

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 07-27-051-19W5M

Date: JULY 10, 2014

SAP Equipment ID: 66043907

VESSEL STATIC DATA						
Plant		Ansell Gas Plant		Op Unit		System
Prov. Insp. #		A2741026		CRN		K-5165.2
Equipment Description		Inlet Gas Particle Filter		Serial #		91-6019-0
Manufacturer		Wells-Hall Fabrication		Vessel Class		
Internal Access: Yes		Description: 16" top flanged head		Year Built		1991
MAWP 5102		KPA @ 38 °C		MDMT		-29 °C
CODE : U		RT : 1		PWHT : yes		
Diameter 16 in		Length (s/s) 52.75 in		OAL mm / in		Vertical
Shell Mat'l		Thickness		0.656 in		Corr Allowance in
Head Mat'l		Thickness		0.602 in		Corr Allowance in
Nozzle Mat'l		Thickness				Corr Allowance mm
Internal Coating: YES—NO		Internal Clad : YES—NO		Capacity		m3
Manway : yes		Inspection Port : no		Skirt		
Nozzle Rating 300 lb ANSI		Painted : yes		Insulated		no
PROCESS DATA						
Product Description Gas				Sweet		
Operating Pressure PSI				Operating Temperature °F		
PSV STATIC DATA						
Serial No.	Location	Set Pressure	Capacity SCFM / Lbs/Hr / GPM	Manufacturer	Model / Type	Service Date / Company
C07-24958	Off inlet separator V-102	486psi	18060scfm	Crosby	JBSE35J	12-Sep-11. Wizard. PSV-1002
PSV DETAILS						
	Type (Thread/Flange)	ANSI Rating		Size (in)		
PRD Inlet	Flanged	600		3"		
PRD Outlet	Flanged			4"		
NDE Equipment records						
Procedure#	Description	Manufacturer	Model#	Serial#	Due Date	

INSPECTION SUMMARY

Barcode # 002898

A visual external inspection was conducted on vessel. In plant 1 stabilizer building. Plant 1 down at time of inspection. Dataplate secure and legible. Vessel and piping are in good condition, piping well supported. No significant paint deterioration found. Vessel skirt securely welded to skid floor. Inspection port present in skirt. Ground cable securely attached to skid. Top flanged head davit has a single nut only. PSV service up to date, set below MAWP, vents to flare header. There is a valve on piping between filter and inlet separator V-102 (and PSV). The valve handle is removed but is not "locked open". UT inspection performed 2014 by Streamline Inspection.

Vessel was found to be in good condition and fit for continued service.

RECOMMENDATIONS

Ensure all valves between filter and the protecting PSV off V-102 are "locked" in the open position.
Review UT survey results.
Consider double nutting davit.

NONCONFORMANCES / INSPECTION DEFICIENCIES

There is a valve on piping between filter and inlet separator V-102 (and PSV). The valve handle is removed but is not "locked open"

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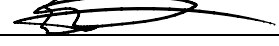
SAP Equipment ID: 66043907

INSPECTION PLANNING

Inspection Strategy	Availability	Inspection Interval
Inspection Date July 10, 2014	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	July 10, 2014
Company	Streamline Inspection	PESL #	000711	API # 27479
Reviewed and Approved by			Date	
		PESL #		API #
Criticality Assessment Rerun		Inspection Planning Rerun		
Assessed Next Inspection Date				

