



the pressure equipment safety authority

C&P UNIT # 91013

AB-31-2006-04

Mail Form to:
ABSA
9410 - 20th Avenue
Edmonton, AB
Canada T6N 0A4

Design Registration Application

CS Job # CS065249

Date of Application: Aug 1st, 06

Please fill out a separate form for each design/procedure you wish to register.

Note: Two sets of drawings (folded) and one set of calculations are required to be submitted.

☐ New submission ☐ Resubmission (Ref. Tracking No.: _____) ☐ Revision CRN ☒ Repair or Alteration CRN: <u>K-3964.2</u> A# <u>2722205</u>	FOR ABSA OFFICE USE ONLY: Tracking No. _____ Date Received _____ Design Surveyor Assigned _____ Anticipated Response Date _____
A Manufacturer's Company Name (Plant Owner for Piping Submission): <u>COMPRESSION SERVICES</u> Mailing Address: <u>5049 - 74 Avenue S.E.</u> <u>Calgary, Alberta</u> <u>T2C - 3H2</u> Contact Person: <u>Hon Liu</u> Phone Number: <u>(403) 720 - 1603</u> Fax Number: <u>(403) 720 - 3765</u> E-Mail Address: <u>hon.liu@enerflex.com</u>	B Submitted by (If other than shown in A) Company Name: _____ Mailing Address: _____ Contact Person: _____ Phone Number: _____ Fax Number: _____ E-Mail Address: _____
Main Drawing No(s). (or Fittings Catalogue No.) <u>A-VIII30 Rev. 1</u> Design currently registered under CRN <u>K-3964.2</u> (Ensure that proof of this registration is attached.) Description/Type of Boiler/Pressure Vessel/Fitting/Piping: <u>14" DIA. STG 1 DISCHARGE BOTTLE</u> Date Registration is required: <u>Aug 16, 2006</u> Rush Rate Authorized ☒ Approved By: <u>[Signature]</u>	
Category of design/procedure: ☒ Vessel/Boiler Code of Construction Sect <u>VIII</u> Div <u>1</u> ☐ Piping (Form AB-96 attached) ☐ Fitting (Form AB-41/Statutory Declaration, with original signatures must be attached) ☐ Repair or Alteration ☐ Welding Procedure ☐ Other (specify) _____	(Invoicing Instructions) Invoice to be sent to: ☒ A ☐ B ☐ Other (specify below) Return drawings to: ☒ A ☐ B ☐ Other (specify below) Company Name: _____ Mailing Address: _____ P.O. # or Reference No. _____

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

1. Manufactured and certified by Enerflex Systems Ltd. Compression Services 5049 74 Avenue S.E. CALGARY, AB T2C 3H2
(Name and address of Manufacturer)
2. Manufactured for Husky Energy Inc. c/o Tarten Engineering 700,110-12 Avenue S.W. Calgary AB. T2R 0G7
(Name and address of Purchaser)
3. Location of installation Ansell AB. LSD: 7-7-51-10 W5M
(Name and address)

4. Type Horizontal Stage One Discharge Bottle 065249-03 T8296.2 VE065249C Rev.1 -- 2006
(Horiz. or vert. tank) (Mfr's serial No.) (CRN) (Drawing no.) (Nat'l 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 2004
Year

to 2005 -- --
Addenda (Date) Code Case Nos. Special Service per UG 120(d)

6. Shell: SA-106-B .500" .0625" 1' 1" 6' 3"
Mat'l. (Spec. No., Grade) Nom. Thk. (in.) Corr. Allow. (in.) Diam. I.D. (ft. & in.) Length (overall) (ft. & in.)

7. Seams: SMLS N/A 100 N/A N/A TYPE 1 Spot* 70 1
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, or Full) Eff (%) No. of Courses

8. Heads: (a) Mat'l. SA-516-70N (b) Mat'l. SA-516-70N
(Spec No., Grade) (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)	End	.500"	0.0625"	--	--	2:1	--	--	--	CONCAVE
(b)	End	.500"	0.0625"	--	--	2:1	--	--	--	CONCAVE

If removable, bolts used (describe other fastenings) --

(Mat'l., Spec. No., Gr., Size, No.)

9. MAWP 655 N/A psi at max. temp. 300 N/A °F
(internal) (external) (internal) (external)

Min. design metal temp. -20 °F at 655 psi. Hydro., pneu., or comb. Test pressure HYDRO AT 852 psi.

10. Nozzles, inspection and safety valve openings:

Purpose (Inlet, Outlet, Drain)	No.	Diam. or Size	Type	Mat'l.	Nom. Thk.	Reinforcement Mat'l.	How Attached	Location
Inlet / Inspection	1	6"	RFWN CL900	SA105N SA106-B	.432"	SA516-70N	UW16.1(C)	Shell
Outlet	1	4"	RFWN CL300	SA105N SA106-B	.531"		UW16.1(C)	Head
TI	1	3/4"	TOL	SA105N	CL6000		UW16.1(A)	Shell
TSH	1	3/4"	TOL	SA105N	CL6000		UW16.1(A)	Shell
PT	1	3/4"	TOL	SA105N	CL6000		UW16.1(A)	Shell
Inspection	1	1 1/2"	TOL	SA105N	CL3000		UW16.1(A)	Head
Drain	1	3/4"	TOL	SA105N	CL6000		UW16.1(A)	Shell
--	--	--			--			
--	--	--			--			
--	--	--			--			

11. Supports: Skirt No Lugs N/A Legs N/A Other N/A Attached N/A
(Yes or No) (No.) (No.) (Describe) (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 this report: NONE

(Name of part, item number, Mfr's name and identifying stamp)

SERVICE Sweet GAS PSV ON PIPE AS PER UG-125
CONST. DRAWING NO.: VE065249C Rev.1 RADIOGRAPHY: *Spot Per UW11(a) 5 (b)
TESTING: No Charpy Impact Test Required Per UG-20(f) 1 Through 5 CUBIC CAPACITY: 4.7 CUBIC FEET

CERTIFICATE OF SHOP/FIELD 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. 35011 expires MARCH 15, 2008.
Date DECEMBER 5, 2012 Co. name Enerflex Systems Ltd., Compression Services Signed (Representative)
(Manufacturer)

CERTIFICATE OF SHOP/FIELD INSPECTION

Vessel constructed by Enerflex Systems Ltd., Compression Services at CALGARY, ALBERTA, CANADA.
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of ALBERTA and employed by ABSA have inspected the component described in this Manufacturer's Data Report on 20, 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 2012 Signed (Authorized Inspector) Commissions ALBERTA (Nat'l Board. (incl. endorsements) State, Prov. and No.)



BOILERS AND PRESSURE VESSELS REPAIR AND ALTERATION REPORT

(A) #: **2722188**OWNER EQUIP NO.: **CS065249**REPAIR ☐

and/or

ALTERATION ☒Partial ☐ Final ☒

1. **Name and Address of Organization** doing Repair/Alteration Enerflex Systems Ltd. Compression Services
5049 74 Avenue S.E. Calgary AB. T2C 3H2 AQP No. & Expiry Date 1359(S) March 15/08
Location of Installation Ansell AB. LSD: 7-7-51-10 W5M
2. **Name of Owner** Husky Energy Inc. c/o Tarten Engineering
Address 700, 110 - 12 Avenue S.W. Calgary AB. T2R 0G6
3. **Boiler/Pressure Vessel Description** Stage One Suction Bottle CRN K3963.2
Manufacturer's Name Enerflex Systems Ltd. Serial No. 91013-03
4. **Design Conditions:**
a) Vessel/Shellside/Boiler: Max Allowable Working Press. _____ Min/Max Design Temp _____ / _____
b) Jacket/Tubeside: Max Allowable Working Press. _____ Min/Max Design Temp _____ / _____
5. **Description of defects** (location and types of deterioration that resulted in the repair/alteration). Altered to meet customer requirements.
6. **ASME Code Edition and Addenda** used for work: ASME Sect. VIII Year 2004 Addenda 2005
7. **Repair/Alter. Description of Work.** Step by step description of repair/alteration method, attach additional sheets as needed.

Note 1: Repair/Alteration Procedure to be accepted by ABSA SCO prior to start of work.

UT thickness band scanning and MPI inspection to ABSA #114 guideline. See attached report.

Cut existing 8" CL400 Flange off only on N2 connection and replace with a new 8"x 6" conc. reducer & 6" CL900 RFWN flange. A new name plate bracket was added to shell. Bottle hydro tested to 983 PSIG.

8. **Material** - List any material used in repair/alteration and any base material welded on:

Item	Mat'l Spec.	Thick/Sch	Diam	Item	Mat'l Spec.	Thick/Sch	Diam
Shell/Drum				Heads/ Ends			
Tubeshe				Tubes			
Nozzles	SA106-B SA234WPB	.500"	8"	Flanges/Fitting	SA105N SA234WPB .432	Class 900	6"

9. **Welding Procedure** - Alberta Registration Number WP- 807.2 WPS Numbers used: ESL 101, 103
10. **Heat Treatment:** Bake Out (Temp./Time) _____ / _____ hr Preheat Temp _____ Post Weld HT (Temp./Time) _____ / _____
11. **Non Destructive Examination** (Specify type and extent).
UT and MPI to ABSA #114 guideline.

(A) #: 2722188**OWNER EQUIP. NO.** CS065249**12. Pressure Test**

Vessel/Boiler/Shellside

Tubeside/Jacket

a) Hydrostatic 983 PSIG

b) Other Test

- 13. Welded Replacement Parts:** Attached are Manufacturer's Partial Data Reports or Repair/Alteration Reports properly identified and signed by Authorized Inspectors for the following items of this report: (Welded parts supplied by others).

- 14. Responsibility Owner/Client.** Identify below items that the owner/client has assumed responsibility for. **Note (2)**

a) Design Submission _____ b) Repair/Alteration Procedure: _____ c) Material Control _____

d) Welding Control _____ e) NDE _____ f) Heat Treatment _____ g) Pressure Test _____

Note 2: Owner/client must have a valid Alberta Quality Program (AQP), for the scope of work, to assume responsibility for function c, d, e, f, or g.

15 REMARKS:**16. CERTIFICATE OF COMPLIANCE**

We certify that the statements made in this Report are correct and that all design, material, construction and workmanship on this repair/alteration conform to the requirements of the Alberta Safety Codes Act and Regulations.

a) For all items except for items identified in 14:
Enerflex Systems Ltd. Compression Services

(Repair/Alteration Organization Name)

1359(S)

March 15/06

(AQP Number & Expiry Date)

(Signature & Date)

(Print Name)

b) For items identified in 14 only:

(Owner/Client Organization Name)

(AQP Number & Expiry Date)

(Signature & Date)

(Print Name)

- 17. DATE WORK WAS COMPLETED:** _____

18. CERTIFICATE OF INSPECTION

I have inspected the repairs and/or alterations described in this report. To the best of my knowledge this work has been done in accordance with the Safety Codes Act and Regulations.

a) Owner-User Inspection Certification (Field Only)
(Required when Owner-User Inspects the work under their ABSA Authorized Owner-User Quality Program).

b) ABSA Safety Codes Officer Certification
(when work is inspected by ABSA).

Owner-User AQP# & Expiry Date

Owner User In-Service Inspector Signature & Date

Owner-User In-Service Inspector Name (Please Print)

Owner-User In-Service Inspector Alberta Cert #

ABSA SCO Signature & Date

Print Name

Report Received by ABSA SCO

Date



BOILERS AND PRESSURE VESSELS REPAIR AND ALTERATION REPORT

(A) #: **2722205**OWNER EQUIP NO.: **CS065249**REPAIR ☐

and/or

ALTERATION ☒Partial ☐ Final ☒

1. **Name and Address of Organization** doing Repair/Alteration Enerflex Systems Ltd. Compression Services
5049 74 Avenue S.E. Calgary AB. T2C 3H2 AQP No. & Expiry Date 1359(S) March 15/06
Location of Installation Ansell AB. LSD: 7-7-51-10 W5M
2. **Name of Owner** Husky Energy Inc c/o Tarten Engineering
Address 700, 110 -12 Avenue S.W. Calgary AB. T2R 0G7
3. **Boiler/Pressure Vessel Description** Stage Two Discharge Bottle CRN K3964.2
Manufacturer's Name Enerflex Systems Ltd. Serial No. 91013-04
4. **Design Conditions:**
a) Vessel/Shellside/Boiler: Max Allowable Working Press. 655 PSIG Min/Max Design Temp -20F/300F
b) Jacket/Tubeside: Max Allowable Working Press. Min/Max Design Temp /
5. **Description of defects** (location and types of deterioration that resulted in the repair/alteration). Altered to meet customer requirements.
6. **ASME Code Edition and Addenda** used for work: ASME Sect. VIII Year 2004 Addenda 2005
7. **Repair/Alter. Description of Work.** Step by step description of repair/alteration method, attach additional sheets as needed.

Note 1: Repair/Alteration Procedure to be accepted by ABSA SCO prior to start of work.

UT thickness band scanning and MPI inspection to ABSA #114 guideline. See attached report.

Cut existing 8" nozzle at 9 1/2" from center of vessel and install new 8" SCH. XH weld cap. Installed a 3/4"

CL6000 TOL for C6 drain connection on weld cap. Installed a new N1 6" XH CL900 RFWN flange and SA106-B

SMLS pipe with a 2" offset from center of vessel. Two new connections C3, and C4 were added to shell and N1

nozzle. Two new name plate brackets were added to shell. Bottle hydro tested to 983 PSIG. Design submitted

to ABSA. A new 1/2" rolled repad was added to N1.

8. **Material** - List any material used in repair/alteration and any base material welded on:

Item	Mat'l Spec.	Thick/Sch	Diam	Item	Mat'l Spec.	Thick/Sch	Diam
Shell/Drum	SA106-B/SA516-70N	.500"	14"	Heads/ Ends			
Tubeshe				Tubes			
Nozzles	SA106-B/SA234-WPB	.432	6"/8"	Flanges/Fitting	SA105N	Class 900	6"

9. **Welding Procedure** - Alberta Registration Number WP- 807.2 WPS Numbers used: ESL 101,103

10. **Heat Treatment:** Bake Out (Temp./Time) / hr Preheat Temp Post Weld HT (Temp./Time) /

11. **Non Destructive Examination** (Specify type and extent).

UT and MPI to ABSA #114 guideline.

(A) #: 2722205

OWNER EQUIP. NO. CS065249

12. Pressure Test

Vessel/Boiler/Shellside

Tubeside/Jacket

a) Hydrostatic 983 PSIG

b) Other Test

13. **Welded Replacement Parts:** Attached are Manufacturer's Partial Data Reports or Repair/Alteration Reports properly identified and signed by Authorized Inspectors for the following items of this report: (Welded parts supplied by others).

14. **Responsibility Owner/Client.** Identify below items that the owner/client has assumed responsibility for. **Note (2)**

a) Design Submission _____ b) Repair/Alteration Procedure: _____ c) Material Control _____
 d) Welding Control _____ e) NDE _____ f) Heat Treatment _____ g) Pressure Test _____

Note 2: Owner/client must have a valid Alberta Quality Program (AQP), for the scope of work, to assume responsibility for function c, d, e, f, or g.

15 REMARKS:

16.

CERTIFICATE OF COMPLIANCE

We certify that the statements made in this Report are correct and that all design, material, construction and workmanship on this repair/alteration conform to the requirements of the Alberta Safety Codes Act and Regulations.

a) For all items except for items identified in 14:
 Enerflex Systems Ltd. Compression Services

(Repair/Alteration Organization Name)

1359(S)

March 15/06

(AQP Number & Expiry Date)

(Signature & Date)

(Print Name)

b) For items identified in 14 only:

(Owner/Client Organization Name)

(AQP Number & Expiry Date)

(Signature & Date)

(Print Name)

17. DATE WORK WAS COMPLETED: _____

18.

CERTIFICATE OF INSPECTION

I have inspected the repairs and/or alterations described in this report. To the best of my knowledge this work has been done in accordance with the Safety Codes Act and Regulations.

a) Owner-User Inspection Certification (Field Only)
 (Required when Owner-User Inspects the work under their ABSA Authorized Owner-User Quality Program).

b) ABSA Safety Codes Officer Certification
 (when work is inspected by ABSA).

Owner-User AQP# & Expiry Date

Owner User In-Service Inspector Signature & Date

Owner-User In-Service Inspector Name (Please Print)

Owner-User In-Service Inspector Alberta Cert #

ABSA SCO Signature & Date

Print Name

Report Received by ABSA SCO

Date

C&P UNIT # 91013



MEMORANDUM

TO: BEV FYKE
FROM: DARCY JOHNSON
DATE: 12/20/99
SUBJECT: CS99665, MARATHON CANADA - SOUTH YOYO (Enerflex 91013)

Bev,

Please note the following major component serial numbers etc.:

Engine: Waukesha F3521GSI, S/N: C-10273/2, SPEC/N: 10273
Compressor: Ariel JGK-2, S/N: F-7727
6-1/4" Cylinder Throw 1: S/N: C-19448, VVCP S/N: U-7662
11" Cylinder Throw 2: S/N: C-19447, VVCP S/N: U-7661
Stage 1 Scrubber: S/N: 91013-01, CRN: K3962.2, A#2722140
Stage 1 Suction Bottle: S/N: 91013-03, CRN: K3963.2, A#2722188
Stage 1 Discharge Bottle: S/N: 91013-03, CRN: K3964.2, A#2722205
Stage 2 Scrubber: S/N: 91013-02, CRN: K3967.2, A#2722164
Stage 2 Suction Bottle: S/N: 91013-05, CRN: K3965.2, A#2722229
Stage 2 Discharge Bottle: S/N: 91013-06, CRN: K3966.2, A#2722377
Spartan Panel: S/N: M-2328B
Cooler: Air-X-Limited 108EH, S/N: 915000B
IC Section: S/N: 915000.3B, CRN: H6771.2, National Board # 19478
AC Section: S/N: 915000.4B, CRN: H7062.2, National Board # 19479

Thanks,



DIRECT TO: DARREN LYSENG DATE: 01/27/00
COMPANY: CONCISE DESIGN FAX NO: 237-7166
FROM: DARCY JOHNSON
REFERENCE: CS99665, MARATHON - SIERRA NO. OF PAGES: 7

Darren,

Please find attached the reference documentation confirming the following vessels are now registered in British Columbia.

Please note that I am making arrangements to have the nameplates stamped (in Burnell's Calgary Yard) accordingly by end of work day tomorrow, Friday, January 28, 2000.

