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Project Data List Rev 0
Work Order: 11629-003-004
P&ID: 11629-003-P-000 Rev 0

December 12, 2023

NWP Project Manager : Spencer Wiley (NWP Industries LP)

Sales Rep : House Account **NWP Quote Reference**:

Client: NWP Stock

P.O.:

New, 36" Vertical Separator Package, Sour

GENERAL DESCRIPTION

Quantity	Description
1	**3-Phase, Sour Service, Wellhead Separator Package, New**

- 36” x 10’ 0” 1405-PSI MAWP Separator
- 4” 600 ANSI RF welded inlet and gas outlet piping
- Dressed three phase
- Ex Works: NWP Industries Innisfail, Alberta

1.0 VESSEL - SEPARATOR

1.1 GENERAL DESCRIPTION

Tag #: V-1610

- 36” OD x 10’ 0” SM/SM
- 3 Phase Vertical design
- 1405-PSIG MAWP / Full Vacuum
- Sour Service c/w RT-1 (Full) Radiography (Long seam and circ seams)
- 158°F Design Temperature
- CRN: A.B., B.C., SASK,
- M.D.M.T. -20 F @ 1405 PSIG
- 1/8” C.A.
- Inlet Deflector (45° Elbow 6” NPS, SA-234-WPB)
- (1) Vortex Breaker
- 6” thick x 9 lb³ft Mistex 316SS
- Skirt SA516-70N and baseplate SA36/44W
- Baffle Plate SA-36
- Shell and Heads: SA-516-70N, 1-1/2” thick
- Flanges: SA-350-LF2-CL1
- Pipe: SA-106-B
- Fittings: SA-234-WPB

1.2 VESSEL CONNECTIONS

N1	**Inlet:**	6” NPS 600# RF c/w Inlet Deflector
N2	**Gas Outlet:**	6” NPS 600# RF
N3	**PSV:**	2” NPS 600# RF
N4	**Oil LLC:**	3” NPS 600# RF
N5	**Water LLC:**	3” NPS 600# RF
N6	**Oil Out:**	2” NPS 600# RF
N7	**Water Out:**	2” NPS 600# RF
N8	**Drain:**	2” NPS 600# RF c/w Vortex Breaker
N9	**HLSD:**	3” NPS 600# RF
N10a/b	**Inspection:**	3” NPS 600# RF
N11a/b	**Oil LG:**	2” NPS 600# RF
N12a/b	**Water LG:**	2” NPS 600# RF
N13	**Pressure Indicator:**	2” NPS 600# RF
N14	**Temperature Indicator:**	2” NPS 600# RF

2.0 PIPING

Separators are packaged for 3 phase service as follows:
Design & Fabricate to: ASME / ANSI B31.3 Normal Fluid Service
Piping Corrosion Allowance: 1/8”

- Sour Service c/w 100% BW Radiography
- 158°F Design Temperature
- M.D.M.T. -20 F @ 1405 PSIG
- 1/8” C.A.
- Fabricated to ASME B31.3 NFS

- Inlet - 4” ANSI 600# RF flanged welded pipe, Sch 80, skid edge connection, enlarged to 6” at vessel Inlet.
- Gas Outlet – 6” ANSI 600# RF flanged welded pipe, Sch 80, reduced to 4” ANSI 600# RF to meter run. Piping at BP Control Valve to be reduced to 3” ANSI 600# RF, 4” ANSI 600# RF to skid edge.
    - Includes a ½” TOL for a HPV, 1” TOL for a Sample Point, ½” TOL for a PIT, ½” TOL for a chemical injection connection, ½” TOL for a LPD, and a 2” ANSI 600# Blind Flange Connection
- Water Outlet - 2” ANSI 600# RF flanged welded pipe, Sch 160, to skid edge and reinjects to Gas Out Line.
    - Includes a 2” 600# flanged blind connection for future drain reinjection point.
- Water Provers - 2” ANSI 600# RF flanged welded pipe, Sch 160, outside building.
- Oil Outlet – 2” ANSI 600# RF flanged welded pipe, Sch 160, to skid edge and reinjects to Gas Out Line.
    - Includes a 2” 600# flanged blind connection for future drain reinjection point.
- Oil Provers - 2” ANSI 600# RF flanged welded pipe, Sch 160, outside building.
- Drain – 2” ANSI 600# RF flanged welded pipe, Sch 160, to skid edge.
    - Includes a 2” 600# flanged blind connection for future water/oil drain reinjection point and a ¾” TOL for future Fuel Gas Scrubber drain.
- Relief Piping (PSV-1610) – 2” ANSI 600# RF flanged nozzle, Sch 160, reduced to 1.5” ANSI 600# RF at relief valve. 4” ANSI 150# RF Sch Std to Skid Edge.
- Sweet Fuel Gas In – 1” 3000# Skid edge connection to regulators.
- Instrument Air In – 1” 3000# Skid edge connection to regulators
- Oil & Water Y strainers and Sight Glass Drains tubed to Drain Line
- All connections exiting building to be of “low temp” material up to first fitting inside building unless otherwise noted.

