MAWP: PSI
	MAWTF: 500 °F	MAWTF: °F
		Pipe/Plate PLATE

TML Description	Baseline	Material: SA-516-70N
20 HEAD	2015	Flag CA Nominal T Min
Shape: Ellipsoidal	Min 4.72	4.765 3.175 7.940 3.023
OD: 1219.2	Avg 4.78	STCR mm/yr 0.000
Spec: ASME VIII Div.1	Comments: Low Reading Found	LTCR mm/yr 0.357
		Remaining Life: 4.95 Yrs
		Retirement Date: 5/2/2020

TML Description	Baseline	Material: A-234-WPB
25 PIPING	2015	Flag CA Nominal T Min
Shape: 90° Elbow	Min 7.52	4.512 0.645 5.156
OD: 73.025	Avg 7.77	STCR mm/yr 0.000
Spec: ASME B31.3	Comments: LOW READING	LTCR mm/yr 0.000
		Remaining Life:
		Retirement Date:

TML Description	Baseline	Material: A-234-WPB
30 PIPING	2015	Flag CA Nominal T Min
Shape: 90° Elbow	Min 4.62	6.668 0.953 7.620 2.540
OD: 88.9	Avg 4.75	STCR mm/yr 0.000
Spec: ASME B31.3	Comments: Low Reading Found	LTCR mm/yr 0.333
		Remaining Life: 6.51 Yrs
		Retirement Date: 11/22/2021

TML Description	Baseline	Material: A-234-WPB
35 PIPING	2015	Flag CA Nominal T Min
Shape: 90° Elbow	Min 5.03	4.512 0.645 5.156
OD: 73.025	Avg 5.46	STCR mm/yr 0.000
Spec: ASME B31.3	Comments: LOW READING	LTCR mm/yr 0.014
		Remaining Life:
		Retirement Date:



Ultrasonic Corrosion Survey

*All values are in millimeters unless otherwise stated.

Survey Name: Husky Energy

Date: May 22, 2015

Inspector: D. Skeard

LSD: 03-06-49-18 W5M	Area: MINEHEAD	Location: PLANT
A #: A0561919	Tag Number:	Vessel Name: FLARE KNOCK OUT DRUM
CRN: T6804.2	Year Built: 2006	Serial Number: 06-2653-0001
RT: 2	Vessel CA: 3.175 mm	Manufacturer: PYRAMID
	Shell MAWP: 100 PSI	Tube MAWP: PSI
	MAWTF: 500 °F	MAWTF: °F
		Pipe/Plate PLATE

TML Description	Baseline	Material: A-234-WPB						
40 PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape: 90° Elbow	Min	4.845	0.692	5.537		0.000	0.076	
OD: 60.325	Avg	5.11				Remaining Life:		
Spec: ASME B31.3	Comments:					Retirement Date:		

TML Description	Baseline	Material: A-234-WPB						
45 PIPING	2015	Flag	CA	Nominal	T Min	STCR mm/yr	LTCR mm/yr	
Shape: 90° Elbow	Min	4.845	0.692	5.537		0.000	0.615	
OD: 60.325	Avg					Remaining Life:		
Spec: ASME B31.3	Comments:					Retirement Date:		

ALBERTA MUNICIPAL AFFAIRS

ABSA, the pressure equipment safety authority
 200, 4208 - 97 Street
 Edmonton AB T6E 5Z9
 Partial/ Partiel

A# 561919
 Aug 10/06
 MFB

**MANUFACTURER'S DATA REPORT
 FOR PRESSURE VESSEL
 DÉCLARATION DE CONFORMITÉ DU CONSTRUCTEUR
 D'APPAREILS SOUS PRESSION**

Upon shipment of a pressure vessel, this form fully and correctly filled in must be mailed to the office of the Chief Inspector in the province of installation in accordance with the regulations under the Act, governing the construction and installation of pressure vessels.

Au moment de l'expédition d'un appareil sous pression, ce formulaire complété correctement, doit être envoyé au bureau de l'inspecteur en chef de la province d'installation tel que prévu dans les règlements de la loi sur les appareils sous pression.