- Stage 1 Suction Scrubber Alta. CRN: K3962.2, S/N: 91013-01, A# 2722140,
B.C. File # 1635, Revised B.C. CRN: K1635.1, Dwg. No: A-V11127, Rev.1
- Stage 1 Suction Bottle Alta. CRN: K3963.2, S/N: 91013-03, A# 2722188,
B.C. File # 1637, Revised B.C. CRN: K1637.1, Dwg. No: A-V11129, Rev.1
- Stage 1 Discharge Bottle Alta. CRN: K3964.2, S/N: 91013-04, A# 2722205,
B.C. CRN: K3964.21, Dwg. No: A-V11130, Rev. 1
- Stage 2 Suction Scrubber Alta. CRN: K3967.2, S/N: 91013-02, A# 2722164,
B.C. File # 1636, Revised B.C. CRN: K1636.1, Dwg. No: A-V11128, Rev.1
- Stage 2 Suction Bottle Alta. CRN: K3965.2, S/N: 91013-05, A# 2722229,
B.C. File # 1638, Revised B.C. CRN: K1638.1, Dwg. No: A-V11131, Rev.1
- Stage 2 Discharge Bottle Alta. CRN: K3966.2, S/N: 91013-06, A# 2722377,
B.C. File # 1639, Revised B.C. CRN: K1639.1, Dwg. No: A-V11132, Rev.2

Any questions? Please advise.

Regards,



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
5049 74TH AVE SE
CALGARY ALTA
T2C 3H2

Registered: 2000/01/26
Journal #: 23005
Account #: 27045

Attn: BEV FYKE

BC File#: 1635

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K1635.1

Drawings / Documents	Description			
STG 1 SUCTION SCRUBBER A-V11127 REV 1	MDMT ----- -20 F	MAWT ----- 300 F	MAWP ----- 655 psi	EXT PRESS -----
REGISTERED	This registration is for used vessel, Alberta # A2722140, previously registered under CRN K3962.2.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. GUPTA
Design Surveyor

Ministry of
Municipal Affairs

Safety Engineering
Services Division
Boiler Gas & Railway
Safety Branch

Suite 400 88 - 6th Street
New Westminster, BC V3L 5B3

Telephone: (604) 660-6254
Facsimile: (604) 660-3460



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
 5049 74TH AVE SE
 CALGARY ALTA
 T2C 3H2

Registered: 2000/01/26
 Journal #: 23007
 Account #: 27045

Attn: BEV FYKE

BC File#: 1637

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K1637-1

Drawings / Documents	Description			
STG 1 SUCTION BOTTLE A-V11129 REV 1	MDMT ----- -20 F	MAWT ----- 300 F	MAWP ----- 655 psi	EXT PRESS -----
REGISTERED	This registration is for used vessel, Alberta # A2722188, previously registered under CRN K3963.2.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. GUPTA
 Design Surveyor

am

Ministry of
 Municipal Affairs

Safety Engineering
 Services Division
 Boiler Gas & Railway
 Safety Branch

Suite 400 88 - 6th Street
 New Westminster, BC V3L 5B3

Telephone: (604) 660-6254
 Facsimile: (604) 660-3460



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
 5049 74TH AVE SE
 CALGARY ALTA
 T2C 3H2

Registered: 2000/01/26
 Journal #: 23008
 Account #: 27045

Attn: BEV PYKE

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K3964.21

Drawings / Documents	Description			
STG 1 DISCHARGE BOTTLE A-V11130 REV 1	MDMT	MAWT	MAWP	EXT PRESS
	-20 F	300 F	655 psi	
REGISTERED	This registration is for used vessel, Alberta # A2722205, previously registered under CRN K3964.2.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. GUPTA
 Design Surveyor

Ministry of
 Municipal Affairs

Safety Engineering
 Services Division
 Boiler Gas & Railway
 Safety Branch

Suite 400 88 - 6th Street
 New Westminster, BC V3L 5B3

Telephone: (604) 660-6254
 Facsimile: (604) 660-3460



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
5049 74TH AVE SE
CALGARY ALTA
T2C 3H2

Registered: 2000/01/26
Journal #: 23006
Account #: 27045

Attn: BEV FYKE

BC File#: 1636

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K1636.1

Drawings / Documents	Description			
STG 2 SCRUBBER A-V11128 REV 1	MDMT ----- -20 F	MAWT ----- 300 F	MAWP ----- 655 psi	EXT PRESS -----
REGISTERED	This registration is for used vessel, Alberta # A2722164, previously registered under CRN K3967.2.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. Gupta
S. GUPTA
Design Surveyor



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
 5049 74TH AVE SE
 CALGARY ALTA
 T2C 3H2

Registered: 2000/01/26
 Journal #: 23009
 Account #: 27045

Attn: BEV EYKE

BC File#: 1638

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K1638-1

Drawings / Documents	Description			
STG 2 SUCTION BOTTLE A-V11131 REV 1	MDMT	MAWT	MAWP	EXT PRESS
	-20 F	300 F	655 psi	
This registration is for used vessel, Alberta # A2722229, previously registered under CRN K3965.2.				

REGISTERED

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. GUPTA
 Design Surveyor

Ministry of
 Municipal Affairs

Safety Engineering
 Services Division
 Boiler Gas & Railway
 Safety Branch

Suite 400 88 - 6th Street
 New Westminster, BC V3L 5B3

Telephone: (604) 660-6254
 Facsimile: (604) 660-3460



TO: COMPRESSION SERVICES & ENERFLEX LEASING LTD
 5049 74TH AVE SE
 CALGARY ALTA
 T2C 3H2

Registered: 2000/01/26
 Journal #: 23010
 Account #: 27045

Attn: BEV FYKE

BC File#: 1639

Re: COMPRESSION SERVICES

DESIGN REGISTRATION

C.R.N.

K1639.1

Drawings / Documents	Description			
STG 2 DISCHARGE BOTTLE A-V11132 REV.2	MDMT	MAWT	MAWP	EXT PRESS
	----- -20 F	----- 350 F	----- 1490 psi	-----
REGISTERED	This registration is for used vessel, Alberta # A2722377, previously registered under CRN K3966.2.			

Remarks: This design has been registered as noted above. An invoice for survey will follow in the amount of \$ 60.00

Yours truly,

S. GUPTA

Design Surveyor

Ministry of
Municipal Affairs

Safety Engineering
Services Division
Boiler Gas & Railway
Safety Branch

Suite 400 88 - 6th Street
New Westminster, BC V3L 5B3

Telephone: (604) 660-6254
Facsimile: (604) 660-3460

DIRECT TO: DARREN LYSENG

DATE: 12/30/99

COMPANY: CONCISE DESIGN

FAX NO: 237-7166

FROM: DARCY JOHNSON

REFERENCE: CS99665, MARATHON - S.YOYO

NO. OF PAGES: 5

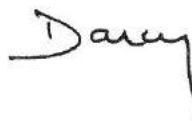
Darren,

Please find attached reference documentation confirming that the Air-X cooler's IC and AC sections are not registered in British Columbia.

Please note that I will provide vessel confirmation data when complete and available.

Any questions? Please advise.

Regards,



USED FOR
SERIAL # 915000.3B

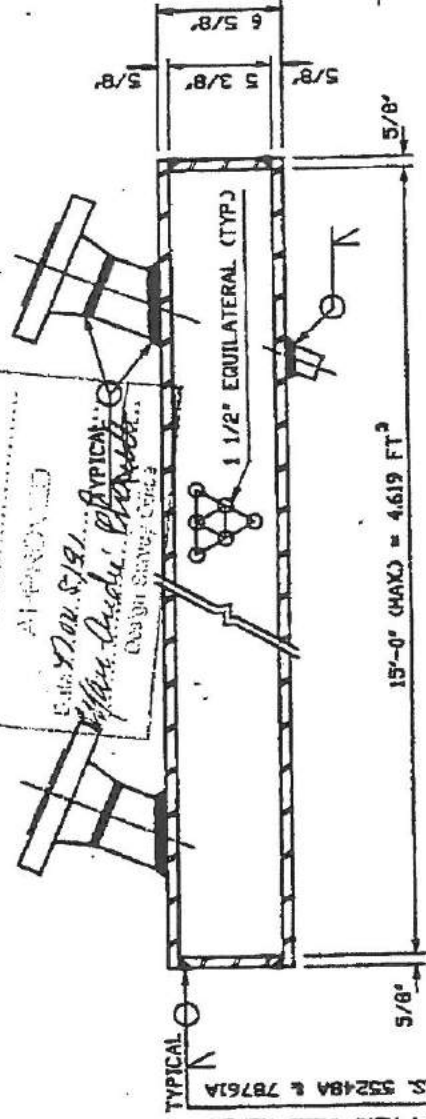
Saskatoon
Boiler & P.V. Safety
Division

CRN. H. 6771.23
No. 20291

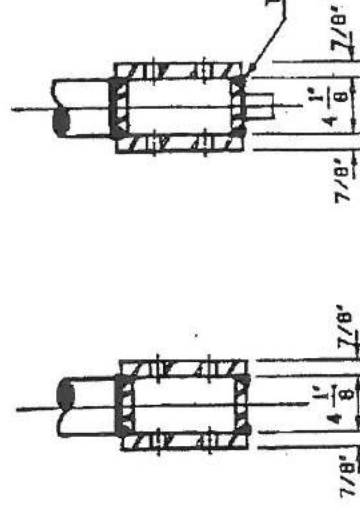
APPROVED
By: *[Signature]*
Date: May 1, 1989
Design Survey Code 2

SPECIFICATIONS

- 1) TUBES - SA-214 WELDED STEEL - 5/8" O.D., 16 B.V.G. WITH ALUMINUM SPIRAL FINS.
- 2) ACCESS PLUGS - HEX HEAD 3/4" NF, SHLD, STL (SA-105).
- 3) TUBE HOLES DRILLED AND REAMED TO .632" ±.002".
- 4) PLUG HOLES TAPPED FOR 3/4" NF.
- 5) ALL PLATE - SA-516-70.
- 6) NOZZLES - 4"-300 R.F.W.M. (SA-105) SCH. 80 BORE WITH 4" SCH. 80 PIPE (SA-106-B).
- 7) DESIGN PRESSURE - 664 P.S.I. @ 250/-20° F.
- 8) HYDROSTATIC TEST - 996 P.S.I.
- 9) ALL WELDS - FULL PENETRATION
- 10) SECTION DESIGNED, CONSTRUCTED, TESTED AND STAMPED IN STRICT ACCORDANCE WITH A1987 ASME CODE, SECTION VIII, DIV. 1, APPX. XIII. DESIGN REF. UG 80 (7).
- 11) TUBES HOLES ARE GROOVED PER TEMA C 7.4.4.
- 12) CPLGS. - 1"-3000 # FULL (SA-105).
- 13) CORROSION ALLOWANCE - 1/16".



CROSS SECTION - SIDE VIEW



CROSS SECTION - END VIEW

ALBERTA LABOUR
General Safety Services Division
BOILERS & PRESSURE VESSELS ACT

REG. No. **B 6771.2**
DWS. No. **90574**

Design Press. kPa	45.78
Design Temp. °C	-25/pt.

ACCEPTED
1989 MAY 11
By: *[Signature]*
Mo. Day
B. C. DESAI, P. ENG.
DESIGN SURVEY ENGINEER

NEXT ASSY	AIR-X-CHANGERS		
90544-C	TULSA, OKLAHOMA		
REF DWGS	DETAIL OF IC HEADERS		
BY	LES CHKD	WT.	
DATE	2-28-89	APPD	DATE 2/8/89
SCALE	NONE	DWG #	REV
ENERFLEX	INR 885264		90574

FOR TYP. HOR. WELD REFER
TO DWGS. 55248A & 78761A



Province of
British Columbia

Ministry of
Municipal Affairs,
Recreation and Culture
BOILER AND PRESSURE VESSEL
SAFETY BRANCH

Safety Engineering
Services Division
Second Floor, 601 West Broadway
Vancouver
British Columbia
V5Z 4G9
Telephone: (604) 660-6250
Fax: (604) 660-6215

YOUR FILE

OUR FILE H0775

Account # 163

TO: AIR-X-CHANGERS

P.O. BOX 1804
TULSA,
OKLAHOMA
74101

Date: 90.09.27

Jnl #: 3424

Attn: DAVID W. WATKINS

DESIGN ACCEPTANCE
& REGISTRATION

BRITISH COLUMBIA MIN. OF MUNICIPAL AFFAIRS SAFETY ENGINEERING SERVICES DIVISION
<u>REGISTERED</u>
Date <u>SEP 27 1990</u>
B.C. File <u>H0775</u>
C.R.N. <u>H6771.21</u>
Boiler/Pressure Vessel Branch

Drawings/documents	Description	Purpose
90574	IC HEADERS Registered for: 664 psi @ 250 Deg F. M.D.M.T: -20 Deg F.	Design Registration: B.C. File: H0775 C.R.N: H6771.21

Remarks: This design has been registered as noted above.

Yours truly,

Susana Katz,
Design Surveyor

(st
incl:
cc:

USED FOR
SERIAL # 915000.4B

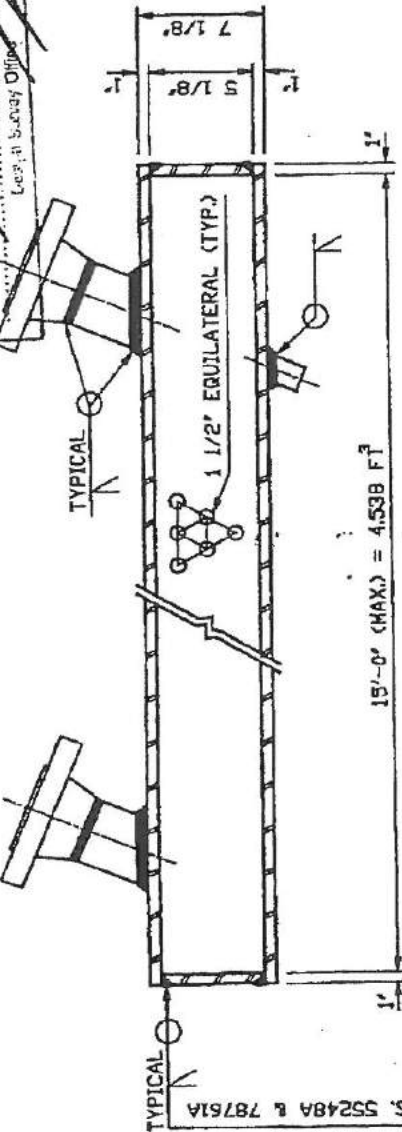
Alberta Labour
General Safety Services Division
Boilers & Pressure Vessel
Safety Branch

CRN H 7062.23
File 18192
Date 1586 p.m.
Temp 300°F

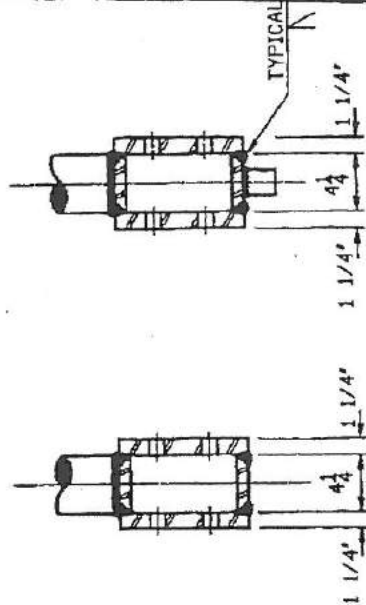
REMOVED

Date Sept 7, 1989

Design Office



CROSS SECTION - SIDE VIEW



CROSS SECTION - END VIEW

SPECIFICATIONS

- 1) TUBES - SA-214 WELDED STEEL - 5/8" O.D. 16 B.W.G. WITH ALUMINUM SPIRAL FIN.
- 2) ACCESS PLUGS - HEX HEAD 3/4" N.F. SHLD. STL. (SA-105).
- 3) TUBE HOLES DRILLED AND REAMED TO .632" ±.002".
- 4) PLUG HOLES TAPPED FOR 3/4" N.F.
- 5) ALL PLATE - SA-516-70 (NORMALIZED).
- 6) NOZZLES - 4"-900 R.F.W.N. (SA-105) SCH. 80 BORE WITH 4" SCH. 80 PIPE (SA-106-B).
- 7) DESIGN PRESSURE - 1586 P.S.I. @ 300/-20° F.
- 8) HYDROSTATIC TEST - 2379 P.S.I.
- 9) ALL WELDS - FULL PENETRATION.
- 10) SECTION DESIGNED, CONSTRUCTED, TESTED AND STAMPED IN STRICT ACCORDANCE WITH A1987 ASME. CODE SECTION VIII DIV. 1 APPX. XII DESIGN REF UCS-66(a) CURVE D.
- 11) TUBES HOLES ARE GROOVED PER TEMA C 7.44.
- 12) OPLGS. - 1'-3000 # FULL (SA-105).
- 13) CORROSION ALLOWANCE - 1/16".

ALBERTA LABOUR
General Safety Services Division
BOILERS & PRESSURE VESSELS ACT

DES. No. R 7062.2
DWG. No. 91002

Design Press kPa 10935

Design Temp. °C 251/49

ACCEPTED: [Signature]

1989 MAY 10

Yr. Mo. Day Signed B. C. DESAI, P. Eng.

DESIGN SURVEY ENGINEER

NEXT ASSY 91001
REF DWGS

AIR-X-CHANGERS
TULSA, OKLAHOMA

BY	LES	CHKD	WT.
DATE	4-11-89	APPROD	DATE 4-5-89
SCALE	NONE	DWG #	REV
ENERFLEX	JOB	895029	91002



Province of
British Columbia

Ministry of
Municipal Affairs,
Recreation and Housing
BOILER AND PRESSURE VESSEL
SAFETY BRANCH

Safety Engineering
Services Division
Suite 300, 750 Pacific Boulevard
Vancouver
British Columbia
V6B 5E7
Telephone: (604) 660-6250
Fax: (604) 660-6215

YOUR FILE

OUR FILE H4832
Account # 163

TO: AIR-X-CHANGERS

P.O. BOX 1804
TULSA,
OKLAHOMA
74101

Date: 94.01.06
Jnl #: 9275

Attn: DAVID W. WATKINS

DESIGN REGISTRATION

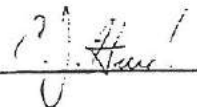
BRITISH COLUMBIA MIN. OF MUNICIPAL AFFAIRS SAFETY ENGINEERING SERVICES DIVISION
REGISTERED
Date JAN 06 1994
B.C. File H4832
C.R.N. H7062.2
Boiler/Pressure Vessel Branch

Drawings/documents	Description	Purpose
91002	AC HEADERS Registered for: 1586 psi @ 300°F M.D.M.T: -20°F	Design Registration: B.C. File: H4832 C.R.N: H7062.21

Remarks: This design has been registered as noted above.