3.0 INSTRUMENTATION

Tag #	Quantity	Description
BH-1680/1685	**(2)**	**Building Heater – CCI Thermal Technologies** Catadyne 18” x 24” Building Heater, WX Series Back Mount, 12V DC Start, Natural Gas Fuel supply C/w Safety shut off, 912 Regulator, Thermocouple, Grill Guard, Vent Hood, thermostat 30’ 12V Start Up Cables Gas Permit pulled per B149
BPCV/PY/PI-1650 **PRV/PI-1651**	**(1)**	**Control Valve – CVS** 3" 600#RF CVS Series E Control Valve, Equal %, LCC Body, NACE. c/w CVS Series 667-45 ATO/Fail CLOSE Actuator14-30 psi Bench Set, 1 1/2" Travel c/w **Fisher I2P-100, I/P Transducer**, 4-20mA Input, 6-30PSI Output, CSA Approved. **CVS670FGV Auto-manual Loading Station** Model CVS670FGV, 0-60 psi Auto / Manual w/ Hand wheel c/w CVS67CFR Airset Filter Regulator
FE-1650	**(1)**	**Meter Run – Canalta Dual Chamber (“Senior”)** 460RFDC80SSAW00WFTT2_QBA9-FF-CB-N-PX DUAL CHAMBER W/ RUN, 4" 600, SCH80, 3PC

SS Internals, Grease Seat, 600 WxF
Teletaps
AGA 3 2016 Ed., A216WCB (NACE)
O-PLT 4"x1/8" 2.000" 316SS
Teflon - Snap Style, 00Ed.
Pipe: Cold Drawn, A106B-A333GR6-API5LX42 / A105N, OAL:91"
Dual Hand
AGA 2016
Upstream: 600RF, Downstream: 600RF
Contour Flow Cond.: RF
Outlets: 1"TOL, 0.75"TOL
Treatments: Weld Radiography (100%),
Includes Hydro Test, MTR's, Canalta Inspection
Canalta Standard Paint

FE/FQIT-1610 **(1)** **Turbine Meter – NuFlo Model 9A-100003551**
2” ANSI 600# RF Ez-In Style
NUFLO LIQUID EZ-IN RF METER
Fluid Type: Liquid
End Connection Type: [EF] EZ-IN Raised Face
Series: [NF] NuFlo
Certification: CSA Explosion Proof
Model/Bore Size/Flowrate: [L01] 2", 1300-13000 BPD
End Connection Size: 2 Inch
Body Material: 316 SS
Rotor Material: CD4MCU
Internals/Bearings: Standard
Linearity (Grade): +/- 1.00%
Conduit Connections: 1 - Standard
Operating Temperature Range: -20F to 250F

9A-100003556-NACE
HARDWARE INSTALLATION KIT (NACE)
2" 300 / 600 ANSI KIT FOR EZ-IN TURBINES
Kit includes gaskets, centering rings, nuts, studs & pickup adapter extension

Pick Up Flow Meter, Model: 9A-100002077
For use with 7/8” and larger Flow Meters
Temperature Range -67 to 250 DEG. F

