

Asset PK-5101

ASU Air Separation Unit 600 TPD

Plant Description

Production

The Air Separation Unit (ASU) and ancillary systems in Southeast US.

The ASU was originally commissioned in 1997 It produces 400 KSCFH of Gaseous Oxygen (GOX) at 200 psig and another 100 KSCFH of Gaseous Oxygen (GOX) at 3 psig, Oxygen Purity 99.5%, N2 Purity less than 10 PPM O2

This ASU plant also makes 100 KSCFH of Liquid Oxygen (LOX) & 200 KSCFH of Gaseous Nitrogen (GAN) at 400 psig, plus 69.2 KSCFH of Liquid Nitrogen (LIN) and 23.9 KSCFH of Liquid Argon (LAR) Less than 1 PPM O2 and less than 1 PPM N2



The plant has a film-type main vaporizer with two BAHX closed cores supplied by Sumitomo and is equipped with an alumina/CaBaX air purification system.

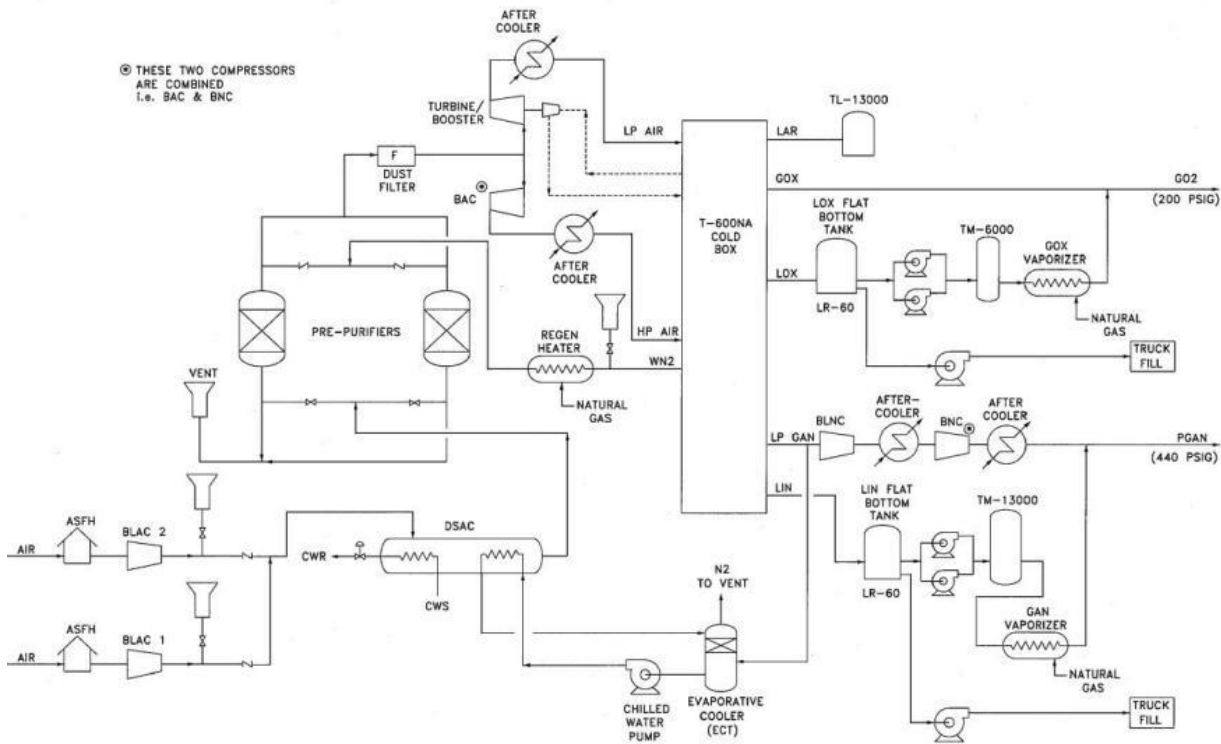
The natural gas fired heater provides heat for regeneration.

HP column has trays. LP column and two argon columns have packing. Argon production is “cryo-argon” type.

Liquid dumping is through forced air dump vaporizer.



600 TPD Plant



Product Storage & Vaporization:

The LP liquid products are stored in two 525,000-gallon LOX and LIN flat-bottomed storage tanks. LAR is stored in an 11,000-gallon tank. The HP LOX and HP LIN are stored in a 6000-gallon tank and 13,000-gallon tank, respectively.