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 07-27-051-19W5M

Date: JULY 10, 2014

SAP Equipment ID: 66043907

DETAILED INSPECTION VISUAL EXTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	Good			Overall
V2	General Corrosion	n/a			No corrosion noted
V3	General Leaks	n/a			No leaks noted
V4	Vibration	n/a			
V5	Dissimilar Flange Rating	Good			Similar ratings
V6	Ladder/Stairway	n/a			
V7	Heads	Good			No corrosion or damage noted. Top head is flanged
V8	Guy Wires	n/a			
V9	Electrical Ground	Good	Attached to skid		Ground cable present and secure
V10	Painted Inactive Corrosion	n/a			
V11	Coating/Painting	Good			No deterioration noted
V12	Expansion Joint or Bellows	n/a			
V13	Gauge/Site Glass	Good	psi		Gauges clear and legible
V14	Shell	Good			No corrosion or damage noted
V15	Jacket	n/a			
V21	Support Other (Please explain)	Good	Piping		Well supported
V22	Foundation	Good			Vessel on steel skid.
V23	Anchor Bolts	n/a			
V24	Saddle/Skirt	Good	Skirt		Welded to skid, inspection port present
V25	Davit	n/a			
V26	Fireproofing	n/a			
V31	Connections Other (Please explain)	Good			All connections appear secure
V32	Small Branches	Good	Tubing		No leaks or kinks
V33	Nozzles	Good			No corrosion or damage
V34	Manways	n/a			
V35	Reinforcing Pads	n/a			
V36	Inadequate Thread Engagement	Good			Adequate engagement
V37	Bolting	Good			All bolting tight and secure, no corrosion of threads
V38	Flanges	Good			No leaks or corrosion
V39	Leak Clamps	n/a			
V41	Insulation Other (Please explain)	n/a			
V42	Damage	n/a			
V43	Penetrations	n/a			
V44	Insulation Jacket	n/a			
V45	Banding	n/a			
V46	Seals/Joints	n/a			
V51	Relief Devices Other (Please explain)	Good	Inlet separator V-102		Service up to date, set below MAWP
V52	Corrosion	n/a			None noted
V53	Leaks	n/a			None noted
V54	Restricted Inlet/Outlet	n/a			
V55	Manual Operation Lever	Poor			Valve between filter and PSV off inlet sep. has handle removed but is not "locked" open

PRESSURE VESSEL & COLUMN INSPECTION REPORT

LSD: 07-27-051-19W5M

Date: JULY 10, 2014

SAP Equipment ID: 66043907

DETAILED INSPECTION VISUAL INTERNAL

ID	Description	Condition	Location	NCR	Comments
V1	General Other (Please Explain)	n/a			
V2	Corrosion (depth, length, width)	n/a			
V3	Erosion	n/a			
V4	Distortion	n/a			
V5	Blisters	n/a			
V6	Deposits	n/a			
V7	Heads	n/a			
V8	Welds	n/a			
V9	Nozzles	n/a			
V10	Shell	n/a			
V11	Gasket Surfaces	n/a			
V21	Internals Other (Please explain)	n/a			
V22	Demister	n/a			
V23	Baffle/Wier	n/a			
V24	Sparger	n/a			
V25	Thermowells	n/a			
V26	Metallic Linings	n/a			
V27	Nonmetallic Linings	n/a			
V28	Trays	n/a			
V29	Tray Rings	n/a			
V30	Other Welded Attachments	n/a			

DETAILED INSPECTION OTHER TECHNIQUES

ID	Location	Observation/Measurement	Acceptance Criteria	NCR	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

DETAILED INSPECTION UT THICKNESS

CML	Nom. Thk	Current Reading	Short Term Corr Rate	Long Term Corr Rate	Remaining Life	Comments

PRESSURE VESSEL & COLUMN INSPECTION REPORT

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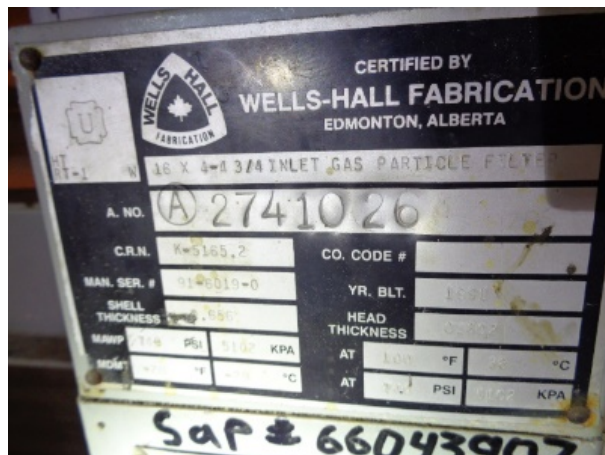
Date: JULY 10, 2014

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PHOTOS



LSD sign



DATAPLATE



DATAPLATE



VESSEL OVERVIEW



DAVIT SINGLE NUT ONLY



UNLOCKED OPEN VALVE BETWEEN FILTER AND UPSTREAM PSV
OFF OF INLET SEP.