MC-III Totalizer, Model: 9A-50179024
Type: Direct mount turbine totalizer
Classification: CSA Explosion proof, Class 1, Division 1, Groups B,C &D.
LCD display: Total and rate.
(4) Outputs:
- 4 to 20 mA loop
- Scaled open-collector pulse output
- Turbine meter frequency
- Modbus RS-485

Power options: One D-size lithium battery or 8.5 to 30 VDC or loop-powered.
Operating Temperature: - 40 C to 70 C (electronics)
PC interface software included

FE/FQIT-1611	**(1)**	**Turbine Meter – NuFlo Model 9A-100005095** 2” ANSI 600# RF Ez-In Style NUFLO LIQUID EZ-IN RF METER Fluid Type: Liquid End Connection Type: [EF] EZ-IN Raised Face Series: [NF] NuFlo Certification: CSA Explosion Proof Model/Bore Size/Flowrate: [L01] 1-1/2", 15-180 USGPM End Connection Size: 2 Inch Body Material: 316 SS Rotor Material: CD4MCU Internals/Bearings: Standard Linearity (Grade): +/- 1.00% Conduit Connections: 1 - Standard Operating Temperature Range: -20F to 250F **9A-100003556-NACE** HARDWARE INSTALLATION KIT (NACE) 2" 300 / 600 ANSI KIT FOR EZ-IN TURBINES Kit includes gaskets, centering rings, nuts, studs & pickup adapter extension **Pick Up Flow Meter, Model: 9A-100002077** For use with 7/8” and larger Flow Meters Temperature Range -67 to 250 DEG. F **MC-III Totalizer, Model: 9A-50179024** Type: Direct mount turbine totalizer Classification: CSA Explosion proof, Class 1, Division 1, Groups B,C &D. LCD display: Total and rate. (4) Outputs: - 4 to 20 mA loop - Scaled open-collector pulse output - Turbine meter frequency - Modbus RS-485 Power options: One D-size lithium battery or 8.5 to 30 VDC or loop-powered. Operating Temperature: - 40 C to 70 C (electronics) PC interface software included
LC-1610	**(1)**	**Level Controller – Norriseal** 1001A 2" NPT, L.H.Mount, Envirosave Pilot, Direct, c/w 1-7/8" x 12" PVC Vertical Displacer. Sour Process/Sweet Instrument
LC-1611	**(1)**	**Level Controller – Norriseal** 1001A 2" NPT, L.H.Mount, Envirosave Pilot, Direct, c/w 1-7/8" x 12" PVC Vertical Displacer. Sour Process/Sweet Instrument
LCV-1610	**(1)**	**Liquid Control Valve – Norriseal** Model# 2-2220RFP14TGNN12HA - 2" 600 RF

		- 1" TC Trim, FC, - Sour Proc./Sweet Ins
LCV-1611	**(1)**	**Liquid Control Valve – Norriseal** Model# 2-2220RFP14TGNN12HA - 2" 600 RF - 1" TC Trim, FC, - Sour Proc./Sweet Ins
LG-1610	**(1)**	**Level Gauge – Daniel QTS** **Transparent** Liquid Level Gage Model# 71TH NACE - 3000 PSI @ 100°F/ 11-3/4" OAL / 10-1/4" VIS /15" C-C c/w 1S Gauge Valve Set - 4000 PSI @ 100°F OFFSET GAUGE VALVES - SCREWED, A105 W/ 316SS TRIM
LG-1611	**(1)**	**Level Gauge – Daniel QTS** **Reflex** Liquid Level Gage Model# 71RH NACE - 4000 PSI @ 100°F/ 11-3/4" OAL / 10-1/4" VIS /15" C-C c/w 1S Gauge Valve Set - 4000 PSI @ 100°F OFFSET GAUGE VALVES - SCREWED, A105 W/ 316SS TRIM
LSHH-1610	**(1)**	**Level Switch – Norriseal** Level Switch ELECTRIC, Model # 1005E-1018-NKVSU 2" NPT, 316 SST. Float NACE Service Viton O-Rings SPDT Switch 0.61 SG w/ Standard Counterbalance 0.625” Extension, 1.5” Float
PI-1610	**(1)**	**Pressure Gauge – Wika Model 233.54** 4” face x ½” NPT end connection 0 to 1500 PSIG range, dual scale Liquid filled, 316 SS internals Lower Bottom Mount
PI-1660	**(1)**	**Pressure Gauge – Wika Model 233.53** 2-1/2” face x ¼” NPT end connection 0 to 300 PSIG range, dual scale Liquid filled, 316 SS internals
PRV/PI-1610/1611 1652	**(3)**	**Instrument Air Regulator – CVS 67CFR** ¼” FNPT connections 0 to 60 PSIG spring range 250 PSIG Max Inlet Std service c/w Pressure Indicator
PSV-1610	**(1)**	**Pressure Relief Valve - Mercer** Model# 91-35F11T23NX1 1.5" 600# RF x 2" 150# RF F Orifice, PTFE Seat, FKM/Buna Seals