1/st
Encl:
cc:

Yours truly,


Ed J. Hurd,
Design Surveyor

DIRECT TO: DARREN LYSENG **DATE:** 12/22/99
COMPANY: CONCISE DESIGN **FAX NO:** 237-7166
FROM: DARCY JOHNSON
REFERENCE: CS99665, MARATHON - S. YOYO **NO. OF PAGES:** 8

Darren,

Please note that I (Darcy Johnson) will be representing Compression Services (CS) as the Project Manager for your Marathon Canada – South YoYo vessel re-registration project (our reference number CS99665). My direct telephone number is 720-1617 and my fax number is 720-3766.

Please provide me with the following information:

- Please confirm that the site's proper name is "~~South YoYo~~".
- Please advise what the correct site LSD number is.

SIERRA
C-98-B/94-I-14

Please find attached a copy of the Ultrasonic Testing (UT) reports identifying the existing thickness of the cooler sections. Please note that I have initiated a P.O. to Air - X for British Columbia registration of the following cooler sections, and supplied the cooler UT report:

- | | | | |
|------|----------------|--------------|---------------------------|
| • IC | S/N: 915000.3B | CRN: H6771.2 | National Board No.: 19478 |
| • AC | S/N: 915000.4B | CRN: H7062.2 | National Board No.: 19479 |

Please find attached a copy of the Ultrasonic Testing (UT) reports identifying the existing thickness of the process vessels to assist in our registering these vessels:

- | | | | |
|----------------------------|---------------|--------------|-----------|
| • Stage 1 Scrubber | S/N: 91013-01 | CRN: K3962.2 | A#2722140 |
| • Stage 1 Suction Bottle | S/N: 91013-03 | CRN: K3963.2 | A#2722188 |
| • Stage 1 Discharge Bottle | S/N: 91013-04 | CRN: K3964.2 | A#2722205 |
| • Stage 2 Scrubber | S/N: 91013-02 | CRN: K3967.2 | A#2722164 |
| • Stage 2 Suction Bottle | S/N: 91013-05 | CRN: K3965.2 | A#2722229 |
| • Stage 2 Discharge Bottle | S/N: 91013-06 | CRN: K3966.2 | A#2722377 |

Please note that all parties have been advised that registration is to be complete by January 14, 2000:

Any questions? Please advise.

Regards,

Darcy



MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.
QUALITY SYSTEM CAN/CSA-Q9003-1991.

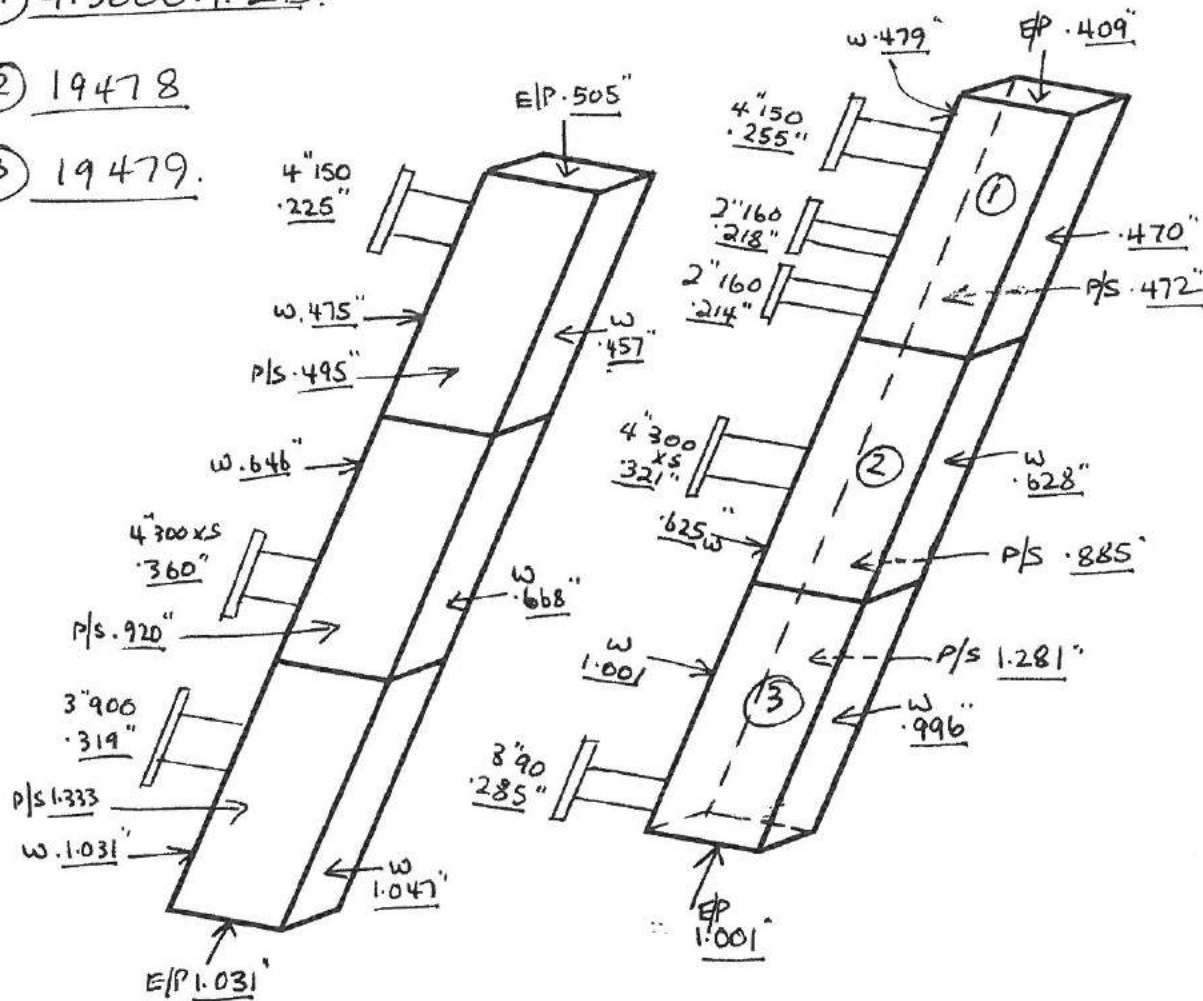
ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 990118-391.	Procedure No UP 2
Work Description THICKNESS INSPECTION OF COOLER SECTION JCB CS 99665			Code ASME
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXPOSEN
Instrument KRAUTKRAMER	Model UP1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

① 915000.1.2B.

② 19478

③ 19479.



EP = END PLATE, W = WRAPPER, P/S = PLUG SHEET.

FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99
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MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.

QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 9910118-391	Procedure No UP 2
Work Description THICKNESS INSPECTION OF PRESSURE VESSEL CS 99665.			Code ASME
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXOSIN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

(A) 272205

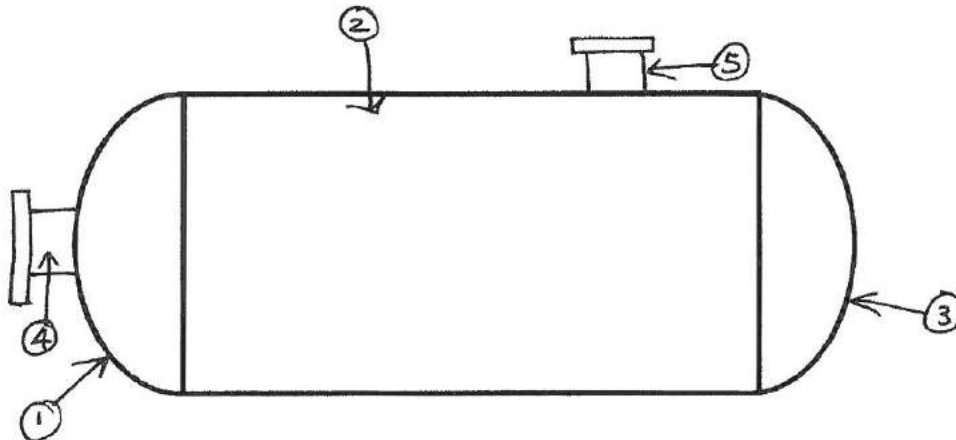
(1) HEAD = .672"

(2) SHELL = .528"

(3) HEAD = .470"

(4) 4" 300 XLS = .672"

(5) 8" 400 XLS = .501"



FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL 	DATE 21/12/99.
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MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.

QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 990118-391.	P/O No
		Procedure No UP 2	
Work Description THICKNESS INSPECTION OF PRESSURE VESSEL JOB CS 99665.			Code ASME
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXOGEN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

① 2722377

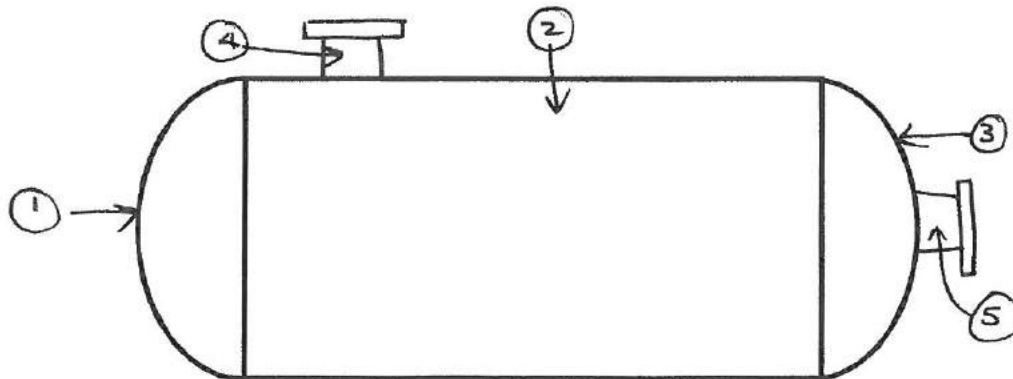
① HEAD = .881"

② SHELL = .822"

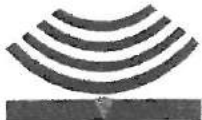
③ HEAD = .905"

④ 4"1500 XXS = .655"

⑤ 3"900 XXS = .581"



FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99.
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MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.

QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 990118-391	P/O No Procedure No UP 2
Work Description THICKNESS INSPECTION OF PRESSURE VESSELS JOB CS 99665.			Code ASME
Calibration Std IIV BLOCK	Material STEEL	Surface GOOD	Couplant EXOSIN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

① 2722229

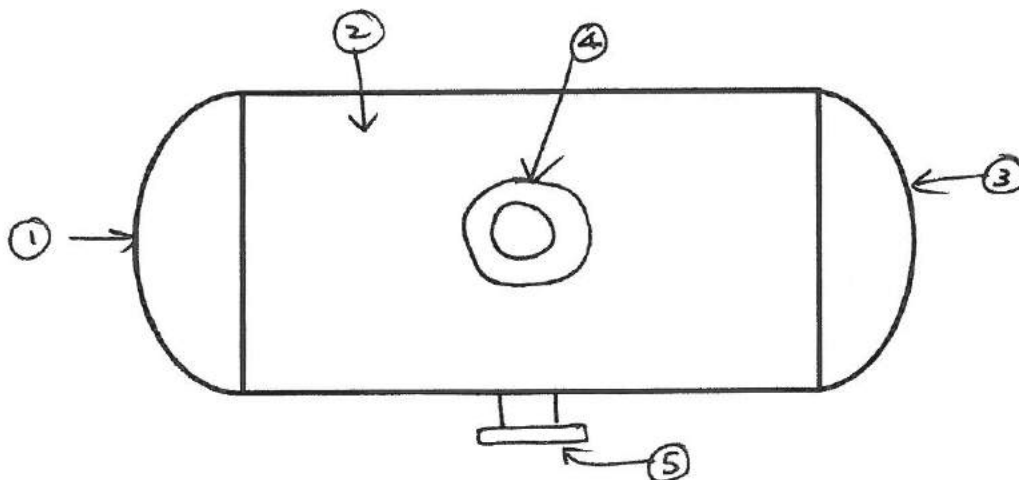
① HEAD = .459"

② SHELL = .472"

③ HEAD = .462"

④ 4'300 XS = .660"

⑤ 4'1500 XXS = .659"



FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99.
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MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.
QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 99 0118-391.	Procedure No UP 2
Work Description THICKNESS INSPECTION OF PRESSURE VESSELS JOB # CS 99665.			Code ASME
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXOSIN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

④ 2722188

① HEAD = .694"

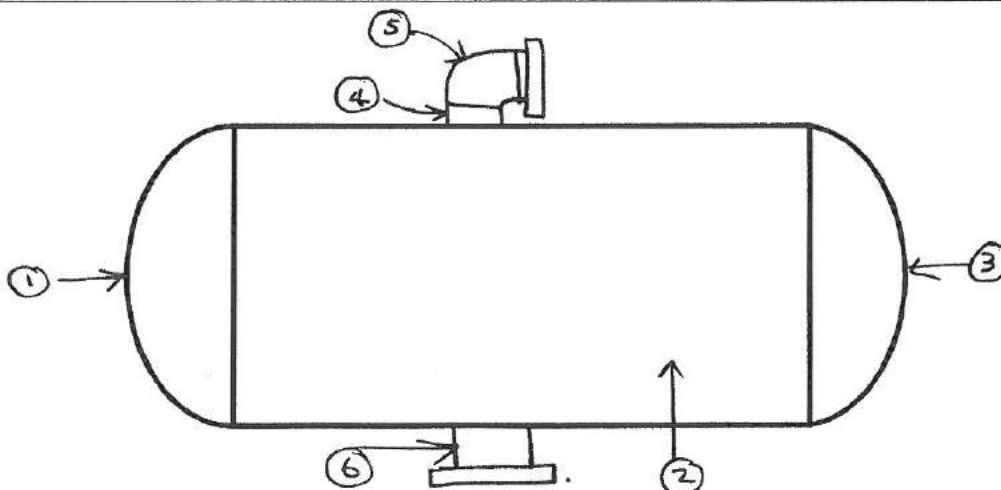
② SHELL = .640"

③ HEAD = .693"

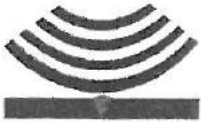
④ 6" ϕ = .415"

⑤ 6" 300 = .420"

⑥ 8" 400 XS = .489



FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99.
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MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.
QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 0118-391	P/O No UP 2
Work Description THICKNESS INSPECTION OF PRESSURE VESSEL JOB CS 99665.		Code ASME	
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXOSIN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

(A) 2722164

(1) HEAD = .627"

(2) SHELL = .650"

(3) HEAD = .641"

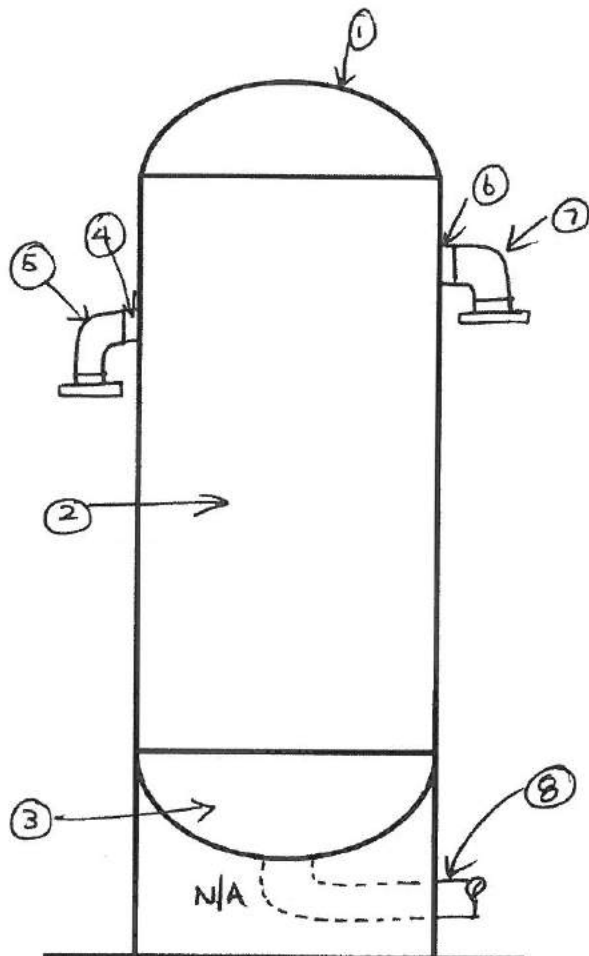
(4) 4"XS = .328"

(5) 4'300 XS = .314"

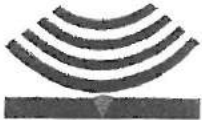
(6) 4"XS = .330"

(7) 4'300 XS = .289"

(8) 2" drain = .285"



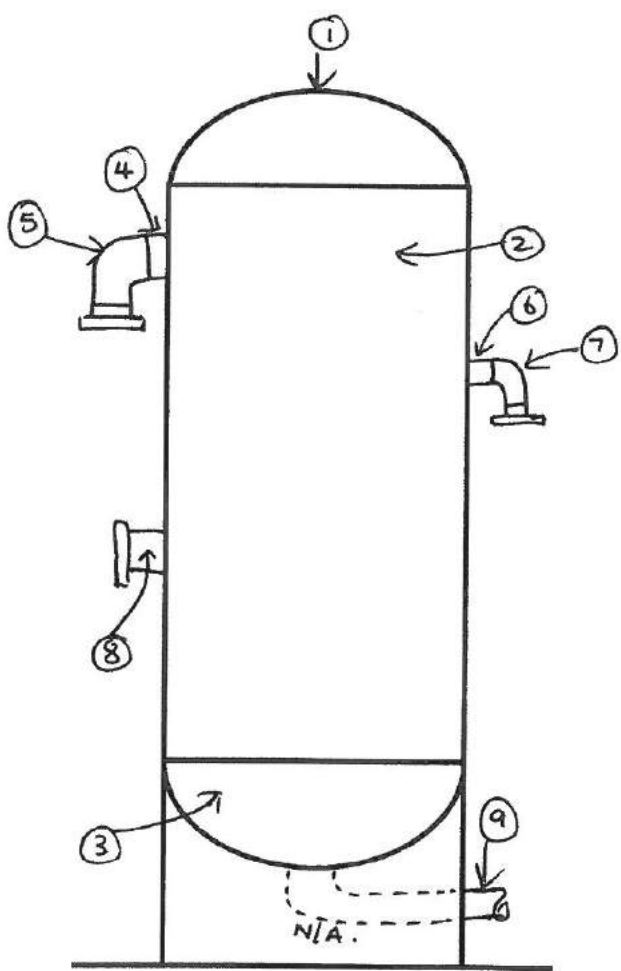
FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99.
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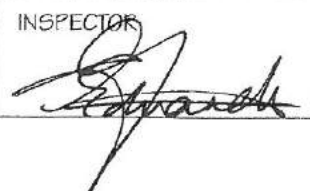


MARK EDWARDS TESTING AND INSPECTION SERVICES LTD.
QUALITY SYSTEM CAN/CSA-Q9003-1991.

