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FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required by the Provisions of the ASME Code Rules, Section VIII, Division 1

1. Manufactured and certified by FABSCO SHELL & TUBE, LLC., 2410 INDUSTRIAL ROAD, SAPULPA, OK 74066
(Name and address of Manufacturer)

2. Manufactured for Anadarko Petroleum Co, PO Box 4995, The Woodlands, TX 77387
(Name and address of Purchaser)

3. Location of installation AURORA, CO
(Name and address)

4. Type: HORIZ. HEAT EXCHANGER S12-10631-2
(Horiz., vert., or sphere) (Tank, separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.)

N/A S12-10631-2-1 7646 2013
(CRN) (Drawing No.) (Nat'l Bd. No.) (Year built)

5. ASME Code, Section VIII, Div. 1 2010 ED. 2011a ADD. N/A N/A
(Edition and Addenda (date)) (Code Case No.) (Special Service per UG-120(d))

Items 6-11 incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multichamber vessels.

6. Shell (a) No. of course(s): 3 (b) Overall length (ft & in.): 19'-8 5/8"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
	Diameter, in.	Length (ft & in.)		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
2	29" I.D.	8'-0"	SA-516-70	3/8"	1/16"	1	SPOT	0.85	1	SPOT	0.85	N/A	N/A
1	29" I.D.	3'-8 5/8"	SA-516-70	3/8"	1/16"	1	SPOT	0.85	1	SPOT	0.85	N/A	N/A
1	16" I.D.	0'-6"	SA-106B	3/8"	1/16"	1	SPOT	0.85	1	SPOT	0.85	N/A	N/A
1	15 1/4" 29"	1'-11 7/8"	SA-516-70	3/8"	1/16"	1	SPOT	0.85	1	SPOT	0.85	N/A	N/A

7. Heads: (a) SA-516-70N (b) ECCENTRIC CONE
(Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.) (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	END	5/16	1/16"	NA	NA	2:1	NA	NA	NA	NA	X	S	NONE	1.00
(b)	END	3/8	1/16"	NA	NA	NA	30°	NA	NA	NA	X	S	NONE	1.00

If removable, bolts used (describe other fastening) NA
(Mat'l Spec. No., Grade, size, No.)

8. Type of jacket NA Jacket closure NA
(Describe as ogee & weld, bar, etc.)

If bar, give dimensions NA If bolted, describe or sketch.

9. MAWP 250 NA psi at max. temp. 225 NA °F Min. design metal temp. -20 °F at 250 psi.
(internal) (external) (internal) (external)

10. Impact test NO, Exempt Per ug-20(f), ucs-66(a)(c), Fig ucs-66 General Note(c) & ucs-67 at test temperature of NA °F.
(Indicate yes or no and the component(s) impact tested)

11. Hydro. Test press. 325 Proof test NA

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-516-70N 20 3/16" 1 7/8" 0.2500" Bolted
(Stationary (Mat'l Spec. No.)) (Dia., in. (subject to press.)) (Nom. thk., in.) (Corr. Allow., in.) (Attachment (welded or bolted))

NA NA NA NA NA
(Floating (Mat'l Spec. No.)) (Dia., in.) (Nom. thk., in.) (Corr. Allow., in.) (Attachment)

13. Tubes: SA-179 3/4" 0.065" MIN. THK 76 "U"
(Mat'l Spec. No., Grade or Type) (O.D., in.) (Nom. thk., in. or gauge) (Number) (Type (Strait or U))

Items 14-18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 0'-8 5/16"

No.	Course(s)		Material Spec./Grade or Type	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
	Diameter, in.	Length (ft & in.)		Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	16"	8 5/16"	SA-106-B	0.3750"	1/8"	S	SPOT	0.85	1	SPOT	0.85	1175	1.00

15. Heads: (a) SA-516-70N H.T. @ 1175 deg F. for 1.00 Hours (b) NA
(Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.) (Mat'l Spec. No., Grade or Type) (H.T. - Time & Temp.)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	END	5/16	1/8"	NA	NA	2:1	NA	NA	NA	NA	X	S	NONE	1.00
(b)														

If removable, bolts used (describe other fastening) (20)3/4"Dia.SA-193B7 Studs W/SA-194-2H Heavy Hex Nuts
(Mat'l Spec. No., Grade, size, No.)