PRESSURE SET @ 1405PSIG

SP-1651/1652	**(2)**	**Sample Point – Welker** 1” NPT x 10” cut to length, Model SP-2 c/w 1/4” NPT Needle Valve
TI-1610 **TW-1610**	**(1)**	**Temperature Indicator – Wika/Trend** ½” NPT back connection 3” dial, 12” stem 0 to 250°F range - Dual scale **Thermowell:** ½” FNPT x 1” MNPT x 12” 316 SST
MVS/TE/TW-1650	**(1)**	**MVS w/ 5-Way Manifold w/ RTD - Rosemount 4088BMultiVariable Transmitter** Model# 4088B2P12G4R3E131AE6M5 4088: MultiVariable Pressure Transmitter B: Transmitter Register Mapping: Remote Automation Systems Ready 2: Performance Class: Classic: 0.10% DP Accuracy P: MultiVariable Measurement with Direct Process Variable Output 1: Measurement Type: Differential Pressure, Static Pressure, and Temperature 2: Differential Pressure: -250 to 250 inH2O (-623 to 623 mbar) G: Static Pressure Type: Gage 4: Static Pressure Range: 3626 psi Measurement Type 1&2 only; R: Temperature Input: RTD Input 3: Isolating Diaphragm: Alloy C-276 E13: Process Connection: Coplanar flange 18 NPT Cast C-276 Alloy C-276 Drain Vents 1A: Aluminum housing -14 NPT E6: CSA Explosion-proof, Dust Ignition-proof, Division 2 M5: LCD Display **RTD ASSEMBLY, AIRCOM RT7** **Model: RT7-2ALT-NUN-3.5-A-S-3-LT-4.5-14** C1D1 RTD Assembly; 2ALT Head; NUN, 3.5”; 100Ω Pt; Single; 3 Wire; LT; 4.5” L; 1/4” OD c/w Threaded Tapered TW; S24-1-316-3, 0.260” Bore; 1” NPT; 316 SS; 3” U; 1.75” H; 4.5” Stem 5TIS-4FLG-CS-KIT 316SST **5-WAY** MANIFOLD KIT (NACE) C/W BRACKET & 4 BOLTS Model: 5TIS-4FLG1 5 WAY MANIFOLD - FLANGE X 1/2" FNPT NACE HEAVY DUTY MOUNTING BRACKET FOR MANIFOLD

Note: All instrumentation requires sweet fuel gas / instrument air.

4.0 SKID / BUILDING

S-1600 **(1)** **Wide Flange Skid**

- 8-feet-0-inch wide, 19-feet-0-inch (approx.) long
- Main skid members 8" @ 18# Wide Flange
- 3/16" Checkerplate (Building Area)
- (4) Lift Lugs
- 2" Drip Lip around building perimeter.
- 8" Circular floor drain piped to skid edge with 2" ball valve
- Fabricated to CWB specifications.
- 2" Thick Underskid foam insulation

B-1600 **(1)** **Foam Panel Building**

8' – 0" wide, 19-0" long
13'- 2" Low Eave to 14" – 0" High Eave
Shed Style Roof
Galvalume Interior / **Galvalume** Exterior
1 – 3' x 7' panel single door c/w IWG, panic, check chain and weather strip
1-1/2" polyurethane foam panel construction, R12
1 – Sniffer Port 5" Dia
2 - 12" x 12" manually adjustable louvers
1 – 36" x 36" Fixed Window
Icerake Galvalume on Low Eave

5.0 FUEL GAS

No Fuel Gas Scrubber or associated instrumentation provided.