ULTRASONIC TEST REPORT

Client COMPRESSION SERVICES LTD		Address 5409 74TH AVE SE CAL AB	
Requested by MR G HART		Job No 990118- 391	Procedure No UP 2
Work Description THICKNESS INSPECTION OF PRESSURE VESSEL JCR # CS 99665		Code ASME	
Calibration Std IIW BLOCK	Material STEEL	Surface GOOD	Couplant EXOSIN
Instrument KRAUTKRAMER	Model UP 1	Search Unit 1/2" DIA 5 MHZ FDU	Inspector M. EDWARDS

(A) 2722140	
(1) HEAD = .524"	
(2) SHELL = .648"	
(3) HEAD = .560"	
(4) 6" XS = .385"	
(5) 6"300 XS = .416"	
(6) 2"Ø = .350"	
(7) 2"300 = .290"	
(8) 6"300 XS = .410"	
(9) 2"Ø = .270"	

FORM UTR 1 REV 1	CLIENT	INSPECTOR 	LEVEL SNT III CGSB II	DATE 21/12/99.
------------------------	--------	--	-----------------------------	-------------------

UNIT COMMISSIONING INFORMATION

DATE: _____

SEND TO PAMCO: _____ ATTENTION: _____

COPY TO: WILLARD MARTIN/BILL GIBB ADDITIONAL COPY TO: _____

PROJECT ENGINEER: KEN J BROWN SALES ENGINEER: RICK HOLBROOKCUSTOMER: OPINAC EXPLORATION UNIT#: 91012CONTACT NAME: D. BRIAN HAYWARD PHONE#: 262-3622ADDRESS: H 1000, 530 - 8 AVE S.W. T2P 3S8CALGARY, AB

UNIT LOCATION: _____ UNASSIGNED

SITE CONTACT PERSON: _____ T.B.A. PHONE#: _____

START-UP AS PER QUOTATION: _____ NO ALLOWANCE INCLUDED IN QUOTATION: ☒

DAYS: _____ HOURS: _____ PRE-GROUT ALLOWANCE: _____ KM: _____

SUBSISTENCE: _____

FIELD COMPLETION: TO ESL ACCOUNT: N/A TO CUSTOMER ACCOUNT: _____

OTHER: _____ DETAILS: _____

PERFORMANCE DATA: COPIES INCLUDED: _____ TO FOLLOW: ☒UNIT MANUALS SHIPPING DATE: JUNE 19/91 COMMENT: _____BLUEPRINTS/DRAWINGS: JUNE 19/91 W/ MANUALS

PART SHORTAGES (OR AS ATTACHED): _____

SITE RE-ASSEMBLY: AS PER QUOTATION _____ RE-ASSEMBLY NOT INCLUDED ☒

DETAILS: _____

UNIT INFO: ENG. WAUK. F3521GS1 IGNITION ALTRONIC II PANEL SPARTONTYPE: MICROGUARD II COOLER: AIR-X 108 EH COMP: ARIEL 36K/2CYL NO./SIZE: 1- 6 1/4" BORE, 1- 11" BORESKID TYPE: PORTABLE SKID C/W INTEGRAL WASTE OILTANK & DIST. PIECE/PACKING VENT TANK.

UNIT COMMISSIONING
ADDITIONAL INFORMATION

PAGE 2 OF 2

UNIT INFORMATION:

DRIVER MOD#: WAUK. F3521 GSIU S/N: 403290 ARR#: C-10195
DRIVER IGN TYPE: ALTRONIC III FUEL FILTER P/N: KTOOL#FG-24
ENGINE AIR INLET: DRY FILTER ELEMENT P/N: WAUKESHIA STANDARD
COMP MOD#: JGK / 2 S/N: F-7726
COMP CYL S/N: C-19445 BORE: 11" (K) SUC U P/N: B-1135-M DISH U P/N: B-1136-N
COMP CYL S/N: C-19446 BORE: 6 1/4" (K) SUC U P/N: B-1079-L DISH U P/N: B-1345-L
COMP CYL S/N: _____ BORE: _____ SUC U P/N: _____ DISH U P/N: _____
COMP CYL S/N: _____ BORE: _____ SUC U P/N: _____ DISH U P/N: _____
COMP CYL S/N: _____ BORE: _____ SUC U P/N: _____ DISH U P/N: _____
COMP CYL S/N: _____ BORE: _____ SUC U P/N: _____ DISH U P/N: _____
COMP VALVE PLATE MATERIAL: HOERBIGER PEEK THERMOPLASTIC
BELTS - ENG/J-SHAFT: 3C-82 'V' J-SHAFT/COOLER: 3C 202 'V'
INLET SEPARATOR FILTER ELEMENTS P/N: MESH TYPE QTY: -
SKID DESCRIPTION: PORTABLE C/W WASTE TANKS CRANE: 2-TON RUNNING BRIDGE
CONTACT PERSON RESPONSIBLE FOR THE PURCHASE OF SPARE PARTS:
NAME: LARRY BRAUN PHONE: 823-6655
ADDRESS: 75 RIVERSIDE DRIVE EAST TOS OYO
Box 1479 DRUMHELLER, A.B.
NOTES: _____

DATE: 28 May 91 PROJECT ENG. OR SALES ENG.: [Signature]

90/12/13

C&P UNIT² 91012 & 91013

MATERIAL LIST

WORK ORDER: X91012

DATE: 05/06/91

PAGE 05A.01

CUSTOMER: 10013 BPINAC EXPLORATION LIMITED

SECTION NO: 05A

NAME: DRIVER EQUIPMENT

QTY	CODE	DESCRIPTION	
1	BNE-48T10	PISTON CHECK VALVE, 1" NPT NEWCO 48TFS2 800# WOG	. 170
1	BNU-T310	BALL VALVE, 1" NPT NUTRON T3R10S20B 2000# WOG RP CS WITH HANDLE	. 180
1	BEN-FUL001	GAS FILTER, ESL 6-5/8" D. NPT CONN, 230 PSIG. MWP DWG. #05.4001 (FUL-001) WI (1) KTOOL FG-24 ELEMENT	. 190
1	BNE-8111	RELIEF VALVE, MERCER SERIES 8100 1" X 1" NPT. (ORIFICE AREA = 0.212 SQ. IN.) SET AT 165 PSIG	. 200
1	NPN-3	LEVEL GAUGE, PENBERTHY TX11	. 210
1	BPE-305	SET GAUGE VALVES, PENBERTHY 305 3/4" NPT CS	. 220
1	BFI-R180530	RELIEF VALVE, 1" NPT FISHER 1805-1, C.I., 10-60 PSI SET 30 PSI	. 230
1	BFI-627S325	REGULATOR, 1" NPT FISHER 627-553 C.S. 3/8" DR. 15-40 PSI SPR, SET 25 PSI, 150-500 PSI SUPPLY.	. 250
4	BDY-VME306	BALL VALVE, 3/4" NPT DYNA-GUIP VME3-A9 2000#. WOG RP WI HANDLE	. 260
2	BBH-1412	BRAIDED STEEL HOSE, 1-1/2" NPTM ENDS, 12" LONG	. 270
1	BDR-C20	SLEEVE COUPLING, 2" DRESSER STYLE 90 STRAIGHT	. 280
1	BNI-T5620	BALL VALVE, 2" NPT NIBCO T560-CS-R-25 2000# WOG RP WI LATCHING HANDLE	. 290
2	BNI-T5610	BALL VALVE, 1" NPT NIBCO T560-CS-R-25 2000# WOG RP WI LATCHING HANDLE	. 300
1	BNI-T5606	BALL VALVE, 3/4" NPT NIBCO T560-CS-R-25 2000# WOG RP WI LATCHING HANDLE	. 310
1	BDY-VME304	BALL VALVE, 1/2" NPT DYNA-GUIP VME3-A9 2000#. WOG RP WI HANDLE	. 320

DRAWINGS

MATERIAL LIST

MTR'S REQ'D YES ☐ NO ☒

ITEM	QTY	DESCRIPTION	MATERIAL	HEAT NUMBER
1	1	5/8" NOM. 24" OD ROLLED PLATE X 1664 (65 1/2")	SA516-70N	
2	1	24" NOM. SCH. STD SMLS PIPE (.375") X 370 (14 3/4") (SKIRT)	SA106-B	
3	2	5/8" NOM 24" O.D. 2:1 SE. HEAD .500" MIN WT 2" SF	SA516-70N	
4	1	6" NOM. SCH. XH SMLS PIPE (.432") X 250 (9 21/32")	SA106-B	
5	1	6" NOM. SCH. XH SMLS PIPE (.432") X 114 (4 1/2")	SA106-B	
6	1	1 1/2" NOM. SCH. 160 SMLS PIPE (.250") X 93 (3 1/2")	SA106-B	
7	1	1 1/2" NOM. SCH. 160 SMLS PIPE (.250") X 353 (14 1/8")	SA106-B	
8	1	2" NOM. SCH. 160 SMLS PIPE (.344") X 103 (4 1/16")	SA106-B	
9	—	" NOM. SCH. SMLS PIPE () X	SA106-B	
10	—	" - 6000# SOCKOLETE (FLAT)	SA105	
11	1	1 1/2" - SCH 160 90° LR WELD ELBOW (.281")	SA234-WPB	
12	2	3/4" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
13	1	1" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
14	2	2" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
15	1	2" - 3000# THREDOLET (FLAT)	SA105	
16	2	2" - 6000# HEX HEAD PLUG	SA105	
17	2	1/2" NOM. PLATE X 168 (6 5/8") 10x270 (10 5/8") O.D. ROLLED REPAD	SA516-70	
18	—	" NOM. PLATE X O.D. REPAD	SA516-70	
19	2	6" - 300# RFWN FLANGE SCH. XH BORE	SA105	
20	1	2" - 300# RFWN FLANGE SCH 160 BORE	SA105	
21	1	6" NOM. SCH. XH 90° L.R. WELD ELBOW (.432")	SA234-WPB	
22	1	2" NOM. SCH. 160 90° L.R. WELD ELBOW (.344")	SA234-WPB	
23	4	1" NOM. PLATE X 102 (4") X 103 (4 1/16") DWG. SCR-023	SA36	
24	4	1" NOM. PLATE X 102 (4") X 103 (4 1/16") DWG. SCR-023	SA36	
25	8	1/2" X 4" FLAT BAR X 320 (12 1/2") (GUSSETS)	SA36	
26	1	6" THK MESH TYP MIST EXTRACTOR X 578 (22 3/4") O.D. *9 DEN	SS 304	
27	2	STANDARD EXPANDED METAL X 578 (22 3/4") O.D.	SA36	
28	AR	1" X 1/4" FLAT BAR X 4577 (1510")	SA36	
29	1	1/8" X 5" FORMED CHANNEL 1" X 5 1/2" LONG	SA36	
30	1	C B X 11.5 X 523 (20 3/8") LONG (DEFLECTOR)	SA36	
31	—	5" NOM. SCH. STD SMLS PIPE (.258") X 102 LONG PRESSED	SA106-B	
—	—	— OVAL INSTALLED WITH OVAL IN VERTICAL		
32	2	1" THK PLATE X 102 (4") W X 130 (5 1/8") LONG	SA-36	
33	2	1 1/2" - 3000# THREDOLET FOR 24" NOM PIPE	SA-105	
34	1	3/8" X 1 1/2" FLAT BAR X 203 (8") CUT TO SUIT	SA36	

NOZZLE SCHEDULE

MK	QTY	SIZE	TYPE	RATING	SCH	MATERIAL	SERVICE	INTERNAL PROJ.	EXTERNAL PROJ.	REPADS
N1	1	6"	RFWN	300#	XH	SA105	INLET	25 (1")	295 (11 5/8")	1/2" x 2"
N2	1	6"	RFWN	300#	XH	SA105	OUTLET	FLUSH	464 (18 1/4")	1/2" x 2"
C3	2	1 1/2"	TOL	3000#	—	SA105	LEVEL SENSOR	—	—	—
C4	1	2"	TOL	3000#	—	SA105	LEVEL CONTROLLER	—	—	—
C5	1	1"	TOL	3000#	—	SA105	AUTO DUMP	—	—	—
C6	1	1 1/2"	NPTM	—	160	SA106-B	DRAIN	—	76 (3")	—
C7	2	3/4"	TOL	3000#	—	SA105	LEVEL INDICATOR	—	—	—
C8	2	2"	TOL	3000#	—	SA105	INSP. /CLEANOUT	—	—	PLUG
N9	1	2"	RFWN	300#	160	SA105	BYPASS	FLUSH	235 (9 1/4")	—
10						SA105				

TITLE:

JOB. NO.

DWG. NO.

REV.

3

STG 1 SUCTION SCRUBBER

91012/13

A-VII/27

0

3

GENERAL NOTES

1. Construction in accordance with ASME code section VIII, Division I, 1989 edition. AND 1985 ADDENDA.
2. Inspection by the Provincial Government Boiler Inspector - yes.
3. Design Pressure 655 psig @ 300 °F, corrosion allowance .0625 in.
4. Hydrostatic test at 983 psig (Ltd. by design).
5. Post weld heat treatment (stress relieved) 0 minutes at 1100°F.
6. RADIOGRAPHY - FULL-UW 11(a)-5(b).
7. Vessel to be cleaned & oiled internally.
8. All repads to have 1, 1/8" tell tale hole.
9. Qualified welding procedures registered WP-807.2.
(a) ESL-101 (b) ESL-103 (c) ESL-109 (d) ESL-101 for tack welds
10. Quality control program registered AQP(S)-1044/AQP-1111.
11. Length between tangents 69 1/2 in.
12. Length over all 94 in.
13. Seam to seam 65 1/2 in.
14. Capacity 16.47 FT³.
15. Vessel weight 1666 Lb.
16. Vessel sandblasted externally & internally.
17. Ansi flanges are used unless otherwise noted.
18. Vessel service is SWEET gas.
19. No Charpy impact test required per UG-20(f).

NAME PLATE DATA

Year: 1991
 CRN: _____ NAT. BRD. _____
 SN: 91012/13-02
 MAWP 655 psig at 300 °F.
 MINIMUM DESIGN METAL TEMPERATURE -20 °F @ 655 PSIG.
 SH. THK. .625 in NOM. MAT'L SA 516-70-N
 SH. THK. 15.875 mm NOM.
 HD. THK. per MTR in MIN. MAT'L SA 516-70-N
 HD. THK. per MTR mm MIN.



W
RT- 2

BOILER'S BRANCH ACCEPTANCE STAMP

VESSEL TYPE: STAGE 2 SCRUBBER
 D.P. 655 PSIG @ 300 °F
 D.P. 4516 kPa @ 149 °C
 SHELL DIA.: 24 " CA: .0625 "
 CUSTOMER OPINAC EXPLORATION LTD.
 LOCATION:
 LSD:

ENERFLEX SYSTEMS LTD.

Calgary 7720-48 Street S.E.

SR# 91012/13

DATE 91-03-06

RELS'D BY _____ CHK'D BY _____ DWN BY _____ DWG. NO.

J.L.A. A-VIII/28 1/3

MATERIAL LIST

MTR'S REQ'D YES ☐ NO ☒

ITEM	QTY	DESCRIPTION	MATERIAL	HEAT NUMBER
1	1	5/8" NOM. 24" O.D. ROLLED PLATE X 1664 (65 1/2")	SA-516-70N	
2	1	24" NOM. SCH. STD SMLS PIPE (.375") X 370 (149 1/2") (SKIRT)	SA106-B	
3	2	5/8" NOM. 24" O.D. 2:1 S.E. HEAD .500" MIN. WT. 2" SF	SA516-70N	
4	1	4" NOM. SCH. XH SMLS PIPE (.337") X 123 (47 1/2")	SA106-B	
5	1	4" NOM. SCH. XH SMLS PIPE (.337") X 108 (4 1/4")	SA106-B	
6	1	1 1/2" NOM. SCH. 160 SMLS PIPE (.250") X 93 (3 1/2")	SA106-B	
7	1	1 1/2" NOM. SCH. 160 SMLS PIPE (.250") X 359 (14 1/8")	SA106-B	
8	-	2" NOM. SCH. 160 SMLS PIPE (.344") X 103 (4 1/16")	SA106-B	
9	-	" NOM. SCH. SMLS PIPE () X	SA106-B	
10	-	" - 6000# SOCKOLETE (FLAT)	SA105	
11	1	1 1/2" - SCH 160 90° L.R. WELD ELBOW (.281")	SA234-WPB	
12	2	3/4" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
13	1	1" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
14	2	2" - 3000# THREDOLET FOR 24" NOM. PIPE	SA105	
15	1	2" - 3000# THREDOLET (FLAT)	SA105	
16	2	2" - 6000# HEX HEAD PLUG	SA105	
17	2	3/8" NOM. PLATE X 114 (4 1/2") ID X 216 (8 1/2") O.D. ROLLED REPAD	SA516-70	
18	-	" NOM. PLATE X O.D. REPAD	SA516-70	
19	2	4" - 300# RFWN FLANGE SCH. XH BORE	SA105	
20	-	2" - 300# RFWN FLANGE SCH 160 BORE	SA105	
21	2	4" NOM. SCH. XH 90° L.R. WELD ELBOW (.337")	SA234-WPB	
22	-	2" NOM. SCH. 160 90° L.R. WELD ELBOW (.344")	SA234-WPB	
23	4	1" NOM. PLATE X 102 (4") X 103 (4 1/16") DWG. SCR-023	SA36	
24	4	1" NOM. PLATE X 102 (4") X 103 (4 1/16") DWG. SCR-023	SA36	
25	8	1/2" X 4" FLAT BAR X 320 (12 1/2") (GUSSETS)	SA36	
26	1	6" THK MESH TYPE MIST EXTRACTOR X 578 (22 3/4") O.D. #9 DEN	SS304	
27	2	STANDARD EXPANDED METAL X 578 (22 3/4") O.D.	SA36	
28	AR	1" X 1/4" FLAT BAR X 4572 (15'-0")	SA36	
29	1	1/8" X 5" FORMED CHANNEL 1" X 5 1/2" LONG	SA36	
30	1	C 6 X 10.5 X 512 (20 1/2") LONG (DEFLECTOR)	SA36	
31	-	5" NOM. SCH. STD SMLS PIPE (.258") X 102 LONG PRESSED	SA106-B	
-	-	OVAL INSTALLED WITH OVAL IN VERTICAL		
32	2	1" THK PLATE X 102 (4") W X 130 (5 1/5") LONG	SA-36	
33	2	1 1/2" - 3000# THREDOLET FOR 24" NOM PIPE	SA-105	

NOZZLE SCHEDULE

WK	QTY	SIZE	TYPE	RATING	SCH	MATERIAL	SERVICE	INTERNAL PROJ.	EXTERNAL PROJ.	REPADS
N1	1	4"	RFWN	300#	XH	SA105	INLET	25 (")	355 (14")	7/8" X 2"
N2	1	4"	RFWN	300#	XH	SA105	OUTLET	FLUSH	355 (14")	7/8" X 2"
C3A	2	1 1/2"	TOL	3000#	-	SA105	LEVEL SENSOR	-	-	-
C4	1	2"	TOL	3000#	-	SA105	LEVEL CONTROLLER	-	-	-
C5	1	1"	TOL	3000#	-	SA105	AUTO DUMP	-	-	-
C6	1	1 1/2"	NPTM	-	160	SA106-B	DRAIN	-	76 (3")	-
C7B	2	3/4"	TOL	3000#	-	SA105	LEVEL INDICATOR	-	-	-
C8A	2	2"	TOL	3000#	-	SA105	INSP. /CLEANOUT	-	-	PLUG
N9	-	-	-	-	-	SA105	BYPASS	-	-	-
10	-	-	-	-	-	SA105	-	-	-	-

TITLE:

STG 2 SUCTION SCRUBBER

JOB. NO.