Manufactured by Construit par	Name and address of Manufacturer/ Nom et adresse du constructeur Pyramid Corporation, 2308-8 Street, Nisku, Alberta, T9E 7Z2
Manufactured for Construit pour	Name and address of Purchaser or Consignee/ Nom et adresse du client ou de son représentant Husky Oil Operations c/o Tartan Engineering
Ultimate owner Utilisateur	Name and address/ Nom et adresse Husky Oil Operations 707 8th Street, SW, Calgary, Alberta T2P-3G7
Location of installation Lieu d'installation	Address/ Adresse L.S.D.: 03-06-49-18 W5M

Pressure vessel/ Appareil

Type/ Genre HORIZONTAL FLARE KNOCK OUT DRUM	Overall Length/Longueur totale 10' 0" center of seam to center of seam	Serial No./ N° de série D-06-2653-0001-001 Rev.2	Year built/Année de fabrication 2006
Provincial Registration No. - C.R.N./N° d'enregistrement provincial - N.E.C. T6804.2		National Board No./ N° National Board	Drawing No./ N° de dessin D-06-2618-0000-001 Rev.3

The chemical and physical properties of all parts meet the requirements of material specifications of the A.S.M.E. Code.

Les propriétés chimiques et physiques de toutes les composantes respectent les exigences des spécifications de matériaux de code ASME.

The design, construction and workmanship conform to CSA B51. La conception, la construction et la façon sont conformes à ACNOR B51.	ASME Section VIII	Division DIV I	Addenda/Supplément 2004 ED 2005 Add	Code case No. N° de cas
--	----------------------	-------------------	--	----------------------------

Manufacturer's partial data reports properly identified and signed by authorized inspectors have been furnished for the following items of the report, and attached to this report:

Les rapports partiels du constructeur adéquatement identifiés et signés par les inspecteurs autorisés ont été produits pour les items suivants du rapport, et attachés à ce rapport:

Names of parts/ Nom de la composante	Item No./ N° d'item	Manufacturer's Name/ Nom du constructeur	Identifying Stamp/ Estampe d'identification

Shell/ Virole

Description	Material Matériau	Thickness Épaisseur	Corr. Allow. Surépais. de corr.	Diameter Diamètre	Longitudinal Joints Joints longitudinaux			P.W.H.T. Traitement therm		Girth Joints Joints de circonférence		Number of courses Nombre de sections
					Type	R.T. Radiog.	Efficiency Efficacité	Temp.	Time Durée	Type	R.T. Radiog.	
Shell	SA-516-70N	.375"	.125	48" ID	1	full	1.0	N/A	N/A	1	Spot per UW 11(a) 5(b)	1

Heads/ Tetes

Description	Material Matériau	Min. Thickn. Épais minim.	Corr. Allow Surép. Corr.	Crown. Radius Rayon couron.	Knuckle Radius Petit rayon	Ellipse Ratio Rapp. ellipse	Conical Apex Angle Angle conique	Hemisph. Radius Ray. Hémisph	Flat Diameter Diam.plat	Side to pressure Côte sous pression
Head	SA-516-70N	.3125"	.125			2:1				concave
Head	SA-516-70N	.3125"	.125			2:1				concave

Removable bolts used (describe other fastenings) Boulons amovible utilisés (décrire tout autre attache)	Mat'l Spec./ Spéc. du mat.	Grade	Size/ Dimension
--	----------------------------	-------	-----------------

Pressure - Temperature/ Pression - température

Pressure Vessel Part Partie de l'appareil	Constructed for max. allowable working pressure Construit pour une pression maximale de marche permise	At max. temp. A une temp. max.	Min. Temp. (when less than -29°C) Temp. min. (inférieure à -29°C)	Test pressure (hydro-pneumatic or combination) Pression d'épreuve (hydro-pneumatique ou combinaison)
Vessel	100 Psi	500 Degrees F.	-50 Degrees F.	130 Psig

Tube Section/ Faisceau tubulaire

① 561919

Tubesheet/ Plaque tubulaire	Material/ Matériau	Diameter/ Diamètre	Nominal Thickness Épaisseur nominale	Corr. Allow. Surépais. corrosion	Attachment Mode d'attachement
Tube material/ Matériau des tubes	Diameter/ Diamètre	Nominal Thickness (gauge) Épaisseur nominale (calibre)	Number/ Nbre	Type (Straight or U) Type (Droit ou U)	Heating Surface Surface de chauffe

