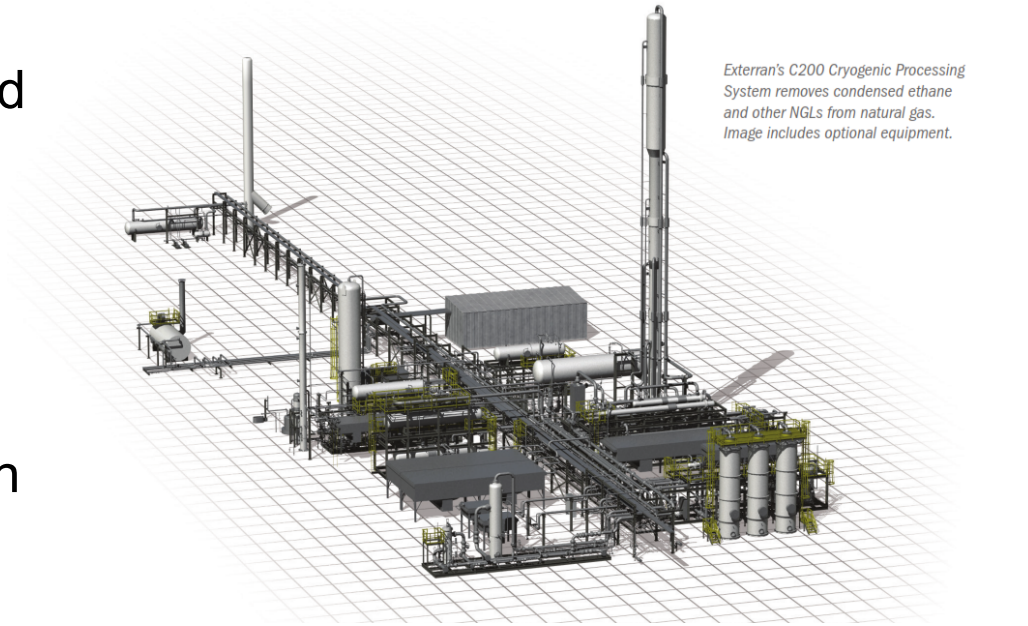
Exterran C200-RSV 4500 HP Refrigeration Including Cold Separator and Interconnect Piping

Overview

- Our client has purchased a C200 RSV Cryo from Exterran for a business need that has been fulfilled by another party.
- The cryo equipment is skidded and the skids are currently split between two yards in Broken Arrow and Tulsa, Oklahoma.
- All equipment is complete with exception of the tower internals.
- Transferable warranty good until 25 MAY 2021.

EXTERRAN

C200 CRYOGENIC GAS PROCESSING SYSTEM



Exterran's C200 Cryogenic Processing System removes condensed ethane and other NGLs from natural gas. Image includes optional equipment.

Equipment List

- Regeneration Gas Compressor
- Regeneration Gas Heater
- Regeneration Gas Cooler
- Inlet Gas Separator
- Dehydration Inlet Filter
- Dehydration Adsorbers
- Dehydration Dust Filters
- Seal Gas Coalescer
- Regeneration Gas Scrubber
- Inlet Gas Heater
- Expander/Compressor Package & SRA
- Product Heater
- Gas/Gas Exchanger
- Reflux Condenser
- Demethanizer Bottom Reboiler
- Demethanizer Side Reboiler
- Trim Reboiler
- Seal Gas Heater
- Expander Compressor Discharge Cooler
- De-ethanizer Product Cooler
- Cold Separator
- De-methanizer Surge Tank
- Cool Separator
- Residue Recycle Gas Filter/Coalescer
- Residue Gas Filter/Coalescer
- De-methanizer
- De-methanizer Internals/Packing
- Product Booster Pumps
- Methanol Injection Pump
- Fuel Gas Scrubber
- Refrigerant Compressors
- Gas Chiller
- Refrigeration Lube Coolers
- Refrigerant Condensers
- Refrigerant Suction Scrubber
- Refrigerant Economizer
- Refrigerant Reclaimer
- Refrigerant Accumulator
- Interconnecting Pipe

Recoveries and Operating Conditions

The Exterran C200 is capable of operating in a range of inlet conditions. Below shows the operating conditions and recoveries for two cases of high GPM gas. This particular plant incorporates a cold separator to handle heavier inlet gas compositions.