91012/13

DWG. NO.

A-VIII28

REV.

0

3

3

GENERAL NOTES

Construction in accordance with ASME code section VIII, Division I, 1989 edition. AND 1989 ADDENDA.

Inspection by the Provincial Government Boiler Inspector - yes.

Design Pressure 655 psig @ 300 °F, corrosion allowance .0625 in.

Hydrostatic test at 983 psig (Ltd. by design).

Post weld heat treatment (stress relieved) 0 minutes at 1100°F.

RADIOGRAPHY - FULL-UW 11(g)-5(b)

Vessel to be cleaned & oiled internally.

All repads to have 1, 1/8" tell tale hole.

Qualified welding procedures registered WP-807.2.

(A) ESL-101 (B) ESL-103 (C) ESL-109 (D) TACK WELD ESL-101

Quality control program registered AQP(5)1044

Length between tangents 58 in.

Length over all 69 1/4 in.

Seam to seam 54 in.

Capacity 5.9 FT³.

Vessel weight 887 Lb.

Vessel sandblasted externally & internally.

Ansi flanges are used unless otherwise noted.

Vessel service is sweet gas.

No Charpy impact test required per UG-20(f).

NAME PLATE DATA

Year: 1991

CRN: _____ NAT. F.D. _____

SN: 91012/13-03

MAWP 655 psig

MINIMUM DESIGN METAL THK

SH. THK. .656 in

SH. THK. 16.662

HD. THK. per MTR

HD. THK. per MTR

300 °F.

20 °F @ 655 PSIG.

106-B

16-70-N



W
RT- 2

USE ON JOB
#CS015A2
01/04/17

ILER'S BRANCH ACCEPTANCE STAMP

VESSEL TYPE: STAGE 1 SUCTION BOTTLE

D.P. 655 PSIG @ 300 °F

D.P. 4516 kPa @ 149 °C

SHELL DIA.: 16 " CA: .0625 "

CUSTOMER: OPINAC EXPLORATION LTD.

LOCATION:

LSD:

ENERFLEX SYSTEMS LTD.

Calgary 6839 - 44 Street S.E.

SR# 91012/13

DATE 91-03-06

RELS'D BY _____ CHK'D BY _____ DWN BY _____ DWG. NO.

/// J.L.A. A-VIII/29 1/3

MATERIAL LIST

NO.	QTY.	DESCRIPTION	MTR'S ☐ YES ☒ NO	MATERIAL	HEAT NUMBER
1.	1	16" NOM. SCH 60 SMLS. PIPE (.656") X 1372 (54")		SA 106-B	
2.	2	3/4" NOM. 16" O.D. 2:1 SE. HEAD .625" MIN WT 2" SF		SA 516-70	
3.	1	3/8" NOM. PLATE X 68 (6 5/8") I.D. 270 (10 5/8") O.D. ROLLED REPAD		SA 516-70	
4.	1	3/8" NOM. PLATE X 210 (8 5/8") I.D. 312 (12 5/8") O.D. ROLLED REPAD		SA 516-70	
5.	2	3/4" - 3000# THREDOLET (FOR 16" NOM. PIPE)		SA 105	
6.	1	3/4" - 3000# THREDOLET (FOR 16" NOM. PIPE)		SA 105	
7.	1	2" - 3000# THREDOLET (FLAT)		SA 105	
8.	1	2" - 3000# THREDOLET (FOR 16" NOM. PIPE)		SA 105	
9.	1	3/4" NOM. HEXAGON HEAD PLUG		SA 105	
10.	2	2" NOM. HEXAGON HEAD PLUG		SA 105	
11.	1	6" NOM. SCH XH SMLS. PIPE (.432") X 188 (7 13/32")		SA 106-B	
12.	1	6" 300# RFWN FLANGE SCH XH BORE		SA 105	
13.	1	X NOM. SCH CONCENTRIC WELD REDUCER (X)		SA 234WPE	
14.	1	6" NOM. SCH XH 90° LR WELD ELL (.432")		SA 234WPE	
15.	1	8" NOM. SCH XH SMLS PIPE (.500") X 138 (5 1/8")		SA-106-B	
16.	1	8" 400# RFWN FLANGE SCH XH BORE		SA-105	
17.	1	1/8" X 5-1/2" FORMED CHANNEL. 1" X 5-1/2" LONG.		SA 36	

NOTE:
D. FOR ITEM NO 2 = 3 TO 1 TAPER TO
SUIT .656" WT.

NOZZLE SCHEDULE

MK.	QTY.	SIZE	TYPE	RATING	MATERIAL	SCH.	SERVICE	INT. PROJ.	EXT. PROJ.	REPAD
N1	1	6"	RFWN	300#	SA-105	XH	INLET	FLUSH 530 (20 1/8")	3/8" X 2"	
N2	1	8"	RFWN	400#	SA-105	XH	OUTLET	FLUSH 200 (7 1/8")	3/8" X 2"	
C3	1		TOL		SA 105	--	TEMP SENSOR	--	--	--
C4	1	3/4"	TOL	3000#	SA 105	--	TEMP INDICATOR	--	--	--
C5	1	3/4"	TOL	3000#	SA 105	--	PRES. TAP	--	--	--
C6	1		TOL		SA 105	--	DRAIN	--	--	PLUG
C7%	2	2"	TOL	3000#	SA 105	--	INSP/CLEANOUT	--	--	PLUG

JOB # 91012/13

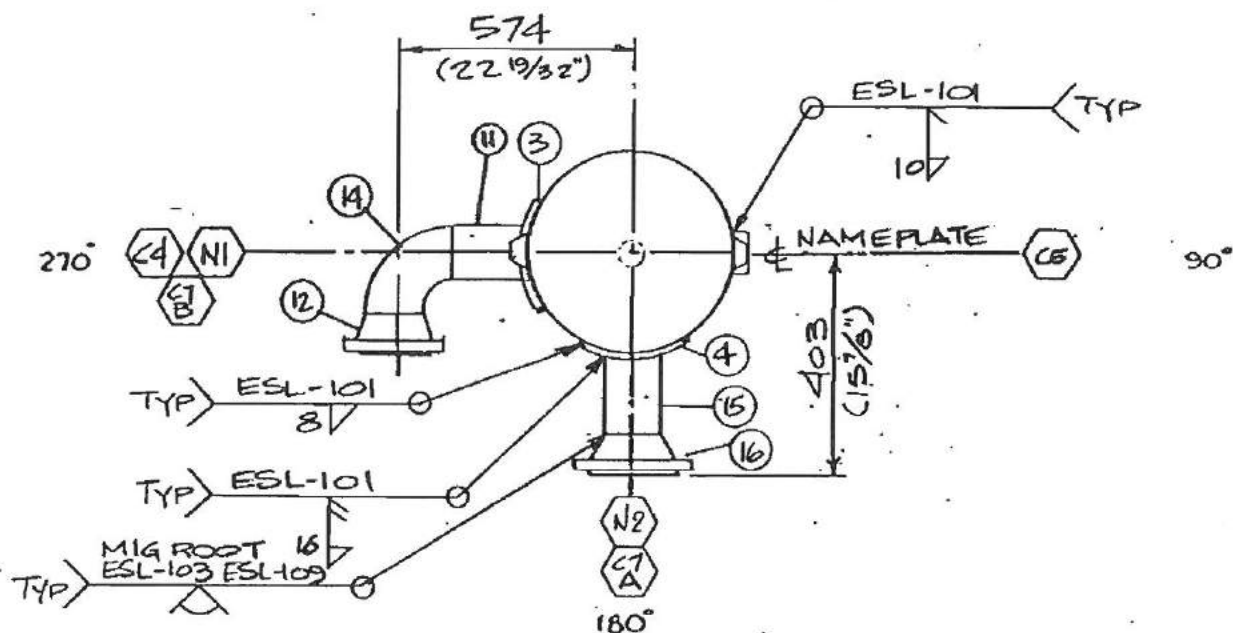
VESSEL TYPE: STG 1 SUCTION BOTTLE

DWG. NO. A-VII029

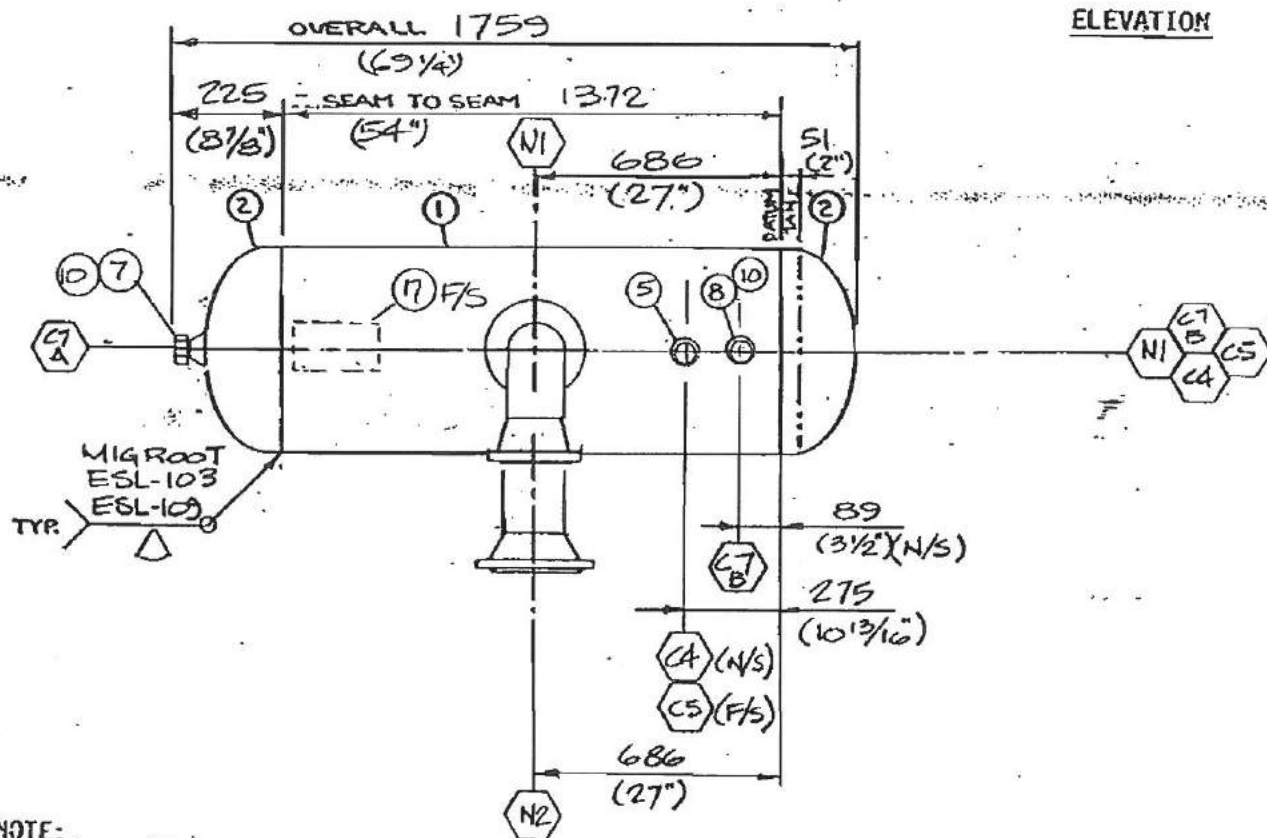
3/3

0

VESSEL TYPE: STG 1 SUCTION
BOTTLE



ELEVATION



NOTE:
All dimensions in millimeters

JOB # 91012/13

DRAWING NUMBER A-V11129

 $\frac{2}{3}$

GENERAL NOTES

Construction in accordance with ASME code section VIII, Division 1, 1989 edition. ~~AND 1989 ADDENDA~~

Inspection by the Provincial Government Boiler Inspector - yes.

Design Pressure 655 psig @ 300 °F, corrosion allowance .0625 in.

Hydrostatic test at 983 psig (Ltd. by design).

Post weld heat treatment (stress relieved) 0 minutes at 1100°F.

RADIOGRAPHY - FULL - UW 11(a) - 5(b)

Vessel to be cleaned & oiled internally.

All repads to have 1, 1/8" tell tale hole.

Qualified welding procedures registered WP-807.2.

(A) ESL-101 (B) ESL-103 (C) ESL-109 (D) TACK WELD ESL-101

Quality control program registered AQP (S) 1044

Length between tangents 58 1/32 in.

Length over all 75 7/8 in.

Seam to seam 54 in.

Capacity 4.76 FT³.

Vessel weight 588 Lb.

Vessel sandblasted externally & internally.

Ansi flanges are used unless otherwise noted.

Vessel service is sweet gas.

No Charpy impact test required per UG-20(f).

NAME PLATE DATA

Year: 1991

CRN: _____ NAT. BRD. _____

SN: 91012/13-04

MAWP 655 psig at 300 °F.

MINIMUM DESIGN METAL TEMPERATURE -20 °F @ 655 PSIG.

SH. THK. .5 in NOM. MAT'L SA 106-B

SH. THK. 12.7 mm NOM.

HD. THK. .4375 in MIN. MAT'L SA 234-WPB

HD. THK. 11.13 mm MIN.



W
RT- 2

WELDER'S BRANCH ACCEPTANCE STAMP

VESSEL TYPE: STAGE 1 DISCHARGE BOTTLE

D.P. 655 PSIG @ 300 °F

D.P. 4516 kPa @ 149 °C

SHELL DIA.: 14 " CA: .0625 "

CUSTOMER: OPINAC EXPLORATION LTD

LOCATION:

LSD:

ENERFLEX SYSTEMS LTD.

Calgary 6839 - 44 Street S.E.

SR# 91012/13

DATE 91-03-06

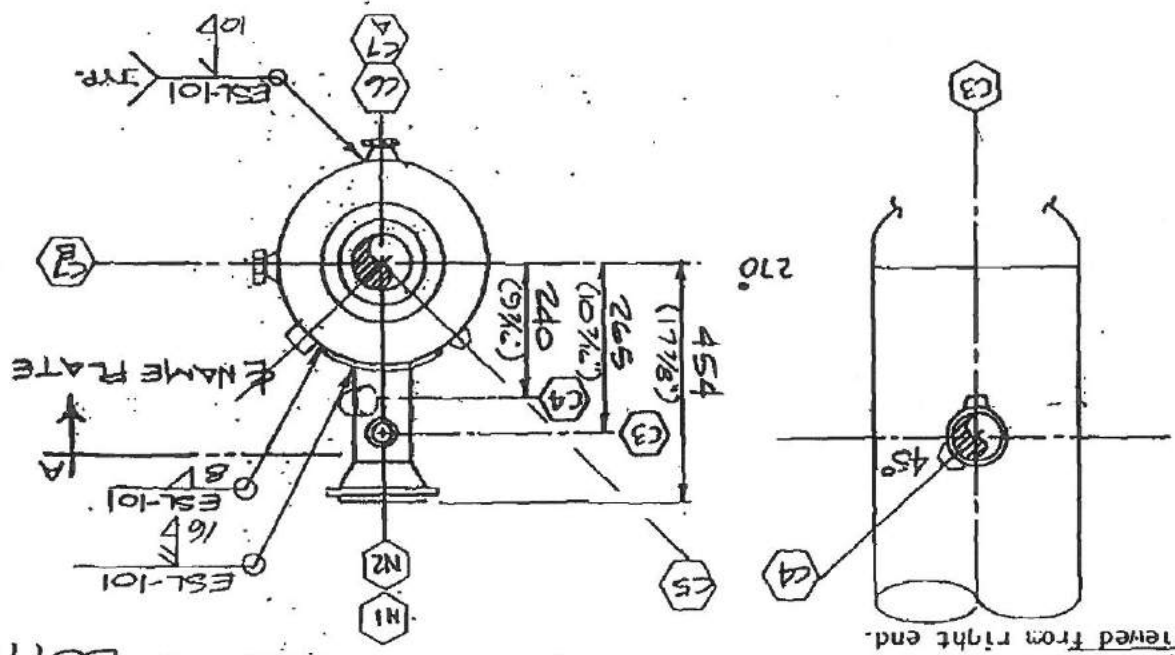
REK'D BY _____ CHK'D BY _____ DWN. BY _____ DWG. NO. _____

1/10

1/11

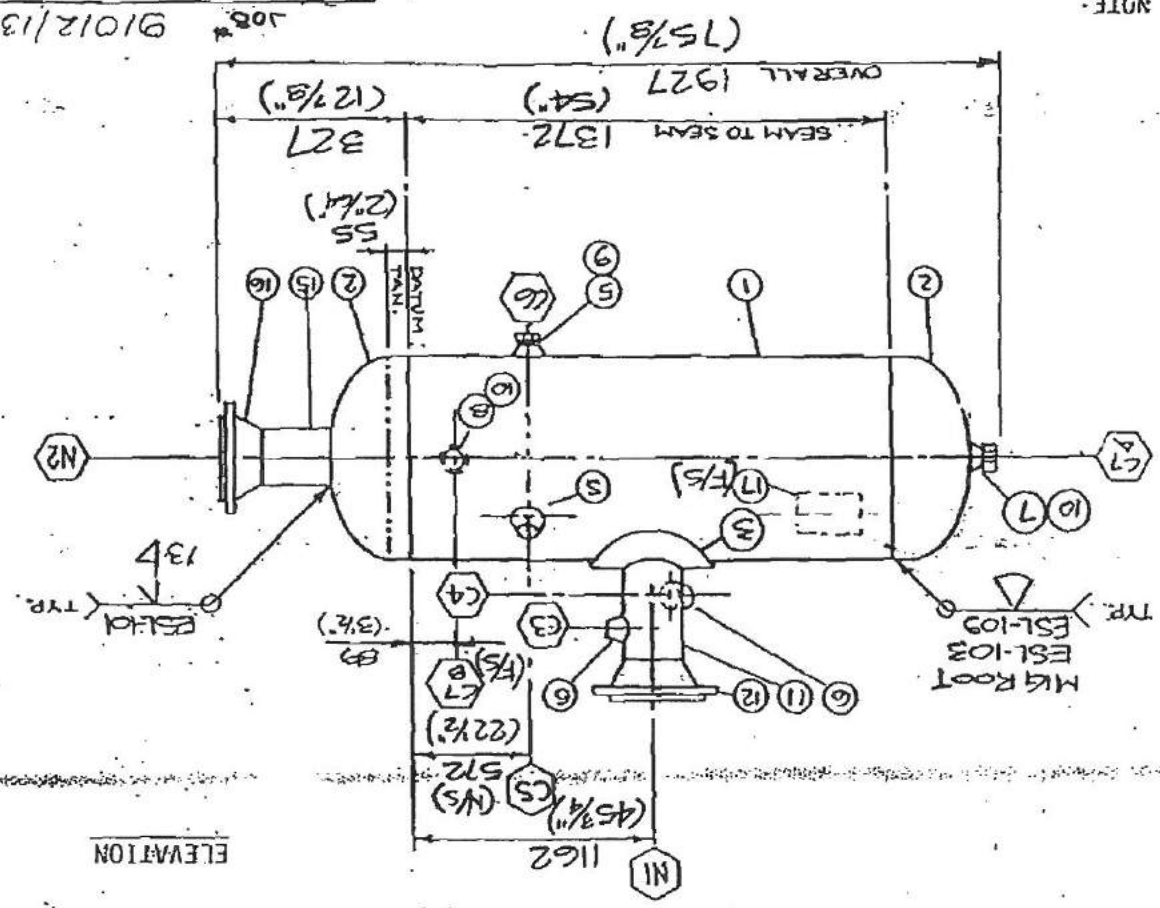
J.L.A. A-VIII/30 1/3

ORIENTATION:
As viewed from right end.