6.0 MANUAL VALVES

BF038 **(2)** **Ball Valve,** 3/8-Inch, (Supplied w/ Heaters) Model:AC-BV-3/8

BF050N **(4)** **Ball Valve, MA Stewart,** 1/2-Inch NPT 3000# THD FP, WCB Body, Trim CF8M SS, Lever, NACE Model:CSS-F-2

BF075N **(8)** **Ball Valve, MA Stewart,** 3/4-Inch NPT 3000# THD FP, WCB Body, Trim CF8M SS, Lever, NACE Model:CSS-F-2

BR100 **(3)** **Ball Valve, MA Stewart,** 1-Inch NPT 3000# THD FP, WCB Body, Trim CF8M SS, Lever, NACE Model:CSS-F-2

BR200 **(1)** **Ball Valve, Barstock, Haitima,** 2-Inch NPT 2000# THD RP, A105 Body, Trim 304 SS, WOG, FG PTFE Seats & Seals, ASME B16.34 Compliant, NACE (Skid Drain)

BR206N **(12)** **Ball Valve, C&C Atlas,** 2-Inch ANSI 600# RF RO, WCB Body, Trim 316 SS, Lever, NACE Model:206F2RRC5DHL

BR206NL **(4)** **Ball Valve, Williams,** 2-Inch ANSI 600# RF RP, LCC Body, Trim CF8M/316, Lever, NACE Model:W66F26RT

BR406N	**(2)**	**Ball Valve, C&C Atlas,** 4-Inch ANSI 600# RF RP, WCB Body, Trim 316 SS, Lever, NACE Model:406F2RRC5DHL
GL206N	**(1)**	**Globe Valve, PK,** 2-Inch ANSI 600# RF, WCB Body, Trim API 8, Hand Wheel, NACE Model:02-601RF8N-C
CS206N	**(3)**	**Swing Check Valve, Meridian,** 2-Inch ANSI 600# RF, LCC Body, Trim API 12, NACE Model:SC2R6L12-N
CS306N	**(1)**	**Swing Check Valve, Meridian,** 3-Inch ANSI 600# RF, LCC Body, Trim API 12, NACE Model:SC3R6L12-N
NM025	**(4)**	**Needle Valve, Anderson Greenwood,** 1/4-Inch NPT 6000# MxF, 316 SS Body, NACE Model:H1VES-22-SG (NE-100789)
NM050N	**(1)**	**Needle Valve, Gaugetech,** 1/2-Inch NPT 6000# MxF, 316 SS Body, NACE Model:GTB12MFSS
SY206N	**(2)**	**Y-Strainer, Alberta Strainers,** 2-Inch ANSI 600# RF, ASTM A216 GR. WCB Body, Trim 304 SS, 1/8 Perf, 3/4" NPT Drain, NACE Model:NYF600N

Note: Valves quoted are **subject to availability** at time of order. Valves may be substituted with equivalent customer approved brands based on availability, cost adjustment may apply.

7.0 PACKAGE MATERIALS

Structural Material:	SA 36
Vessel V-1610	
Heads:	SA-516-70N
Shell:	SA-516-70N
Skirt:	SA-516-70N
Pipe:	SA-106-B SMLS
Flanges:	SA-350-LF2-CL1
Weld Fittings:	SA-234-WPB
Threaded Piping	
Threaded Pipe:	SA-106-B / SA-333-GR6, Sch. 80 / 160 / XXH SMLS
Threaded Fittings:	SA-105-N / SA-350-LF2-CL1, 3000#
Welded Piping	
Pipe:	SA-106-B / SA-333-GR6, Sch. 40 / 80 / 160 SMLS
Flanges:	SA-105-N / SA-350-LF2-CL1
Weld Fittings:	SA-234-WPB / SA-420-WPL6
Threadolets and Couplings:	SA-105-N
Gaskets:	316 S.S. Flex. (RF Spiral Wound 316L Flexicarb)
Bolting:	SA-193-B7M, SA-194-2HM
Instrument Tubing	
Tubing:	ASTM A269 / ASME SA213 316 SS – 0.035” / 0.049”
Fittings:	316 SS - Swagelok
Ferrules:	SS Ferrules
Tubing Clips:	Plastic