Jacket/ Chemise

Type of jacket/ Genre de chemise	Jacket closure Fermeture de chemise	Proof Test Pression d'épreuve	Heating Surface Surface de chauffe	Sketch/ Schéma
----------------------------------	--	----------------------------------	---------------------------------------	----------------

Safety Valve Outlets/ Soupapes de sûreté

Number/ Nombre	Dimension	Location/ Endroit
----------------	-----------	-------------------

Nozzles and Openings/ Tubulures et ouvertures

Purpose/ But	Number Nombre	Dimension	Type	Material Matériau	Nominal Thickness Épaisseur nominale	Reinforcement material Matériau de renfort	How attached Genre d'attaches	Location/ Endroit
N1/N2	2	6"	CL 150 RFWN	SA-350-LF2	.436		UW16a	shell
N3/N8	2	4"	CL 150 RFWN	SA-350-LF2	.337		UW16a	shell
N4A/4B	2	2"	CL 150 RFWN	SA-350-LF2	.344		UW16a	shell
N5	1	3"	CL 150 RFWN	SA-350-LF2	.300		UW16a	shell
N6/N7	2	2"	CL 150 RFWN	SA-350-LF2	.344		UW16a	shell
M1	1	24"	CL 150 RFWN	SA-350-LF2 CI-1	.375	SA-516-70N**	UW16a	Head

Supports/ Supports

Skirt/ Jupe Yes/ Oui No/ Non <input type="checkbox"/> <input checked="" type="checkbox"/>	Lugs/ Oreilles No./ Nbre 2	Legs/ Pieds No./ Nbre	Other/ Autres (Description) Saddle	Attached/ Attaches (Where and How/ Méthode et endroit) Shell
---	----------------------------------	--------------------------	--	---

Remarks/ Observations (Cubical capacity/ Volume)

- 1) Refer to Dwg D-06-2618-0000-001 Rev.3 Reg # T6804.2
- 2) Volume = 146.61 cubic feet
- 3) Impact test exempt on shell and heads per UCS-66(a)
- 4) Impact test exempt on nozzels and flanges per UCS-66(g)

Certificate of Compliance/ Certificat de conformité

We certify that the statements made in this data report are correct and that the said vessel has been constructed in accordance with the Provincial Registered design below and the requirements of standard CSA B51.

Nous certifions que les données de la déclaration de conformité sont correctes et que l'appareil a été construit en accord avec l'enregistrement provincial ci-dessous et les exigences de la norme ACNOR B51.

Provincial Registered Design
Enregistrement provincial T6804.2

Manufacturer
Constructeur Pyramid (Corporation) Process Fabricators

Signature [Signature] Date August 10/2006

Certificate of Shop Inspection/ Certificat d'inspection en usine

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by ABSA

of/ de Alberta
have inspected the above vessel and state that to the best of my knowledge and belief, the manufacturer has constructed the vessel in accordance with the Provincial registration CRN T6804.2 and the requirements of standard CSA B51.
ai inspecté l'appareil précité et autant que je sache, crois que le constructeur a construit l'appareil en accord avec l'enregistrement provincial NEC _____ et les exigences de la norme ACNOR B51.

Inspector's Name
Nom de l'inspecteur Mark Hillier 243 A
Signature [Signature] Date Aug 14/06

Certificate of Compliance - Field Work/ Certificat de conformité - Installation au chantier

We certify that the field installation of all parts of the vessel conforms with the requirements of Provincial Regulations.

Nous certifions que l'installation au chantier de toutes les composantes de l'appareil est conforme aux règlements provinciaux.

Installer's Name
Nom de l'installateur _____

Signature _____
Date _____

Certificate of Field Inspection/ Certificat d'inspection - Installation au chantier

I, the undersigned, a duly authorized Boiler and Pressure Vessel Inspector
Je, soussigné, inspecteur autorisé de chaudières et appareil sous pression
employed by _____

have inspected the items not covered by the Shop Inspection Certificate and the installation of the items and state that to the best of my knowledge and belief the construction and assembly of the items are in accordance with the Provincial Regulations.

ai inspecté les composantes non couvertes par le certificat d'inspection en usine et l'installation de l'appareil et, autant que je sache, la construction et l'assemblage de l'appareil sont en accord avec les règlements provinciaux.

Inspector's Name
Nom de l'inspecteur _____
Signature _____ Date _____