STANDARD VESSEL TYPE: BOTTLE

SECTION "A"



NOTE: All dimensions in millimeters

DRAWING NUMBER A-VIII30

91012/13

MATERIAL LIST

NO.	QTY.	DESCRIPTION	MTR'S ☐ YES ☒ NO	MATERIAL	HEAT NUMBER
1.	1	14" NOM. SCH XH SMLS. PIPE (.500") X 1372(54")		SA 106-B	
2.	2	14" NOM. SCH XH WELD CAP		SA 234-WPE	
3.	1	3/8" NOM. PLATE X 210 (8 5/8") I.D. 320 (12 5/8") O.D. ROLLED REPAD		SA 516-70	
4.	1	NOM. PLATE X I.D. O.D. REPAD		SA 516-70	
5.	2	3/4" - 3000# THREDOLET (FOR 14" NOM. PIPE)		SA 105	
6.	2	3/4" - 3000# THREDOLET (FOR 8" NOM. PIPE)		SA 105	
7.	1	2" - 3000# THREDOLET (FLAT)		SA 105	
8.	1	2" - 3000# THREDOLET (FOR 14" NOM. PIPE)		SA 105	
9.	1	3/4" NOM. HEXAGON HEAD PLUG		SA 105	
10.	2	2" NOM. HEXAGON HEAD PLUG		SA 105	
11.	1	8" NOM. SCH XH SMLS. PIPE (.500") X 216 (8 1/2")		SA 106-B	
12.	1	8" 400# RFWN FLANGE SCH XH BORE		SA 105	
13.	1	X NOM. SCH CONCENTRIC WELD REDUCER () X ()		SA 234WPE	
14.	1	NOM. SCH WELD ELL ()		SA 234WPE	
15.	1	4" NOM. SCH XXH SMLS PIPE (.674") X 100 (4 5/8")		SA 106-B	
16.	1	4" 300# RFWN FLANGE SCH XXH BORE		SA 105	
17.	1	1/8" X 5-1/2" FORMED CHANNEL. 1" X 5-1/2" LONG.		SA 36	

NOZZLE SCHEDULE

MK.	QTY.	SIZE	TYPE	RATING	MATERIAL	SCH.	SERVICE	INT. PROJ.	EXT. PROJ.	REPAD
N1	1	8"	RFWN	400#	SA-105	XH	INLET	FLUSH	2 1/2 (10 1/8)	3/8 x 2"
N2	1	4"	RFWN	300#	SA-105	XXH	OUTLET	FLUSH	3 1/2 (12 1/8)	---
C3	1	3/4"	TOL	3000#	SA 105	--	TEMP SENSOR	--	--	--
C4	1	3/4"	TOL	3000#	SA 105	--	TEMP INDICATOR	--	--	--
C5	1	3/4"	TOL	3000#	SA 105	--	PRES. TAP	--	--	--
C6	1	3/4"	TOL	3000#	SA 105	--	DRAIN	--	--	--
C7 1/2	2	2"	TOL	3000#	SA 105	--	INSP/CLEANOUT	--	--	PLUG PLUG

VESSEL TYPE: STG 1 DISCH. BOTTLE

DWG. NO.

A-VIII/30

3/3

Job # 91012/13

GENERAL NOTES

Construction in accordance with ASME code section VIII, Division I, 1989 edition AND 1982 ADDENDA

Inspection by the Provincial Government Boiler Inspector - yes.

Design Pressure 655 psig @ 300 °F, corrosion allowance .0625 in.

Hydrostatic test at 983 psig (Ltd. by design).

Post weld heat treatment (stress relieved) 0 minutes at 1100°F.

RADIOGRAPHY - FULL-VW 11(a) - 5(b)

Vessel to be cleaned & oiled internally.

All repads to have 1, 1/8" tell tale hole.

Qualified welding procedures registered WP-807.2.

(A) ESL-101 (B) ESL-103 (C) ESL-109 (D) TACK WELD ESL-101

Quality control program registered AQP (S) 1044

Length between tangents 34 1/32 in.

Length over all 43 25/32 in.

Seam to seam 30 in.

Capacity 2.38 FT³.

Vessel weight 361 Lb.

Vessel sandblasted externally & internally.

Ansi flanges are used unless otherwise noted.

Vessel service is sweet gas.

No Charpy impact test required per UG-20(f).

NAME PLATE DATA

Year: 1991

CRN: _____ NAT. BRD. _____

SN: 91012/13-05

MAWP 655 psig at 300 °F.

MINIMUM DESIGN METAL TEMPERATURE -20 °F @ 655 PSIG.

SH. THK. .5 in NOM. MAT'L SA 106-B

SH. THK. 12.7 mm NOM.

HD. THK. .4375 in MIN. MAT'L SA 234-WPB

HD. THK. 11.113 mm MIN.



W
RT- 2

ILIR'S BRANCH ACCEPTANCE STAMP

VESSEL TYPE: STAGE 2 SUCTION BOTTLE

D.P. 655 PSIG @ 300 °F

D.P. 4516 kPa @ 149 °C

SHELL DIA.: 12.75 " CA: .0625 "

CUSTOMER: OPINAC EXPLORATION LTD.

LOCATION:

LSD: _____

ENERFLEX SYSTEMS LTD.

Calgary 6839 - 44 Street S.E.

SR# 91012/13

DATE 91-03-06

RELS'D BY _____ CHK'D BY _____ DWN BY _____ DWG. NO. _____

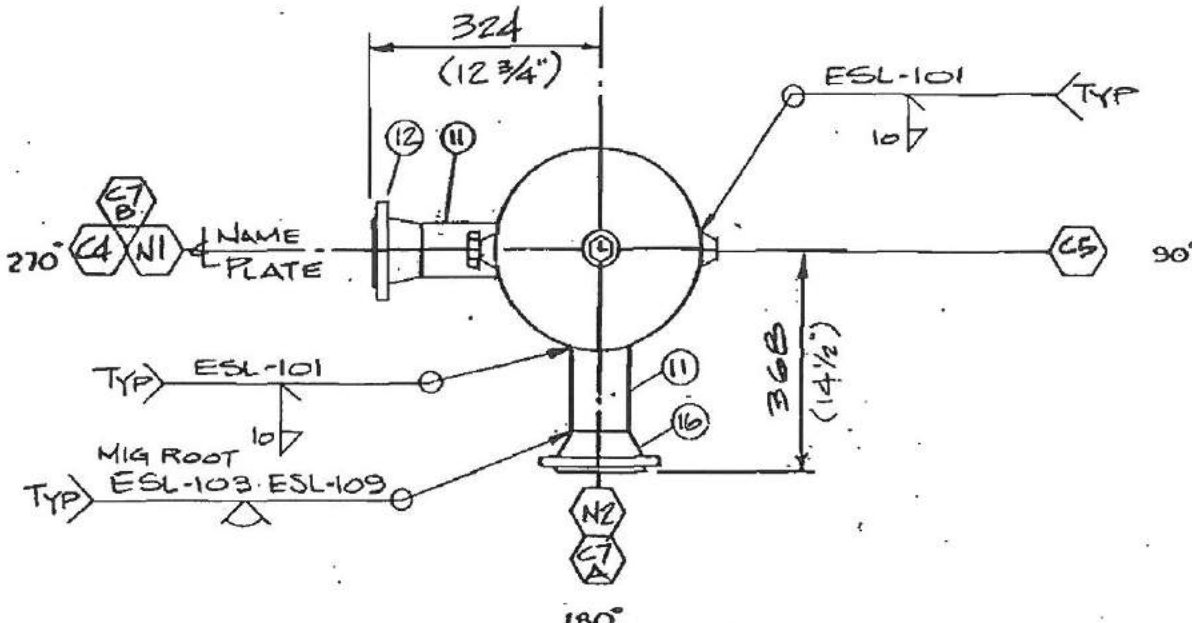
110

ALL

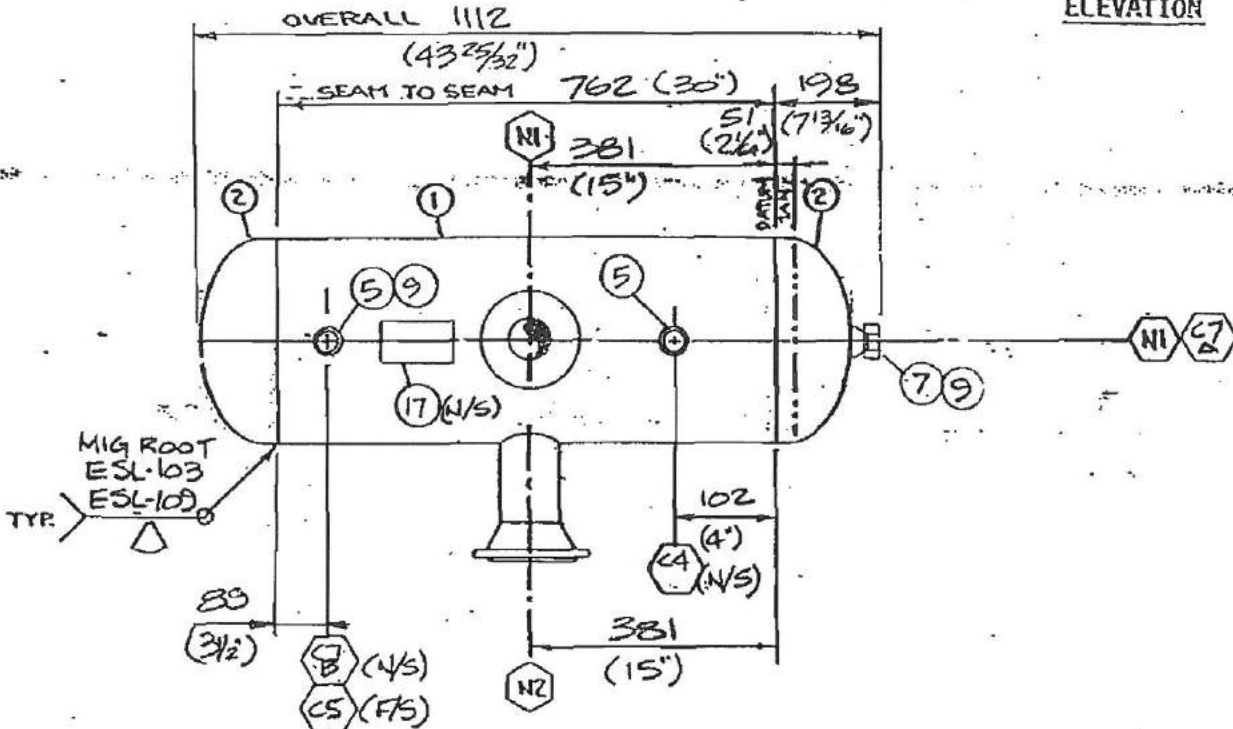
J.L.A. A-VIII31 1/3

As viewed from right end.

VESSEL TYPE:



ELEVATION



All dimensions in millimeters

Job 9/10/12/13

DRAWING NUMBER A-VIII 31

 $\frac{2}{3}$

MATERIAL LIST

NO.	QTY.	DESCRIPTION	MTR'S ☐ YES ☒ NO	MATERIAL	HEAT NUMBER
1.	1	12" NOM. SCH XXH SMLS. PIPE (.500") X 762 (30")		SA 106-B	
2.	2	12" NOM. SCH XXH WELD CAP		SA 234WPE	
3.	1	NOM. PLATE X I.D. O.D. ROLLED REPAD		SA 516-70	
4.	1	NOM. PLATE X I.D. O.D. REPAD		SA 516-70	
5.	3	3/4" - 3000# THREDOLET (FOR 12" NOM. PIPE)		SA 105	
6.	1	3/4" - .000# THREDOLET (FOR NOM. PIPE)		SA 105	
7.	1	3/4" - 3000# THREDOLET (FLAT)		SA 105	
8.	1	2" - 3000# THREDOLET (FOR NOM. PIPE)		SA 105	
9.	2	3/4" NOM. HEXAGON HEAD PLUG		SA 105	
10.	1	2" NOM. HEXAGON HEAD PLUG		SA 105	
11.	2	4" NOM. SCH XXH SMLS. PIPE (.674") X 110 (4 1/2")		SA 106-B	
12.	1	4" 300# RFWN FLANGE SCH XXH BORE		SA 105	
13.	1	X NOM. SCH CONCENTRIC WELD REDUCER (X)		SA 234WPE	
14.	1	NOM. SCH WELD ELL ()		SA 234WPE	
15.	1	NOM. SCH SMLS PIPE () X		SA 106-B	
16.	1	4" 1500# RFWN FLANGE SCH XXH BORE		SA 105	
17.	1	1/8" X 5-1/2" FORMED CHANNEL. 1" X 5-1/2" LONG.		SA 36	

NOZZLE SCHEDULE

MK.	QTY.	SIZE	TYPE	RATING	MATERIAL	SCH.	SERVICE	INT. PROJ.	EXT. PROJ.	REPAD
N1	1	4"	RFWN	300#	SA-105	XXH	INLET	FLUSH 162 (6 3/8")		
N2	1	4"	RFWN	1500#	SA-105	XXH	OUTLET	FLUSH 206 (8 1/8")		
C3	1		TOL		SA 105	--	TEMP SENSOR	--	--	--
C4	1	3/4"	TOL	3000#	SA 105	--	TEMP INDICATOR	--	--	--
C5	1	3/4"	TOL	3000#	SA 105	--	PRES. TAP	--	--	--
C6			TOL		SA 105	--	DRAIN	--	--	PLUG
C7	2	3/4"	TOL	3000#	SA 105	--	INSP/CLEANOUT	--	--	PLUG

SR # 91012/13

VESSEL TYPE: STG 2 SUCTION BOTTLE

OWG. NO. A-VIII 31

3/3

GENERAL NOTES

Construction in accordance with ASME code section VIII, Division I, 1989 edition, AND 1989 ADDENDA.

Inspection by the Provincial Government Boiler Inspector - yes.

Design Pressure 1490 psig @ 350 °F, corrosion allowance .0625 in.

Hydrostatic test at 2235 psig (Ltd. by design).

Post weld heat treatment (stress relieved) 0 minutes at 1100°F.

RADIOGRAPHY - FULL-UW 11(a)-5(b).

Vessel to be cleaned & oiled internally.

All repads to have 1, 1/8" tell tale hole.

Qualified welding procedures registered WP-807.2.

(a) ESL-101 (B) ESL-103 (C) ESL-109 (D) TACK WELD ESL-101

Quality control program registered AQP (S) 1044

Length between tangents 40 in.

Length over all 56 7/32 in.

Seam to seam 36 in.

Capacity 2.45 FT³.

Vessel weight 607 Lb.

Vessel sandblasted externally & internally.

Ansi flanges are used unless otherwise noted.

Vessel service is sweet gas.

No Charpy impact test required per UG-20(f).

NAME PLATE DATA

Year: 1991

CRN: _____ NAT. BRD. _____

SN: 91012/13-06

MAWP 1490 psig at 350 °F.

MINIMUM DESIGN METAL TEMPERATURE -20 °F @ 1490 PSIG.

SH. THK. .844 in NOM. MAT'L SA 106-B

SH. THK. 21.438 mm NOM.

HD. THK. per MTR in MIN. MAT'L SA 516-70-N

HD. THK. per MTR mm MIN.



W
RT- 2.

ILER'S BRANCH ACCEPTANCE STAMP

△ NI NOZZLE ADD REPAD 03/25/91

VESSEL TYPE: STAGE 2 DISCHARGE BOTTLE

D.P. 1490 PSIG @ 350 °F

D.P. 10273 kPa @ 177 °C

SHELL DIA.: 12.75 " CA: .0625 "

CUSTOMER: OPINAC EXPLORATION LTD.

LOCATION:

LSD:

ENERFLEX SYSTEMS LTD.

Calgary 6839 - 44 Street S.E.