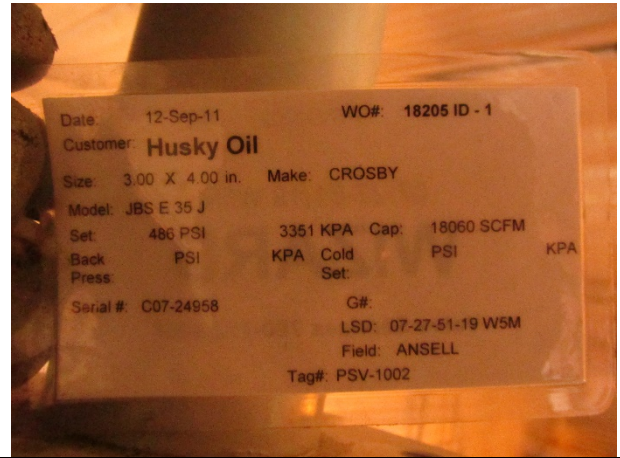
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PHOTOS



PSV service tag



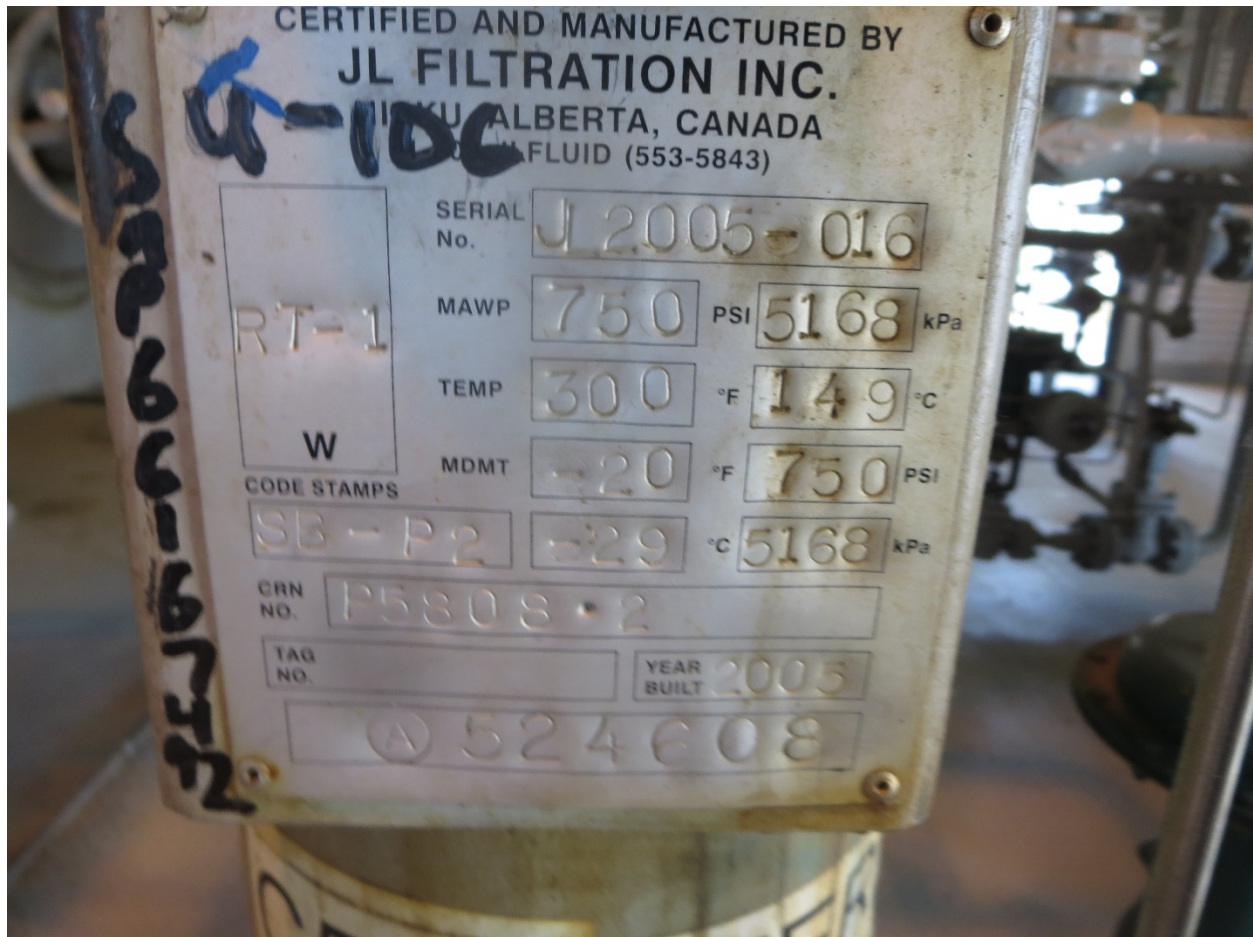
PSV overview

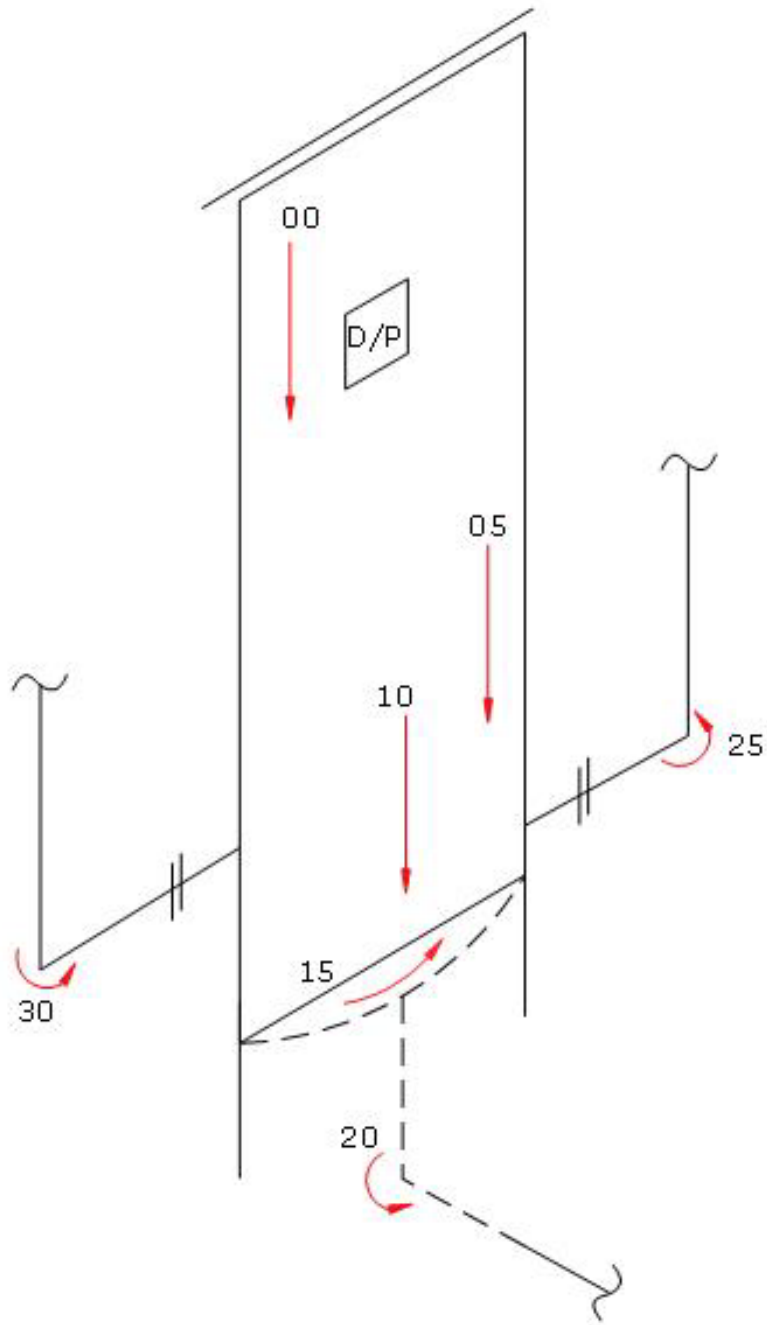


PSV Dataplate

Location Name:	ANSELL GAS PLANT	LSD:	07-27-051-19W5
A#:	A2741026	Equipment/Tag No.	U-105
Equipment Description:	GAS PARTICLE FILTER	Serial Number:	91-6019-0
		CRN: (or other ID#)	K5165.2
MAWP:	740 PSI	Design Temp:	100°F
Shell Material:	SA-106-B	Head Material:	SA-105-N
Shell Thickness:	0.656"	Head Thickness:	0.602"
Corrosion Allowance:	0.125"	Date Built:	1991
Size:	16"	Manufacturer:	WELLS-HALL FABRICATION

Notes: **CML 30 EROSION NOTED.**







Ultrasonic Corrosion Survey

Survey Name: Husky Energy

Date: Jul 11, 2014

Inspector: C. Graham