CASE	SUMMER	WINTER
Inlet Gas Rate MMSCFD (**Note 1**)	150.62	158.51
Pressure psig	845	845
Temperature °F	80	35
Component	Mole %	
Nitrogen	2.24	2.42
CO2	0.84	0.86
Methane	62.10	65.58
Ethane	21.30	21.38
Propane	9.34	7.71
i-Butane	0.85	0.53
n-Butane	2.44	1.28
i-Pentane	0.34	0.11
n-Pentane	0.45	0.12
n-Hexane	0.07	0.01
n-Heptane	0.01	0.00
n-Octane	0.00	0.00
n-Nonane	0.00	0.00
H2O	0.01	0.01
H2O Content	7#/MMSCF	7#/MMSCF
GPM C2+	9.61	8.48

	C200 RSV / 4500 HP Refrig		C200 RSV / 6000 HP Refrig	
	Summer C2 Rejection	Winter C2 Rejection	Summer C2 Recovery	Alt Summer C2 Recovery
Inlet Gas Comp GPM	9.61	8.48	9.61	9.61
Inlet Flow [MMSCFD]	150.62	158.51	150.62	150.62
Inlet Temp [F]	80	35	80	80
Inlet Pres [psia]	860	860	860	860
Inlet Drip [USGPM] (@Std Cond)	11.43	168.87	11.43	11.43
Flow to Dehy [MMSCFD]	150.02	150.02	150.02	150.02
Temp to Dehy [F]	90	90	90	90
Cold Sep Pres [psia]	823	823	824	824
Cold Sep Temp [F]	-13.0	-2.0	-30.0	-21.2
Tower Ovhd Pres [psia]	275	270	215	215
Refrig Comp [HP]	4451	462	5924	5031
Exp Eff (isen) [%]	84.0	85.5	85.5	86.9
Recomp. Eff (poly) [%]	71.3	73.5	72.9	76.3
Recomp Discharge Pres [psia]	307	318	243	255
Residue Comp [HP]	14830	14452	15056	14374
C2 Recovery (calc'd) [%]	40.61	33.45	87.58	92.53
C3 Recovery (calc'd) [%]	99.71	99.38	99.99	100.00
Residue Gas [MMSCFD]	115.0	125.0	98.9	96.6
Residue Gas HHV [Btu/SCF]	1100	1100	999	990
NGL Std. Liq. Vol. [USGPM]	617.4	420.2	872.8	911.3
NGL C1/C2 LV%	0.566	1.132	0.006	0.879
NGL C1 LV%	0.349	0.500	0.004	0.500
NGL Vapor Press @ 100F [psia]	350	411	452	485
NGL CO2/C2 LV%	0.320	0.285	0.320	1.013
NGL CO2 wt%	20.872	0.232	0.340	1.097

Notes:
1) Air Cooler outlet temperature is assumed to be 90F/120F for winter and summer cases respectively.
2) Residue Dishcharge Pressure is 1400 psig.

Recovery Case

Compressors			
		C-131-1	C-131-2
Power	hp	7702	7354
Adia Eff		80.00	80.00
Poly Eff		81.76	81.78
ICFM	ACFM	5867	2324
Adiabatic Head	ft	49857	47609
Polytropic Head	ft	50955	48667
Pressure Ratio		2.449	2.417