SR# 91012/13

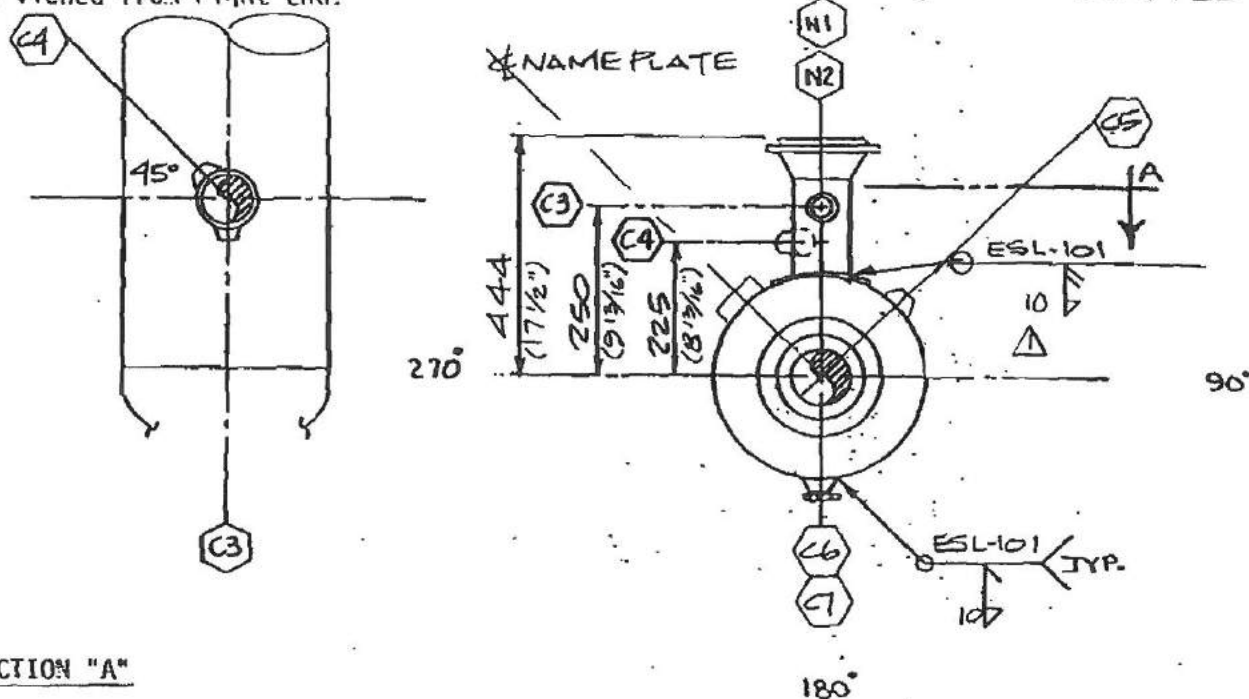
DATE 91-03-06

RELEASED BY _____ CHK'D BY _____ DWN BY _____ DWG. NO. _____

J.L.A. A-VIII/32 1/3

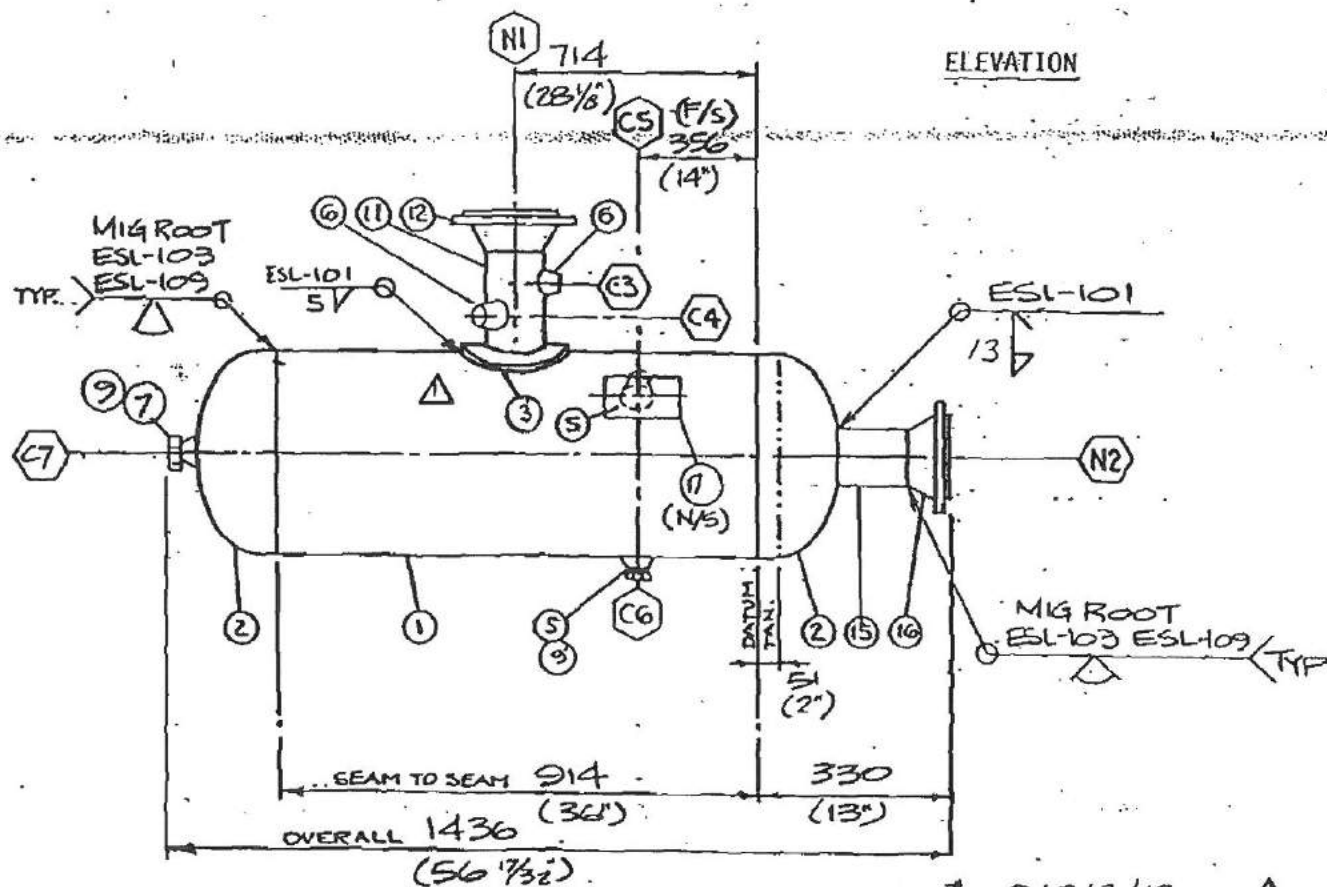
ORIENTATION:
As viewed from right end.

VESSEL TYPE: STG 2 DISCH
BOTTLE



SECTION "A"

ELEVATION



NOTE:
All dimensions in millimeters

JOB# 91012/13

DRAWING NUMBER A-VIII32

 $\frac{2}{3}$

MATERIAL LIST

NO.	QTY.	DESCRIPTION	MTR'S ☐ YES ☒ NO	MATERIAL	HEAT NUMBER
1.	1	12" NOM. SCH 100 SMLS. PIPE (.844") X 914 (36")		SA-106-B	
2.	2	3/8" NOM. 12 3/4" O.D. 2:1 S.E. HEAD 3/4" MIN WT 2" SF		SA 516-70N	
3.	1	3/8" NOM. PLATE X 4 1/2" I.D. 8 1/2" O.D. ROLLED REPAD		SA 516-70	
4.	-	NOM. PLATE X I.D. O.D. REPAD		SA 516-70	
5.	2	3/4" - 3000# THREDOLET (FOR 12" NOM. PIPE)		SA 105	
6.	2	3/4" - 3000# THREDOLET (FOR 4" NOM. PIPE)		SA 105	
7.	1	3/4" - 3000# THREDOLET (FLAT)		SA 105	
8.	-	3/4" - 3000# THREDOLET (FOR NOM. PIPE)		SA 105	
9.	2	3/4" NOM. HEXAGON HEAD PLUG		SA 105	
10.	-	2" NOM. HEXAGON HEAD PLUG		SA 105	
11.	1	4" NOM. SCH XXH SMLS. PIPE (.674") X 200 (7 1/2")		SA 106-B	
12.	1	4" 1500# RTJWN FLANGE SCH XXH BORE		SA 105	
13.	-	X NOM. SCH CONCENTRIC WELD REDUCER (X)		SA 234WPE	
14.	-	NOM. SCH WELD ELL ()		SA 234WPE	
15.	1	3" NOM. SCH XXH SMLS PIPE (.600") X 119 (4 1/2")		SA-106-B	
16.	1	3" 900# RTJWN FLANGE SCH XXH BORE		SA-105	
17.	1	1/8" X 5-1/2" FORMED CHANNEL. 1" X 5-1/2" LONG.		SA 36	

NOZZLE SCHEDULE

MK.	QTY.	SIZE	TYPE	RATING	MATERIAL	SCH.	SERVICE	INT. PROJ.	EXT. PROJ.	REPAD
N1	1	4"	RTJWN	1500#	SA-105	XXH	INLET	FLUSH	282 (11 1/2")	3/8" X 2"
N2	1	3"	RTJWN	900#	SA-105	XXH	OUTLET/INSP	FLUSH	330 (13")	-
C3	1	3/4"	TOL	3000#	SA 105	-	TEMP SENSOR	-	-	-
C4	1	3/4"	TOL	3000#	SA 105	-	TEMP INDICATOR	-	-	-
C5	1	3/4"	TOL	3000#	SA 105	-	PRES. TAP	-	-	-
C6	1	3/4"	TOL	3000#	SA 105	-	DRAIN	-	-	PLUG
C7	1	3/4"	TOL	3000#	SA 105	-	INSP/CLEANOUT	-	-	PLUG

Job # 910/2/13

VESSEL TYPE: STG 2 DISCH. BOTTLE

DWG. NO. A-VIII32

3/3

(rev. 17)

RENAISSANCE ENERGY LTD.

DATE: 01-30-1990

T.T. 4/4

ELL/MORCEN

9xkx4

OPINAC

9/0/2/13

***** DESIGN CONDITIONS *****

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c(1)

6.625 " N1 NOZZLE IN SHELL

reinforcement req'd

$$AR = 2.651$$
$$A1 = .694$$

A2= .506

UG-37

UG-40

$$A\mathbf{z} = 0$$

UG-45

$$A5 \approx 1.5$$

REPAD THICKNESS,.....	.375	13
FILLET WELD, nozzle to repad.....	.375 (4)	
FILLET WELD, repad to shell.....	.3125 (8)	
reinforcement available		

A41 = 121

UG-41

not used

UW-15

$$AT = 2.82$$

UW-16

6.625 " N2 NOZZLE IN SHELL

reinforcement req'd

AR= 2.651

$$A1 = .694$$
$$A_2 = .506$$

UG-37

UG-40

$$A_3 = 0$$

UB-45

$$A5 = 1.5$$

REPAD THICKNESS,.....	.375	13
FILLET WELD, nozzle to repad.....	.375 (10)	
FILLET WELD, repad to shell.....	.3125 (8)	
reinforcement available		

$$A_{41} = .121$$

UG-41

not used

UW-15

$$AT = 2.82$$

UW-1E

STAGE 1 SCRUBBER, 24 " O.D.

-continued-

***** NOZZLE DATA *****

REPAD ALLOWABLE STRESS,psi..... 17500

2.375 " N9 NOZZLE IN SHELL reinforcement req'd

AR= 0

A1= 0

A2= 0

A3= 0

UG-37

UG-40

UG-45

NOZZLE THICKNESS,nominal in..... .343

,minimum in..... .125

INTERNAL PROJECTION,used in..... 0

,maximum in..... 0

***** NO REPAD REQUIRED *****

FILLET WELD, NOZZLE IN SHELL..... .375 (10) A41= .121

reinforcement available AT = .121

UG-41

UW-15

UW-16

V E S S E L C A L C U L A T I O N S

(rev.19)

Construction in accordance with ASME code section VIII, Division I, 1989 edition, Addenda 1989.

OPINAC EXPLORATION LTD

SR# 91012/13

DATE: 02-26-1991

JLA *ML*

TAGE 1/2 SCRUBBER, 24 " O.D.

***** DESIGN CONDITIONS *****

DESIGN PRESSURE,psig(KPa).....	655 (4516)	
CORROSION ALLOWANCE,in.,(mm).....	.0625 (1.59)	
HELL ALLOWABLE STRESS,psi.....	17500	
HEAD ALLOWABLE STRESS,psi.....	17500	
JOINT EFFICIENCY.....	1	UW-12

***** CALCULATION RESULTS *****

SHELL THICKNESS,nominal in.....	.625	APPENDIX
,minimum in.....	.505	1-1.a.1
HEAD THICKNESS,nominal in.....	.625	APPENDIX
,minimum in.....	.568 497	1-4.c(1)

***** NOZZLE DATA *****

HEAD ALLOWABLE STRESS,psi.....	17500		
1.9 " DRAIN NOZZLE IN HEAD	reinforcement req'd	AR= 0	
		A1= 0	
NOZZLE THICKNESS,nominal in.....	.281	A2= 0	UG-37
,minimum in.....	.125		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	0		

***** NO REPAD REQUIRED *****

FILLET WELD, NOZZLE IN HEAD.....	¹³ .375 (.10)	A41= .121	UG-41
reinforcement available		AT = .121	UW-15
			UW-16

Gray-21)

CHECK

DATE: 03-18-1991

91016

BKF

***** DESIGN CONDITIONS *****

OK

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c (1)

EPAD ALLOWABLE STRESS,psi..... 17500

5.625 "	n1 NOZZLE IN SHELL	reinforcement req'd	AR= 2.021	
			A1= .99	
	NOZZLE THICKNESS,nominal in.....	.432	A2= .534	UG-37
	,minimum in.....	.205		UG-40
	INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
	,maximum in.....	.924		
	REPAD OUTSIDE DIAMETER, use.....	10.625		
	, max.....	11.772		
	REPAD THICKNESS,.....	.25	A5= 1	
	FILLET WELD,nozzle to repad.....	.375 (10)	A41= .141	UG-41
	FILLET WELD,repad to shell.....	.1875 (5)	not used	UW-15
	reinforcement available		AT = 2.664	UW-16

(Rev. 2-11)

CHECK

SR# 91001

DATE: 03-18-1991

BKF 111

***** DESIGN CONDITIONS *****

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.g (1)

EPAD ALLOWABLE STRESS,psi..... 17500

3.625 " n2 NOZZLE IN SHELL

reinforcement req'd

AR= 2.661

$$A1 = 1.303$$

A2= .646

UG-37

$$A\bar{B} = 0$$

UG-40

UG-45

$$AS = 1$$

54 42

REPAD THICKNESS,	1.25
------------------------	------

$$A_{41} = -141$$

FILLET WELD, nozzle to repad..... .375 (10)

not used

113-41

FILLET WELD, repad to shell.....	.1875 (5)
----------------------------------	-------------

AT = 3.08

114-15

reinforcement available

$$AT = 3.083$$

116-16

V E S S E L C A L C U L A T I O N S

(rev.22)

Construction in accordance with ASME code section VIII, Division I, 1989 edition, Addenda 1989.

CHECK

SR# 91001 41004/4/10/11 91002/13

DATE: 03-18-1991

BKF

PAGE 1 DISCHARGE BOTTLE, 14 " D.D.

***** DESIGN CONDITIONS *****

DESIGN PRESSURE,psig(KPa)..... 655 (4516)
 CORROSION ALLOWANCE,in.,(mm)..... .0625 (1.59)
 SHELL ALLOWABLE STRESS,psi..... 15000
 CAP ALLOWABLE STRESS,psi..... 15000
 JOINT EFFICIENCY..... 1

UW-12

***** CALCULATION RESULTS *****

SHELL THICKNESS,nominal in..... .5
 ,minimum in..... .363
 CAP THICKNESS,nominal in..... .5
 ,minimum in..... .357

APPENDIX
 1-1.a.1
 APPENDIX
 1-4.c(1)

***** NOZZLE DATA *****

REPAD ALLOWABLE STRESS,psi..... 17500
 1.5 " N2 NOZZLE IN CAP reinforcement req'd AR= .964
 A1= .265
 NOZZLE THICKNESS,nominal in..... .674 A2= .966
 ,minimum in..... .159
 INTERNAL PROJECTION,used in..... 0 A3= 0
 ,maximum in..... .938

UG-37
 UG-40
 UG-45

***** NO REPAD REQUIRED *****

FILLET WELD, NOZZLE IN CAP375 (10) A41= .141 UG-41
 reinforcement available AT = 1.371 UW-15
 UW-16

Construction in accordance with ASME code section VIII, Division I, 1989 edition, Addenda 1989.

CHECK
SR# 91001 9108/12/11 91012/13
DATE: 03-18-1991
BKF 12/1

***** DESIGN CONDITIONS *****

LW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c(1)

A1= .332
A2= .966 UG-37
UG-40
A3= 0 UG-45

FILLET WELD, NOZZLE IN SHELL..... .375 (10) A41= .141 UW-41
reinforcement available AT = 1.438 UW-15
UW-16

PAGE

GENERAL NOTES

1. Construction in accordance with ASME code section VIII, Division I, 1989 edition. AND 1989 ADDENDUM
2. Inspection by the Provincial Government Boiler Inspector - yes.
3. Design Pressure 655 psig @ 300 °F, corrosion allowance .0625 in.
4. Hydrostatic test at 983 psig (Ltd. by design).
5. Post weld heat treatment (stress relieved) 0 minutes at 1100°F.
6. RADIOGRAPHY - FULL-UW 11(a)-5(b).
7. Vessel to be cleaned & oiled internally.
8. All repads to have 1, 1/8" tell tale hole.
9. Qualified welding procedures registered WP-807.2.
(a) ESL-101 (b) ESL-103 (c) ESL-109 (d) ESL-101 for tack welds
10. Quality control program registered AQP(S)-1044/AQP-1111.
1. Length between tangents 69 1/2 in.
2. Length over all 94 in.
3. Seam to seam 65 1/2 in.
4. Capacity 16.47 FT³.
5. Vessel weight 1781 Lb.
6. Vessel sandblasted external
7. Ansi flanges are used unless
8. Vessel service is SWEET gas
9. No Charpy impact test required

SEE JOB # CS99665
FOR ORIGINAL VESSEL
DWG'S.

Year: 1991 NAME _____
CRN: _____
SN: 91012/13-C
MAWP 655
MINIMUM DESIGN PRESSURE _____
SH. THK. .625
SH. THK. 15.875
HD. THK. per MTR _____
HD. THK. per MTR _____

5 PSIG.



W
RT- 2

OILER'S BRANCH ACCEPTANCE STAMP

VESSEL TYPE: STAGE 1 SCRUBBER
D.P. 655 PSIG @ 300 °F
D.P. 4516 kPa @ 149 °C
SHELL DIA.: 24 " CA: .0625 "
CUSTOMER: OPINAC EXPLORATION LTD.
LOCATION: _____
LSD: _____

ENERFLEX SYSTEMS LTD.

Calgary 7720-48 Street S.E.

SR# 91012-13

DATE 91-03-06

REL'D BY _____

CHK'D BY _____

DWN BY _____

DWG. NO. _____

J.L.A. A-VIII27 1/3

[Signature]

[Signature]

CALCULATIONS

"Cakes!"

Construction in accordance with ASME code section VIII, Division I, 1989 edition. & 1983 ADDENDA

RENAISSANCE ENERGY LTD.

SR# 89092/3/4/5/6/7 & 90064/5/6

DATE: 01-30-1990

T. T.

ОРИНАТ

ELL / NORMAN

2004

OPINAC

91012/13

STAGE 1 SCRUBBER, 24 " O.D.