LSD:	07-27-051-19W5	Area:	Ansell	Location:	Gas Plant
A #:	A2741026	Tag Number:	U-105	Vessel Name:	Gas Particle Filter
CRN:	K5165.2	Year Built:	1991	Serial Number:	91-6019-0
		Vessel CA:	3.175 mm	Manufacturer:	Wells-Hall Fabrication
		Shell MAWP:	740psi	Tube MAWP:	MAWTF:
			MAWTF:	100°F	

TML Description		Baseline				Material:	SA-106-B
00	Shell	2014	Flag	CA	Nominal	T Min	Corr. Rate
Shape:	Cylindrical	Min	16.890	13.487	3.175	16.662	
OD:	16"	Avg	17.070				Remaining Life:
Spec:	ASME VIII Div.1	Comments:					Retirement Date:

TML Description		Baseline				Material: SA-106-B	
05	Shell	2014	Flag	CA	Nominal	T Min	Corr. Rate
Shape:	Cylindrical	Min	16.610	13.487	3.175	16.662	
OD:	16"	Avg	16.810				Remaining Life:
Spec:	ASME VIII Div.1	Comments:					Retirement Date:

TML Description		Baseline				Material: SA-106-B	
10	Shell	2014	Flag	CA	Nominal	T Min	Corr. Rate
Shape:	Cylindrical	Min	16.380	13.487	3.175	16.662	
OD:	16"	Avg	16.840				Remaining Life:
Spec:	ASME VIII Div.1	Comments:					Retirement Date:

TML Description		Baseline				Material: SA-105-N	
15	Head	2014	Flag	CA	Nominal	T Min	Corr. Rate
Shape:	Ellipsoidal	Min	15.420	12.116	3.175	15.291	
OD:	16"	Avg	15.620				Remaining Life:
Spec:	ASME VIII Div.1	Comments:					Retirement Date:



Ultrasonic Corrosion Survey

Survey Name: Husky Energy

Date: Jul 11, 2014

Inspector: C. Graham

LSD: 07-27-051-19W5 Area: Ansell Location: Gas Plant
A #: A2741026 Tag Number: U-105 Vessel Name: Gas Particle Filter
CRN: K5165.2 Year Built: 1991 Serial Number: 91-6019-0
Vessel CA: 3.175 mm Manufacturer: Wells-Hall Fabrication
Shell MAWP: 740psi MAWTF: 100°F Tube MAWP: MAWTF:

TML Description	Baseline	Material:	A-234-WPB
20 Nozzle	2014	Flag	CA
Shape: 90° Elbow	Min 9.020	Nominal 9.093	T Min
OD: 1.315"	Avg 9.400	Assumed	Corr. Rate
Spec: ASME VIII Div.1	Comments:	Remaining Life:	Retirement Date:

TML Description	Baseline	Material:	A-234-WPB
25 Piping	2014	Flag	CA
Shape: 90° Elbow	Min 7.260	Nominal 7.112	T Min
OD: 6.625"	Avg 7.620		Corr. Rate
Spec: ASME B31.3	Comments:	Remaining Life:	Retirement Date:

TML Description	Baseline	Material:	A-234-WPB
30 Piping	2014	Flag	CA
Shape: 90° Elbow	Min 6.270	Nominal 7.112	T Min
OD: 6.625"	Avg 6.990		Corr. Rate
Spec: ASME B31.3	Comments: Erosion Noted	Remaining Life:	Retirement Date:

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

*CORRECTED COPY

② 274 102 6
N.S.A.F. 100
APR 22/75

1. Manufactured and certified by WELLS-HALL FABRICATION & CONSTRUCTION LTD. (Name and address of manufacturer)
2. Manufactured for PALL PROCESS FILTRATION CO. / PENELOPE RESOURCES LTD. (Name and address of purchaser)
3. Location of Installation TURNER VALLEY GAS PLANT, A.B. (Name and address)
4. Type VERTICAL 11-6019-0 K-SIGES 44-A-6019-0 (Name, Bd. No.) (Year built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1. Year 1989

- to WINTER '90, ADDENDUM 2
6. Shell: SA-106-GR.B 0.656" 0.125" 1'-2 1/16" 4'-4 3/4" 8
7. Seams: SEAMLESS N/A 100% 1150° 1 hr 32 min EQUIV. 2H 3HT FULL CNE
8. Heads: (a) Matl. SA-105N (Spec. No., Grade) (b) Matl. SA-516-70 (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	16"	ANSI	300"	BLIND					
(b)	BOTTOM	0.602"	0.125"			2:1				CONCAVE

- If removable, bolts used (describe other fastenings) 14" BUN-2B, SA-194 GR. 2M / 14" BUN-2A, SA-193 GR. B7M
9. MAWP 740 psi at max. temp. 100 °F
Min. design metal temp. -20 °F at 740 psi. Hydro., pneu., or comb. test pressure 1110 psi.

10. Nozzles, Inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Matl.	Nom. Thk.	Reinforcement Matl.	How Attached	Location
INLET	1	6"	R.F.W.N.	SA-106-GR.B	SCH. 160	—	WELDED	—
OUTLET	1	6"	R.F.W.N.	SA-106-GR.B	SCH. 160	—	WELDED	SHELL
DRAIN	2	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	—	WELDED	—
DIFF. PRESS. CONN.	2	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	—	WELDED	—
VENT	1	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	—	WELDED	—
FILTER ACCESS	1	16"	R.F.W.N.	SA-105N	SCH. 60	—	WELDED	SHELL

11. Supports: Skirt YES Lugs ONE Legs — Other — Attached WELDED TO SHELL (BOTH)
12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: NO IMPACT TESTING REQUIRED PER UCS-66 & UCS-68C * M.D.M.T. CORRECTED FROM 100°F TO -20°F.

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1, "U" Certificate of Authorization No. 14595, expires JULY 31, 1993.
Date AUG 29, 91 Co. name WELLS-HALL FAB. & CONST. LTD. Signed Bob Jangou

CERTIFICATE OF SHOP INSPECTION

Vessel constructed by WELLS-HALL FABRICATION & CONSTRUCTION LTD. at EDMONTON, A.B.
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by THE GOVERNMENT OF ALBERTA,
have inspected the component described in this Manufacturer's Data Report on August 26, 1991, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date 9/10/91 Signed [Signature] Commissions ALBERTA

FORM U-1 * MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
(Alternative Form for Single Chamber, Completely Shop-Fabricated Vessels Only)
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

① 2741026
N.S.A.F. PER

1. Manufactured and certified by WELLS-HALL FABRICATION & CONSTRUCTION LTD. (Name and address of manufacturer)
2. Manufactured for TURNER VALVE & PLANT LTD. (Name and address of purchaser)
3. Location of Installation TURNER VALVE & PLANT LTD. (Name and address)
4. Type VERTICAL 11-6011-0 K-5165.3 44-A-6011-0 (Ident. or cert. tank) (Mfg's serial No.) (ICRNI) (Drawing No.)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section VIII, Division 1.