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16. MAWP 330 NA psi at max. temp. 450 NA °F Min. design metal temp. -20 °F at 330 psi.
(internal) (external) (internal) (external)

17. Impact test NO, Exempt Per ug-20(f), ucs-66(a)(c), Fig ucs-66 General Note(c) & ucs-67 at test temperature of NA °F.
(Indicate yes or no and the component(s) impact tested)

18. Hydro. Test press. 429 Proof test NA

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc.)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
INLET/OUTLET	1/1	6"-150#	RF-WN	SA-106-B	SA-105	0.4320"	1/16	NA	UW16.1	NONE, 0.70	NA
OUTLET	1	6"-150#	RF-WN	SA-106-B	SA-105	0.4320"	1/16	NA	UW16.1	NONE, 0.70	NA
LEVEL	1	2"-150#	RF-LWN	SA-105	SA-105	0.6250"	1/16	NA	UW16.1	NA	NA
LEVEL	1	2"-150#	RF-LWN	SA-105	SA-105	0.6250"	1/16	NA	UW16.1	NA	NA
DRAIN	1	1"-6000#	CPLG	SA-105	NA	6000#	1/16	NA	UW16.1	NA	NA
INLET	1	4"-300#	RF-WN	SA-106-B	SA-105	0.4380"	1/8"	NA	UW16.1	NONE, 0.70	NA
OUTLET	1	4"-300#	RF-WN	SA-106-B	SA-105	0.4380"	1/8"	NA	UW16.1	NONE, 0.70	NA

20. Supports: Skirt NO Lugs NONE Legs NONE Others (2) Saddles Attached Welded to Shell
(Yes or no) (No.) (No.) (Describe) (Where and how)

21. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
 (List the name of part, item number, mfg's. name and identifying number)
CYLINDER, ITEM #6, J & M WELDING, LLC., SN: 93273.1
ECCENTRIC CONE, ITEM #6, J & M WELDING, LLC., SN: 93186.1
CHANNEL, ITEM #14, J & M WELDING, LLC., SN: 93273.2

22. Remarks: SERVICE: Lean Amine/Refrigerant Exchanger ITEM NO.: G8-1005

STRAIGHT TUBE LENGTH 22'-0"

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements 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 Cessels, Section VIII, Division 1.

U Certificate of Authorization No. 30,112 Expires December 30, 2015

Date 8/7/13 Name FABSCO SHELL & TUBE, LLC. Signed Anthony Cadwell
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

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 Oklahoma and employed by OneCIS INSURANCE COMPANY of LYNN, MA have inspected the pressure vessel described in this Manufacturer's Data Report on 1/9/13, 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 8/12/13 Signed Mark Staught Commissions NB 7935A OK657
(Authorized Inspector) (Nat'l Board incl. endorsements, State, Province, and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1. U Certificate of Authorization No. _____ Expires _____, 20____

Date _____ Name _____ Signed _____
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

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 _____ and employed by _____, have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to hydrostatic test of _____ psi. 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 _____ Signed _____ Commissions _____
(Authorized Inspector) (Nat'l Board incl. endorsements, State, Province, and No.)

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)
A Part of a Pressure Vessel Fabricated by One Manufacturer for Another Manufacturer
As Required by the Provisions of the ASME Boiler and Pressure Vessel Code Rules, Section VIII, Division 1

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1. Manufactured and certified by J & M Welding, LLC, 7862 South Regency Dr., Tulsa, Oklahoma 74131
(Name and address of Manufacturer)

2. Manufactured for FABSCO Shell and Tube, 2410 Industrial Road, Sapulpa, OK 74066
(Name and address of Purchaser)

3. Location of installation "Unknown"
(Name and address)

4. Type: Rolled & Welded Cone 93186.1
[Description of vessel part (shell, two-piece head, tube bundle)] (Manufacturer's serial number) (CRN)

T12-10631-2WLD FABSCO Shell and Tube 2012
(National Board number) (Drawing number) (Drawing prepared by) (Year built)

5. ASME Code Section VIII Div 1 2010/2011a
(Edition and Addenda (date)) (Code Case number) [Special Service per UG-120(d)]