8.0 TESTING / POST WELD HEAT TREAT (PWHT)

Hydro-Testing:

Pressure Vessels:	As per ASME Section VIII Div. 1
Pressure Piping:	As per B31.3

Testing:

Instrumentation:	Subjected to an operational test to ensure proper functioning (excluding electrical)
Instrument Supply Lines:	As per ABSA AB-522
Process Tubing Lines:	As per B31.3

Radiography:

Vessel V-1610:	RT-1 per UW-11 (a) – Long Seam and Circ Seams FULL per UW-11(a)
Weld Piping:	100% BW

PWHT:

Vessel V-1610:	Yes
Piping:	No

Ultrasonic Test: No

Hardness Test:

Vessel V-1610:	No
Sour Piping:	10% BW

MPI Inspections:

Skid Lift Lugs:	100%

- Instruments will be subjected to an operational test to ensure functioning, excluding electrical.
- Instrument tubing will be air / soap tested to normal operating pressure.
- Process instrument tubing to be tested to B31.3

9.0 PAINT / COATING

Surface Preparation:	SSPC SP6-63 Commercial Blast
Package Finish:	Two (2) shop coats Cloverdale DTM (direct to metal) polyurethane enamel – Warm Grey

Notes: Surface preparation and paint applied to external surfaces of equipment only. The underside of skid is excluded from this specification. Equipment mounted on skids prior to surface preparation and painting will be painted where is (i.e. under vessel baseplates, pedestals, etc, will not be painted)

10.0 ELECTRICAL

- Wiring of three (2) 12 VDC heaters (Wiring per class 1, zone 1)

11.0 DOCUMENTATION

- One Equipment Manual (Documents per Document Index) on USB is supplied (shipped with unit). An electronic file sharing link containing the Equipment Manual (Documents

per Document Index) will be emailed to the required recipients. **Hard copies are available at $500 per copy. Extra USBs are available at $50 per USB.**

- P&ID, skid and general arrangement drawings are included.
- Documentation Provided as per NWP's Standard Document Index only
  - This includes MTR's for the following applicable components: welded spool components. Additional MTR's may be included upon request, additional charged to be determined per request.
- Alberta P. Eng stamped As-built drawings **are not included.**

12.0 ADDITIONAL NOTES

- Packages will be dismantled only to the extent required for shipping.
- ABSA now requires end users to complete a *Unit Design Registration* form (UDR) for each vessel. NWP has quoted the vessel(s) based on an existing CRN(s). Based on the information provided by the end user in this form, cost adjustments may be required. If the existing CRN does not meet the requirements of the completed UDR, CRN's may need to be revised, or new CRN's created. One increasingly common issue is NWP's CRN catalogue only allows for type "C" soil designation. If End User requires type "D", CRN revision and any associated changed (material or labour) will result in a cost adder, to be determined at that time. Please note that UDR's **MUST** be completed by end user PRIOR to ABSA signing off on vessel. Any delays as a result of end user not completing UDR in timely manner, may affect overall delivery in which NWP will not be held responsible.
- Structural steel skid welded in accordance with CSA W59.
- **Stainless Steel Instrument Tags Not Included – Available @ $40.00 per tag**

13.0 SHIP LOOSE MATERIALS

- (1) Meter Run Crank Handle & Template
- (4) Prover Ball Valves 2" CL600 [BR206NL] c/w 2" Flange, Plug, gasket, and bolt up
- (2) MC-III Totalizer, Model: 9A-50179024
  - c/w Pick Up Flow Meter, Model: 9A-100002077