6. Shell: SA-106-GR.B 0.656" 1.125" 1'-2 1/16" 4'-4 3/4" 75 (Mat. (Spec. No., Grade)) (Nom. T.R. (in.)) (Corr. Allow. (in.)) (Diam. I.D. (ft. & in.)) (Length (overall) (ft. & in.))
7. Seams: SEAMLESS N/A 100% 1150° 1 hr 32 min. EQUIV. D1 BUTT FULL CNE (Long. (Welded, Dbl., Sngl., Lap, Butt)) (R.T. (Spot or Full)) (Eff. (%) (H.T. Temp. (°F)) (Time (hr)) (Girth (Welded, Dbl., Sngl., Lap, Butt)) (R.T. (Spot, Partial, or Full)) (No. of Courses)
8. Heads: (a) Matl. SA-105N (Spec. No., Grade) (b) Matl. SA-516-70 (Spec. No., Grade)

	Location (Top, Bottom, Ends)	Minimum Thickness	Corrosion Allowance	Crown Radius	Knuckle Radius	Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure (Convex or Concave)
(a)	TOP	16"	ANSI	300"	BLIND					CONCAVE
(b)	BOTTOM	0.602"	0.125"			2:1				

If removable, bolts used (describe other fastenings) 14" BUN-2B SA-193 GR.87M / 14" BUN-2A SA-193 GR.87M (Matl., Spec. No., Gr., Size, No.)
9. MAWP 100 psi at max. temp. 100 °F
Min. design metal temp. 100 °F
psi Hydro, pneu., or comb. test pressure 110 psi.

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Nom. Thk.	Reinforcement Matl.	How Attached	Location
INLET	1	6"	R.F.W.N.	SA-106-GR.B	SCH. 160	WELDED	—
OUTLET	1	6"	R.F.W.N.	SA-106-GR.B	SCH. 160	WELDED	SHELL
DRAIN	2	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	WELDED	—
DIFF. PRESS. COUPL.	2	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	WELDED	—
VENT	1	1"	R.F.W.N.	SA-106-GR.B	SCH. XXH	WELDED	—
FILTER ACCESS	1	16"	R.F.W.N.	SA-105N	SCH. 60	WELDED	SHELL

11. Supports: Skirt YES Lugs ONE Legs — Other — Attached WELDED TO SHELL (BOTH) (Where and how)
12. Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report: 16" O.D. X 4'-4 3/4" 75 X 740" D.P. + 3 C.H. INLET GAS PARTICLE FILTER VOL: 6.01473 WT: 1400 lbs. NO IMPACT TESTING REQUIRED PER UCS-66 & UCS-68(C)

CERTIFICATE OF SHOP COMPLIANCE
We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1. "U" Certificate of Authorization No. 19595 expires JULY 31, 1993.
Date AUG 26, 91 Co. name WELLS-HALL FAB. & CONST. LTD. Signed Bob Zang (Manufacturer) (Representative)
CERTIFICATE OF SHOP INSPECTION
Vessel constructed by WELLS-HALL FABRICATION & CONSTRUCTION LTD. at EDMONTON, AB.
I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of ALBERTA and employed by THE GOVERNMENT OF ALBERTA,
have inspected the component described in this Manufacturer's Data Report on Original 26, 91, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date 9/10/91 Signed [Signature] (Authorized Inspector) Commissions ALBERTA (Nat'l Board (incl. endorsements), State, Prov. and No.)