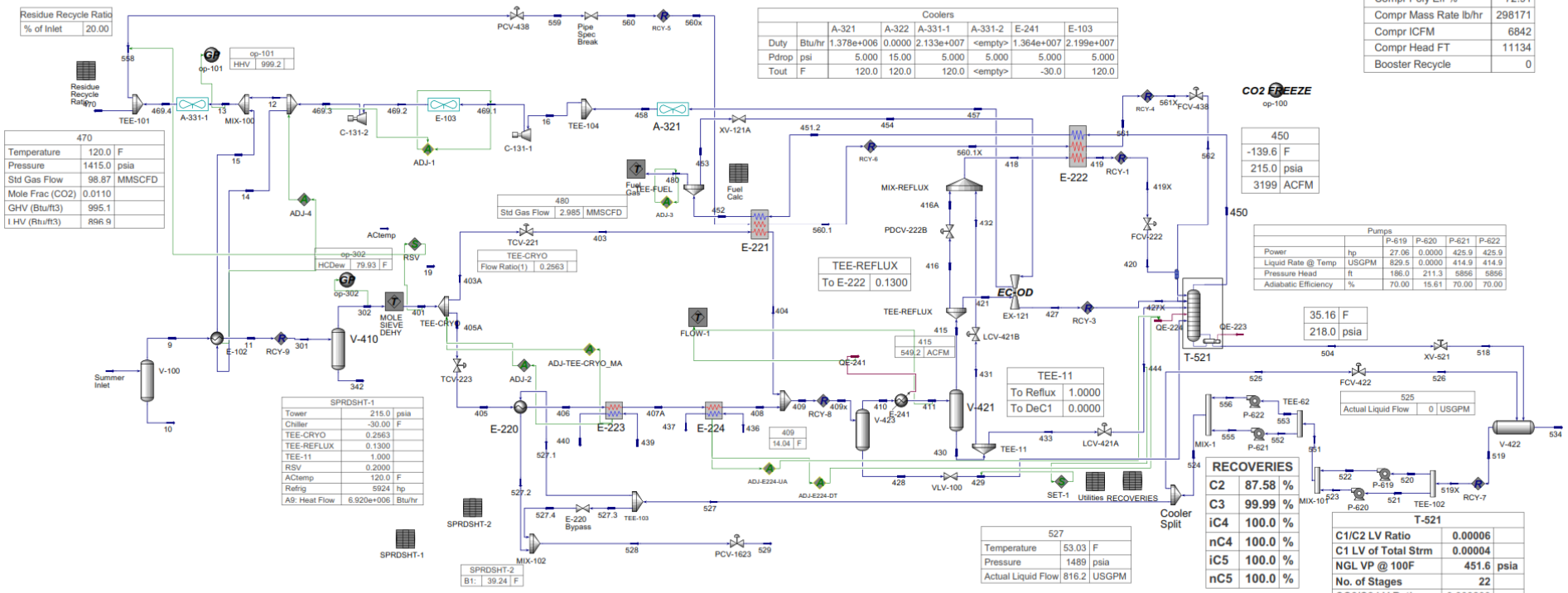
Utilities		
Refrig BHP	<empty>	hp
Refrig Condenser	<empty>	Btu/hr
Refrig ICFM	<empty>	ACFM
Residue BHP	15056	hp
Residue Suction ICFM	5867	ACFM
Regen Gas Heater	1.518e+007	Btu/hr

Heat Exchangers					
		E-220	E-225	E-100	E-102
Duty	Btu/hr	4.439e+006	0.0000		2.746e+006
UA	Btu/F-hr	357502			55093
LMTD	F	12.42			49.85
Pinch	F	8.0			10.0