6. Shell (a) No. of course (s): 1 (b) Overall Length: 1'11-7/8"

No.	Course(s)		Material		Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B, & C)			Heat Treatment	
	Diameter	Length	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time	
1	1'3-1/4" ID x 2'5" ID	1'11-7/8"	SA 516 70	3/8"	0	1	Spot	85	-	-	-	-	-	

7. Heads: (a) N/A (b) N/A
(Material spec. number, grade or type) (H.T. - time & temp)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.
(a)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
(b)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

If removable, bolts used (describe other fastenings) N/A
(Material spec. number, grade, size, number)

8. MAWP at max temp. Min. design metal temp. at
(Internal) (External) (Internal) (External)

9. Impact Test NO. EXEMPT UG-20(f), UCS-66. at test temperature of
Indicate yes or no and the component(s) Impact tested

10. Hydro., pneu., or comb. test press. NONE Proof Test

11. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
N/A											

12. Identification of parts

Name of Part	Quantity	Line No.	Mfr's Identification No.	Mfr's Drawing no.	CRN	National Board No.	Year Built
N/A							

13. Supports: Skirt NO Lugs Legs Others Attached
(Yes or No) (Number) (Number) (Describe) (Where and how)

14. Remarks No design by J & M Welding, LLC.
WPS QUALIFIED IN PWHT & NO PWHT CONDITIONS.

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of material, construction and workmanship of this pressure vessel part conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization No. 41,929 Expires 07/18/2014

Date 10/24/12 Name J & M Welding, LLC Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

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 OKLAHOMA and employed by OneBeacon America Insurance Company of Lynn, Ma.

have inspected the pressure vessel part described in this Manufacturer's Data Report on 10/24/12 and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel part described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her 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 10/24/12 Signed Michael V. Pope Commissions AB9205A
(Authorized Inspector) (National Board (incl endorsements) State, Province and number)

Form U-2 (Back)

15. Heads: (a) SA516GR70 (b) _____
(Material spec. number, grade or type) (H.T. - time & temp) (Material spec. number, grade or type) (H.T. - time & temp)

	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff
(a)	END	5/16"	N/A			2:1				X		1	SPOT	
(b)														

If removable, bolts used (describe other fastenings) _____
(Material spec. number grade, size, number)

16. MAWP _____ psi at max temp. _____ Min. design metal temp. _____ at _____ psi
(Internal) (External) (Internal) (External)

17. Impact test _____ at test temperature of _____
[Indicate yes or no and the component(s) impact tested]

18. Hydro., pneu., or comb. test press. _____ Proof Test _____

19. Nozzles, inspection, and safety valve openings:

Purpose (Inlet, Outlet, Drain, etc)	No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr		Nozzle	Flange	
INLET	2	4"-150#	RFWN	SA-106B	SA105	SCH XH	N/A	N/A	UW16.1(a)	UW16.1(a)	

20. Identification of Parts:

Name of Part	Quantity	Line No.	Mfr's Identification No.	Mfr's Drawing No.	CRN	National Board No.	Year Built

21. Supports: Skirt NO Lugs YES Legs - Others Attached WELD/SHELL
(Yes or No) (No.) (No.) (Describe) (Where and how)

22. Remarks IMPACT TESTING EXEMPT PER UG-20(F)

**NO DESIGN BY J&M WELDING, LLC
WPS QUALIFIED WITH AND WITHOUT PWHT.**

CERTIFICATE OF SHOP/FIELD COMPLIANCE

We certify that the statements made in this report are correct and that all details of material, construction and workmanship of this pressure vessel part conform to the ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1.

U Certificate of Authorization Number 41,929 Expires 07/18/2014

Date 4/28/13 Name J&M Welding, LLC Signed [Signature]
(Manufacturer) (Representative)

CERTIFICATE OF SHOP/FIELD INSPECTION

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 OKLAHOMA and employed by OneBeacon America Insurance Company of Lynn, Ma. have inspected the pressure vessel part described in this Manufacturer's Data Report on 12/20/12 and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel part in accordance with ASME BOILER AND PRESSURE VESSEL CODE, Section VIII, Division 1. By signing this certificate neither the Inspector nor his/her employer makes any warranty, expressed or implied, concerning the pressure vessel part described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his/her 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 4/28/13 Signed Michael R. Pope Commissions NB9265-A
(Authorized Inspector) [National Board (incl endorsements) State, Province and number]