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 Hughes-Anderson Heat Exchangers, Inc. , 1001 North Fulton, Tulsa, Oklahoma 74115
(Name and address of Manufacturer)

2. Manufactured for WorleyParsons Group, Inc., 181 W. Huntington Drive, Monrovia, CA 91016
(Name and address of Purchaser)

3. Location of installation BP Exploration Alaska, Prudhoe Bay, AK
(Name and address)

4. Type: Horizontal (Horiz., vert., or sphere) | Heat Exchanger (Tank, separator, jkt. vessel, heat exh., etc.) | 9683-2 (Mfg's serial No.) | (CRN) | 9683-01 (REV 5) (Drawing No.) | 6007 (Nat'l Bd. No.) | 2008 (Year built)

5. ASME Code, Section VIII, Div. 1 2004 ED, 2006 ADD (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 multi-chamber vessels.

6. Shell (a) No. of course(s): 3 (b) Overall length (ft & in) 25'-6 3/16"

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	52 3/8" ID	9'-11 1/2"	SA-516-70N	1 1/8"	1/8"	1	SPOT	85	1B	SPOT	85		
1	52 3/8" ID	6'-0 11/16"	SA-516-70N	1 1/8"	1/8"	1	SPOT	85	1B	SPOT	85		
1	52 3/8" ID	9'-6"	SA-516-70N	1 1/8"	1/8"	1	SPOT	85	1B	SPOT	85		

7. Heads: (a) SA-516-70N (Mat'l Spec. No., Grade or Type) H.T. – Time & Temp (b) SA-516-70N (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	1 1/16"	1/8"			2:1					X			
(b)	SH CVR CYL	1 1/8"	1/8"	52 3/8"	x 12 15/16"	LG	R&W	CYL				1	SPOT	85

If removable, bolts used (describe other fastening) SA-320-L7, 1 3/8" DIA, 52; SA-194-7, 1 3/8" HEX, 104
(Mat'l Spec. No., Grade, size, No.)

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

If bar, give dimensions (If bolted, describe or sketch.)

9. MAWP 600 (internal) FV (external) psi at max. temp. 400 (internal) 400 (external) °F Min. design metal temp. -50 °F at 600/FV psi.

10. Impact test YES, IMPACT TEST SHELL HEAD, CYLINDERS & NOZ. REINF. PADS (Indicate yes or no and the component(s) impact tested) at test temperature of -50 °F

11. Hydro., ~~####.~~, ~~#######~~ test press. 789 Proof test

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-266-4N (Stationary (Mat'l Spec. No.)) | 55 1/2" (Dia., in. (subject to press.)) | 5 5/8" (Nom. Thk., in.) | .125" (Corr. Allow., in.) | BOLTED (Attachment (welded or bolted))

SA-266-4N (Floating (Mat'l Spec. No.)) | 52" (Dia., in.) | 5 5/8" (Nom. Thk., in.) | .125" (Corr. Allow., in.) | BOLTED (Attachment)

13. Tubes: SA-334-6 (Mat'l Spec. No. Grade or Type) | 1" (O.D., in.) | 12 BWG (MIN) (Nom. thk., in. or gauge) | 989 (Number) | STRAIGHT (Type (Straight 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) 2'-2 1/16"

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	52 3/8" ID	2'-2 1/16"	SA-516-70N	1"	1/8"	1	SPOT	85	1B	SPOT	85	1150	1 HR

15. Heads: (a) SA-266-4N, H.T. 1 HR @ 1150°F (Mat'l Spec. No., Grade or Type) H.T. – Time & Temp (b) SA-516-70N, H.T. 2 1/4 HRS @ 1150°F (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 5/16"	1/8"						54.0126"					
(b)	FLTG HD CVR	45 7/8"	1/8"					45 7/8" DR		X				

If removable, bolts used (describe other fastening) SA-320-L7, 1 1/4", 60; SA-194-7, 1 1/4" HEX, 120; SA-320-L7M, 1 1/4", 52; SA-194-7M, 1 1/4" HEX, 104
(Mat'l Spec. No., Grade, size, No.)

16. MAWP 500 (internal) FV (external) psi at max. temp. 400 (internal) 400 (external) °F Min. design metal temp. -50 °F at 500/FV psi.

17. Impact test YES, IMPACT TEST FLTG HD., CHAN CVR., TUBESHEETS, CHAN. CYL. & NOZ. REINF PADS at test temperature of -50 °F
(Indicate yes or no and the component(s) impact tested)

18. Hydro., ~~pneu. pneumatic~~ test press. 679 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/OUTLET	1/1	14"	300# WN	SA-333-6	SA-350-LF2CL1	SCH-60	1/8"	SA-516-70N	X	XX	CHANNEL
INLET/OUTLET	1/1	10"	300# WN	SA-333-6	SA-350-LF2CL1	SCH-80	1/8"	SA-516-70N	X	XX	SHELL
VENT	1	2"	300#LWN	SA-350-LF2CL1		.656"	1/8"		X		SHELL
VENT/DRAIN	1/1	2"	300#LWN	SA-350-LF2CL1		.656"	1/8"		X		CHAN NOZ'S
DRAIN	1	2"	300#LWN	SA-350-LF2CL1		.656"	1/8"		X		SHELL OUT NOZ

20. Supports: Skirt (Yes or No) Lugs (No.) Legs (No.) Others (2) SADDLES (Describe) Attached WELDED TO SHELL (Where and How)

21. Manufacture'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)

22. Remarks: (X) UW-16.1(d); (XX) CAT.C TP1; SERVICE: PRODUCTION HEATER; TYPE: AET; SIZE: 52" x 28';
ITEM NO.: EST-Z6011 B; CHAN FLG @ CVR = 5 5/8" THK; CHAN FLG @ SHELL = 6 1/2" THK; SHELL FLG @ CHAN = 6 3/16" THK;
SHELL FLG @ SHELL CVR = 5 7/8" THK; SHELL CVR FLG = 6 1/16" THK; ALL GIRTH FLG MATL = SA-350-LF2-CL1; RELIEF DEVICES TO
BE INSTALLED PER UG-125(a);

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1,
U Certificate of Authorization No. 11979 Expires 01/27/2009

Date 8-11-08 Name Hughes Anderson Heat Exchangers, Inc. (Manufacturer) Signed Roger Matthews (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and the State or Province of OKLA and employed by OneBeacon America Insurance Company of Lynn, Mass have inspected the pressure vessel described in this Manufacturer's Data Report on Aug 12, 2008, 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 the 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 Aug 12, 2008 Signed (Authorized Inspector) Commissions N.B. #5298-A-B, Okla #258 (Nat'l Board incl. endorsement, State, Province and No.)

CIS 22

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the 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

Date Name (Assembler) Signed (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 the State or Province of and employed by of 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 subject to a 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 (Authorized Inspector) Commissions (Nat'l Board incl. endorsement, State, Province and No.)