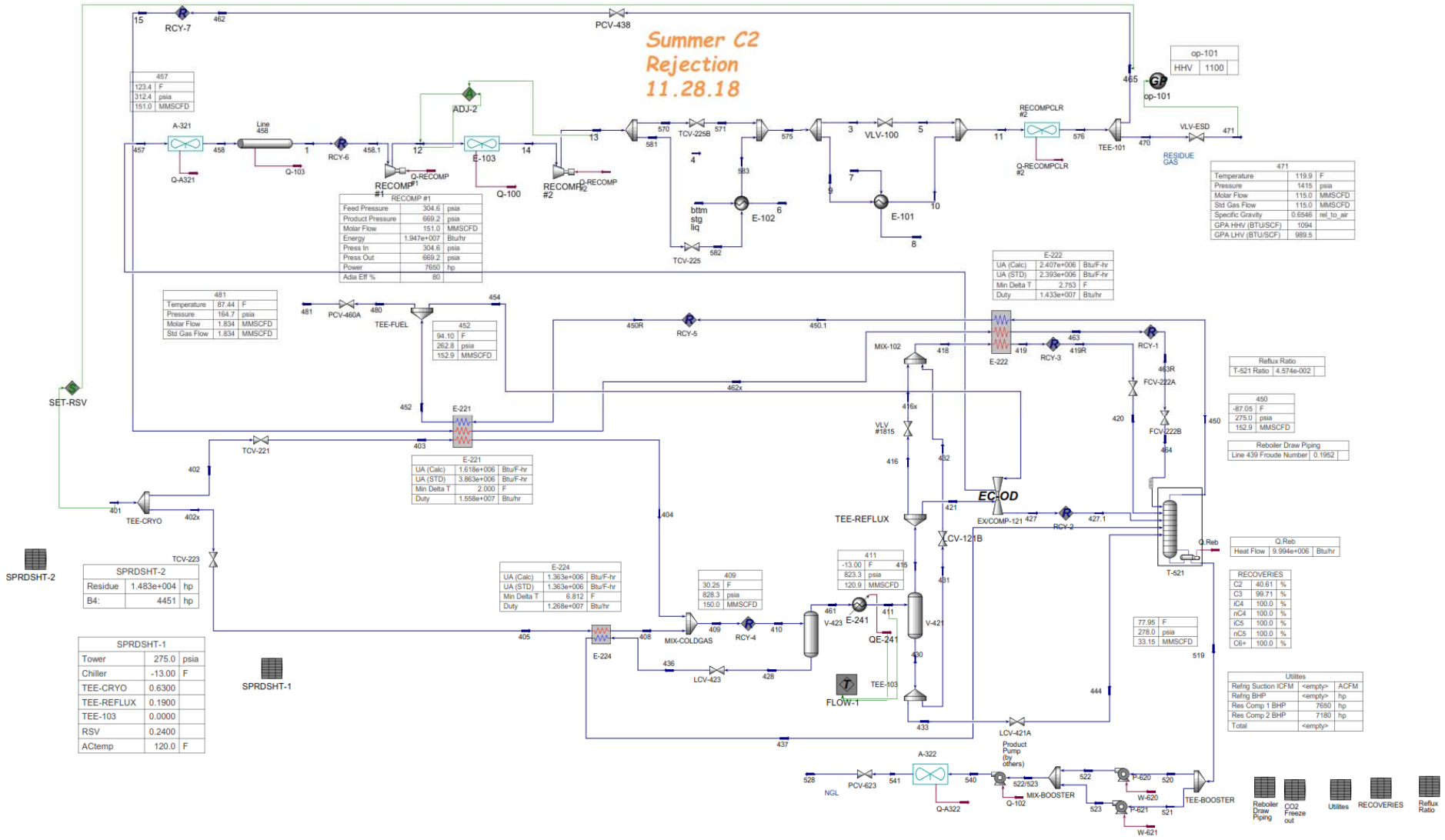
BAHX					
		E-221	E-222	E-223	E-224
Duty	Btu/hr	1.504e+007	1.533e+007	1.071e+007	6.920e+006
Wtd UA	Btu/F-hr	2746500	1465976	428115	642079
Spec Value for UA - if exists	Btu/F-hr	3368400	2905400	428600	1476000
LMTD	F	5.48	10.45	25.03	10.78
Pinch	F	2.00	2.00	14.80	5.27

RCE EC-OD v1.21s	
	EX-121
Exp Power BHP	1910
Exp Adia Eff %	85.47
Exp Enthalpy Btu/lb	36.28
Exp Mass Rate lb/hr	156743
Exp Speed RPM	23430
% of Design Speed	100
% of SAH	84
Bearing Loss BHP	23
Compr Poly Eff %	72.91
Compr Mass Rate lb/hr	298171
Compr ICFM	6842
Compr Head FT	11134
Booster Recycle	0

Summer C2 RECOVERY
11.28.18



Rejection Case



SPRDSHT-1		
Tower	275.0	psia
Chiller	-13.00	F
TEE-CRYO	0.6300	
TEE-REFLUX	0.1900	
TEE-103	0.0000	
RSV	0.2400	
ACtemp	120.0	F

SPRDSHT-2		
Residue	1.483e+004	hp
B4:	4451	hp

Rotating Equipment

Frick Refrig Compressors
1500 HP Electric Screw

Sundyne Regen Gas
Compressor

Atlas Copco

Turboexpander
provided by Atlas Copco

Miscellaneous Pictures



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