***** DESIGN CONDITIONS *****

DESIGN PRESSURE,psig(KPa).....	655 (4516)
CORROSION ALLOWANCE,in.,(mm).....	.0625 (1.59)
SHELL ALLOWABLE STRESS,psi.....	17500
HEAD ALLOWABLE STRESS,psi.....	17500
JOINT EFFICIENCY.....	1

UW-12

***** CALCULATION RESULTS *****

SHELL THICKNESS,	nominal	in.....	.625	APPENDIX
	,minimum	in.....	.505	1-1.a.1
HEAD THICKNESS,	nominal	in.....	.625	APPENDIX
	,minimum	in.....	.497	1-4.c(1)

***** NOZZLE DATA *****

REPAD ALLOWABLE STRESS,psi.....		17500		
6.625 " N1 NOZZLE IN SHELL		reinforcement req'd	AR= 2.651	
			A1= .694	
NOZZLE THICKNESS,nominal in.....	.432		A2= .506	UG-37
	,minimum in.....	.205		UG-40
INTERNAL PROJECTION,used in.....	0		A3= 0	UG-45
	,maximum in.....	.924		
REPAD OUTSIDE DIAMETER, use.....	10.625			
	, max.....	11.772		
REPAD THICKNESS,.....	.375		A5= 1.5	
		13		
FILLET WELD,nozzle to repad.....	.375 (40)		A41= .121	UG-41
FILLET WELD,repad to shell.....	.3125 (8)		not used	UW-15
	reinforcement available		AT = 2.82	UW-16

```
***** NOZZLE DATA *****
```

REPAD ALLOWABLE STRESS,psi.....		17500		
6.625 " N2 NOZZLE IN SHELL		reinforcement req'd	AR= 2.651	
			A1= .694	
NOZZLE THICKNESS,nominal in.....	.432		A2= .506	UG-37
	,minimum in.....	.205		UG-40
INTERNAL PROJECTION,used in.....	0		A3= 0	UG-45
	,maximum in.....	.924		
REPAD OUTSIDE DIAMETER, use.....	10.625			
	, max.....	11.772		
REPAD THICKNESS,.....	.375		A5= 1.5	
		13		
FILLET WELD,nozzle to repad.....	.375 (10)		A41= .121	UG-41
FILLET WELD,repad to shell.....	.3125 (8)		not used	UW-15
	reinforcement available		AT = 2.82	UW-16

STAGE 1 SCRUBBER, 24 " O.

-continued-

***** NOZZLE DATA *****

REPAD ALLOWABLE STRESS,psi..... 17500

.375 " N9 NOZZLE IN SHELL reinforcement req'd

AR= 0

A1= 0

A2= 0

A3= 0

UG-37

UG-40

UG-45

NOZZLE THICKNESS,nominal in..... .343

,minimum in..... .125

INTERNAL PROJECTION,used in..... 0

,maximum in..... 0

***** NO REPAD REQUIRED *****

FILLET WELD, NOZZLE IN SHELL..... .375 (10)
reinforcement available

A41= .121

AT = .121

UG-41

UG-15

UG-16

(rev. 17)

RENAISSANCE ENERGY LTD.

DATE: 01-30-1990

Y.Y

ELL/NORCEN

40104

9/10/12/13

***** DESIGN CONDITIONS *****

DESIGN PRESSURE,psig(KPa).....	655 (4516)
CORROSION ALLOWANCE,in.,(mm).....	.0625 (1.59)
SHELL ALLOWABLE STRESS,psi.....	17500
HEAD ALLOWABLE STRESS,psi.....	17500
JOINT EFFICIENCY.....	1

UW-12

***** CALCULATION RESULTS *****

SHELL THICKNESS,	nominal	in.....	.625		APPENDIX
	,minimum	in.....	.505		1-1.a.1
HEAD THICKNESS,	nominal	in.....	.625		APPENDIX
	,minimum	in.....	.497		1-4.c(1)

***** NOZZLE DATA *****

REFAD ALLOWABLE STRESS,psi.....	17500		
4.5 " N1 NOZZLE IN SHELL	reinforcement req'd	AR= 1.783	
		A1= .465	
NOZZLE THICKNESS,nominal in.....	.337	A2= .286	UG-37
,minimum in.....	.159		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	.686		
REFAD OUTSIDE DIAMETER, use.....	8.5		
, max.....	7.902		
REFAD THICKNESS,.....	.25	A5= .851	
FILLET WELD,nozzle to repad.....	.5 (¹⁶ .43)	A41= .214	UG-41
FILLET WELD,repad to shell.....	.1875 (5)	not used	UW-15
	reinforcement available	AT = 1.815	UW-16

```
***** NOZZLE DATA *****
```

REPAD ALLOWABLE STRESS,psi.....	17500		
4.5 " N2 NOZZLE IN SHELL	reinforcement req'd	AR= 1.783	
		A1= .465	
NOZZLE THICKNESS,nominal in.....	.337	A2= .286	UG-37
,minimum in.....	.159		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	.686		
REPAD OUTSIDE DIAMETER, use.....	8.5		
, max.....	7.902		
REPAD THICKNESS,.....	.25	A5= .831	
FILLET WELD,nozzle to repad.....	.5 (13)	A41= .214	UG-41
FILLET WELD,repad to shell.....	.1875 (5)	not used	UW-15
	reinforcement available	AT = 1.815	UW-16

(rev. 17)

AND 1985 APPENDIX

SR# 89092/3/4/5/6/7 & 90064/5/6

ВРИМЕТ

ELL/NOISE

90104

9/02/13

***** DESIGN CONDITIONS *****

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c(1)

$$AR = 3.1111$$
$$A_1 = .25$$

A2= -489

A2= .489 UG-37

$$A\mathbf{z} = \mathbf{0}$$

UG-40

UG-45

116-117

$$A5 = 2$$

1

$$A_{41} = .141$$

not used

$$AT = 3.77$$

HI = 2.22

$$AR = 2.731$$

A1 = .66

A1 = .66

$$A_2 = .482$$
$$A_2 = .482$$
$$A_3 = 0$$
$$A_3 = 0$$
$$AS = 1.6$$

75-1.2

$$A_{41} = .141$$

not used

$$AT = 2.78$$

BASE:

FALSE

(rev. 17)

RENAISSANCE ENERGY LTD.

DATE: 11-30-1989

MM

ELL/NORCEM

9/11/14

9/10/12/13

***** DESIGN CONDITIONS *****

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c(1)

8.625 " INLET N1 NOZZLE IN SHELL	reinforcement req'd	AR= 2.731	
		A1= .66	
NOZZLE THICKNESS,nominal in.....	.5	A2= .482	UG-37
,minimum in.....	.28		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	1.094		
REPAD OUTSIDE DIAMETER, use.....	12.625		
, max.....	15.5		
REPAD THICKNESS,.....	.375	A5= 1.5	
FILLET WELD,nozzle to repad.....	.375 (10)	A41= .141	UG-41
FILLET WELD,repad to shell.....	.3125 (8)	not used	UW-15
	reinforcement available	AT = 2.783	UW-15

4.5 " OUTLET N2 NOZZLE IN CAP	reinforcement req'd	AR= 1.126	
		A1= .307	
NOZZLE THICKNESS,nominal in.....	.674	A2= 1.09	UG-37
,minimum in.....	.176		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	1.094		

FILLET WELD, NOZZLE IN CAP375 (40) A41= .141 UW-15
reinforcement available AT = 1.538 UW-16

(rev. 17)

RENAISSANCE ENERGY LTD.

DATE: 11-30-1989

MM

ELL INGRASSI

9024

9/012/13

***** DESIGN CONDITIONS *****

UW-12

APPENDIX
1-1.a.1
APPENDIX
1-4.c (1)

4.5 " INLET N1 NOZZLE IN SHELL	reinforcement req'd	AR= 1.052	
		A1= .382	
NOZZLE THICKNESS,nominal in.....	.674	A2= 1.09	UG-37
,minimum in.....	.176		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	1.094		

FILLET WELD, NOZZLE IN SHELL..... .375 (10) A41= .141 UW-41
reinforcement available AT = 1.613 UW-15
UW-16

4.5 " OUTLET N2 NOZZLE IN SHELL	reinforcement req'd	AR= 1.052	
		A1= .382	
NOZZLE THICKNESS,nominal in.....	.674	A2= 1.09	UG-37
,minimum in.....	.176		UG-40
INTERNAL PROJECTION,used in.....	0	A3= 0	UG-45
,maximum in.....	1.094		

FILLET WELD, NOZZLE IN SHELL..... .375 (10) A41= .141 UW-41
reinforcement available AT = 1.613 UW-18

STAGE 2 SCRUBBER, 24 " O.D.

-continued-

***** NOZZLE DATA *****

REPAD ALLOWABLE STRESS,psi..... 17500

.375 " N9 NOZZLE IN SHELL reinforcement req'd

AR= 0

A1= 0

A2= 0

UG-37

NOZZLE THICKNESS,nominal in..... .343

,minimum in..... .125

UG-40

INTERNAL PROJECTION,used in..... 0

A3= 0

UG-45

,maximum in..... 0

***** NO REPAD REQUIRED *****

FILLET WELD, NOZZLE IN SHELL..... .375 (.10)

A41= .121

UG-41

reinforcement available

AT = .121

UW-15

UW-16

BILL OF MATERIAL

ITEM	SEC	QTY.	CODE No.	DESCRIPTION
201	05	1	BWK-13614	BALL VALVE, 1-1/2" NPT WKM B136-CS-02-CS-HL 2250# WDG RP WITH HANDLE
202	05	1	BWK-LD14	LATCHING DEVICE FOR 1-1/2" WKM B136 VALVE, WKM 242655
203	05	1	BSA-YSCS14	STRAINER, SARCO Y TYPE CS 1-1/2" NPT 1/32" SS SCREEN
204	05	1	BIR-810	AIR/GAS STARTER, IR SS810GB03R31 VANE TYPE INERTIA ENGAGEMENT
205	05	1	BIR-HDL2	LUBRICATOR, I.R. HDL-2
206	05	1	BWI-X02	OIL RESERVOIR, WILKERSON X02-04-F00 1/2" NPT
207	05	1	BIR-SRV150	GAS VALVE, 1-1/2" NPT IR SRV-150 ALUMINUM BODY 225 PSI MWP
208	05	1	BBH-1412	BRAIDED STEEL HOSE, 1-1/2" NPTM ENDS, 12' LONG
209	05	1	BBH-2012	BRAIDED STEEL HOSE, 2" NPTM ENDS, 12' LONG
210	16	1	BCV-P2S030	PI, CVS 2-1/2" DIAL LF 316 B. TUBE & SKT, PANEL MOUNT 1/4" NPTM, DUAL SCALE 0-300 PSI
211	05	2	NPN-1	PRESS. REG. FISHER 630 2" NPT, 3/16" DR IFICE SET @ 150 PSI
212	05	1	BME-8122	RELIEF VALVE, MERCER SERIES 8100 2" X 2" NPT (ORIFICE AREA = 0.472 SQ. IN.) SET AT 165 PSIG
225	05	1	BSA-YSCI20	STRAINER, SARCO Y TYPE CI 2" NPT 1/32" SS SCREEN
226	05	1	BAM-4418C3	GAS VALVE, 2" NPT AMOT 4418C6A6C 316 SS, 3 WAY, 600 PSI MWP, NACE
227	05	1	BBH-2012	BRAIDED STEEL HOSE, 2" NPTM ENDS, 12' LONG
228	05	1	BFI-51320	AIR/GAS ACTUATOR, FISHER 513-20, 3/4" TRIM 3-15 PSI
229	05	1	BEN-3901	ACTUATOR BRACKET FOR FISHER 513-20 ON LVHP GOVERNOR PER STD. DWG. 06.9301 (PAM-E79)
230	06	1	BAM-4057D	3-WAY VENT VALVE, AMOT 4057D022H1
231	06	1	BAS-B720B	IGNITION GROUND SWITCH, ASHCROFT B720B 1/2" NPT
232	06	1	BAM-2727C	FLOW CONTROL VALVE, AMOT 2727C 1/4" NPT
233	16	1	NPN-2	PI, CVS 2-1/2" DIAL LF 316B TUBE & SKT. PA NEL MOUNT 1/4" NPTM, DUAL SCALE 0-60 PSI
234	05	1	BBD-405N	PISTON CHECK VALVE, 1" NPT BONNEY HL-405 800# WDG CS
235	05	1	BNU-T310	BALL VALVE, 1" NPT NUTRON T3R10S20B 2000# WDG RP CS WITH HANDLE
236	05	1	BEN-FUL001	GAS FILTER, ESL 6-5/8" D. NPT CONN, 230 PSIG MWP DWG. W05.4001 (FUL-001) VI (1) KTOOL FG-24 ELEMENT
237	05	1	NPN-3	THERMAL RELIEF VALVE MERCER 1" X 1", 0.1100R IFICE, SET @ 165 PSIG
238	05	1	NPN-4	LEVEL GAUGE, PENBERTHY TX11 C/V 305 GAUGE CO CKS
239	05	1	BFI-R180530	PRESSURE RELIEF VALVE, FISHER 1805, SET @ 30 PSIG
240	05	2	BVH-2NVS	NEEDLE VALVE, WHITEY S-IVS4, 1/4" TUBE
241	05	1	BUE-H190	PRESSURE SWITCH, UE H100-190 NEMA 4 316SS DFM 5-30 PSI
242	05	1	BFI-627S325	REGULATOR, 1" NPT FISHER 627-553 C.S. 3/8" OR 15-40 PSI SPR, SET 25 PSI, 150-500 PSI SUPPLY
243	05	1	BVK-13620	BALL VAVLE, 2" NPT WKM B136-CS-02-CS-HL 2250# W.D.G., R.P. VI HANDLE.

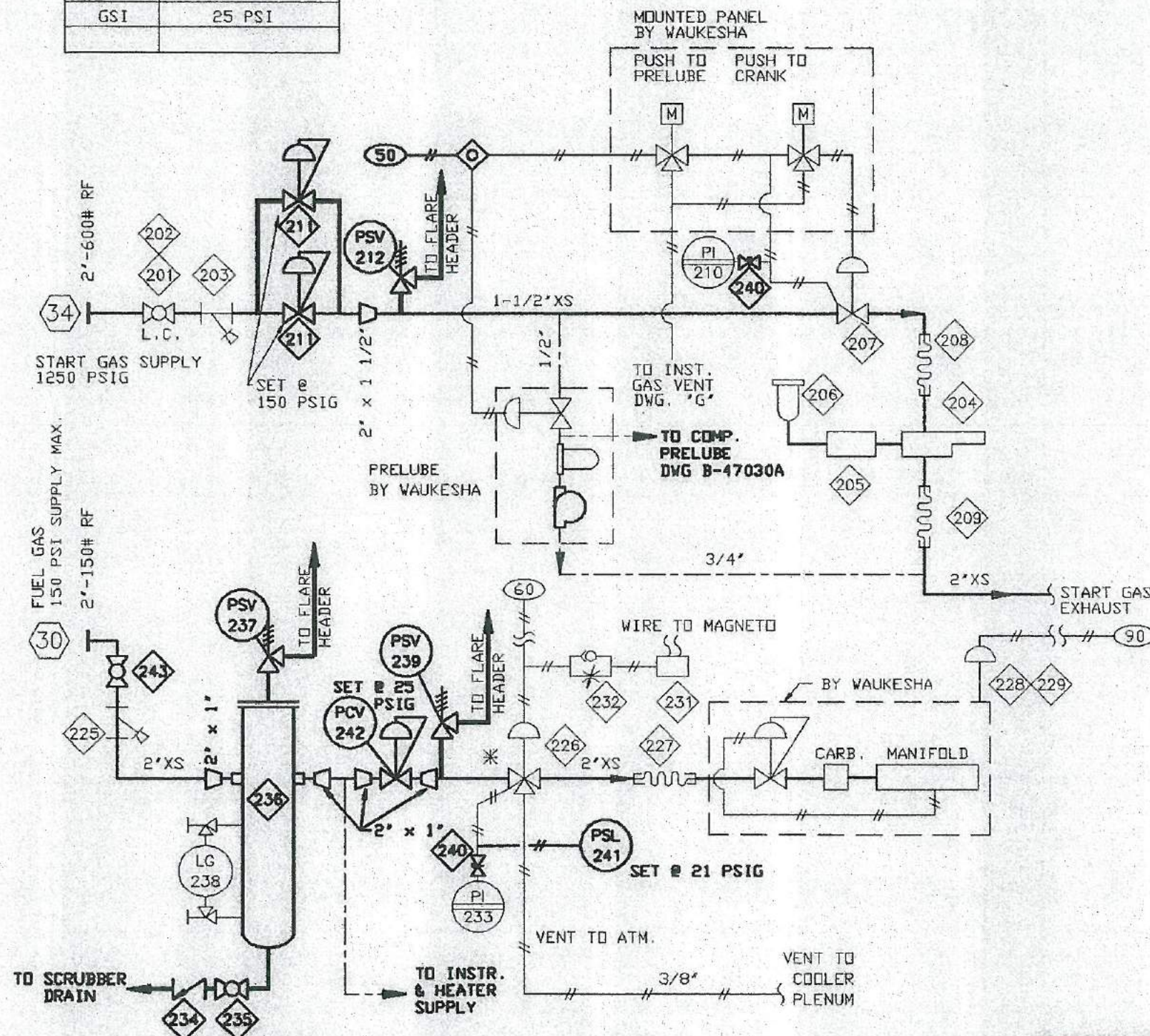
JUN 19 1991

SCHEMATIC
ENGINE EQUIPMENT AND CONTROLS
-FUEL AND START GAS SYSTEM

DWG. B-47030B

REV. 3

ENGINE	FUEL PRESSURE
GSI	25 PSI



ENGINE EQUIPMENT AND CONTROLS - FUEL & START GAS

CUSTOMER NOTE:

CUSTOMER IS RESPONSIBLE
FOR PRESSURE PROTECTION
UPSTREAM OF FUEL FILTER.

FILENAME:
B013.DWG

LAST DRAWING SAVE DATE:
19910618.1128

Enerflex
Systems Ltd.

CUSTOMER:
OPINAC EXPLORATION LTD.

JOB No.: 91012/13

CAD

MAKE NO REVISIONS
TO THIS REPRODUCIBLE

Rev.	Description	By	Date
3	AS-BUILT	J.L.A.91-06-18	
2	CHANGED ITEM 240 & ADDED FLG./BALL VALVE	J.L.A.91-04-11	
1	FOR CONSTRUCTION	J.L.A.91-04-03	
0	FOR APPROVAL	J.L.A.91-03-20	

DWN BY:	J.L.A.
DATE:	91-03-20
CHK'D BY:	2/12
DATE:	91-03-20