The backup system is a hot water bath vaporizer with an estimated capacity of 1000 KSCFH and multiple coils (GOX, GAN, and Tank pressurization coils). The two hot water boilers are natural gas fired.

LOX, LIN, and LAR trailers are loaded by pumps in one load-out station. A single scale provides Gross & Tare weights of trailers.

Control System

The control system is comprised of (5) AB PLC5 processors with remote IO in 11 cabinets. The HMI was iFix32 installed on Windows XP. There are very few pneumatic and single-loop electronic controllers. However, no local panels are present at the compressors.

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Utilities

Electricity is delivered to the site via aerial cable by Axiell/Westlake. The electrical system includes main plant, 34.5 KV high voltage electrical substation and overhead distribution lines from Axiell/Westlake cogen units to the substation. The distribution substation consists of a 34.5 KV to 13.8 KV 20MVA Transformer, an elevated PDC building containing a 13.8 KV Switchgear, 4.16 KV Switchgear, two 480 Volt MCCs, Battery Bank, and Emergency 480 Volt Generator with an auto transfer switch. The substation and plant are located next to the old Georgia Gulf Plant (now Westlake).

A 2-cell evaporative cooling tower with two cooling water circulation pumps (one online and one standby) provides cooling water for the site's operations.

The local municipal water system provides potable water and processed water. Make-up water for the cooling water system is supplied by the customer.

Miscellaneous

Plant Documentation (OEM Manuals, P&IDs, Electrical drawings, etc.) are on file at the site.

Production Capabilities

Product	Units of Measure	Expected Performance
GO2 gaseous oxygen	SCFH	402,500 @ 200 psig
GO2 gaseous oxygen	SCFH	100,000 @ 3 psig
GN2 gaseous N2	SCFH	1,872,000 @ 400 psig
LO2 liquid oxygen	SCFH	100,300
LN2 liquid nitrogen	SCFH	74,000
LAR liquid argon	SCFH	23,900

Also Waste N2 gaseous nitrogen 305,600 SCFH

Recent Major Expenditures

2017

- Perlite refill - LP cold box
- FES Motor Spare Replenishment
- K-201 Refurbishment

2015

- Mac 2 Overhaul

Equipment List

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Component	Manufacturer	Model No.	Serial No.	Notes
Air Inlet Filter House	Dollinger	AI-128-V-1400-480		
Main Air Compressor - BLAC 1	Cooper Industries	4MSGEP9A	F10295	<ul style="list-style-type: none"> • 4 stage • Radial • Integrally geared
Main Air Compressor - BLAC 2	Cameron/Cooper	4MSGEP9A	F10296	
MAC Motors	GEC	Frame 710G1800P	N44044201, N44044202	<ul style="list-style-type: none"> • TEWAC • F Class • 8000 HP • 1800 RPM
MAC Aftercooler	Basco	70/64216		<ul style="list-style-type: none"> • Shell MAWP - 350 psig • Tube MAWP - 150 psig • 2-stage
Evaporative Cooler	Augusta Fiberglass			• 8.5' x 37' 2-slage
Chilled Water Pump	Goulds	3196MTX		• 3 x 4x - 8G
Pre-Purifier Vessels	Dacro			• 12' dia, x 10.5 ' s-s
Pre-Purifier Dust Filter	NAFCO	43200-1136B/SPL		• MAWP - 350 psig @ 450 °F
Regeneration Heater	Gastech			• 3.57 mm btu/hr.
Primary Heat Exchanger	Sumitomo			
Nitrogen Superheater	Sumitomo			
O ₂ Boiler	Sumitomo			
Expander/Booster	Praxair	CDB-304		<ul style="list-style-type: none"> • Radial • Single sha
Turbine Booster Shell and Tube Aftercooler	BASCO	BEP29156		
Booster Air/Booster N ₂ Compressor	Ingersoll Rand	3CHB1B2	M95-8651	<ul style="list-style-type: none"> • 1st - 2nd stages - BAC • 3rd stage - BNC • Radial • Integrally geared
Air Booster Shell and Tube Aftercooler	BASCO	BEP 16156		
N ₂ Booster Shell and Tube Aftercooler	Basco	BEP 10150		
Baseload Nitrogen Compressor	Ingersoll-Rand	2ASB40M3		
BLNC Aftercooler	BASCO	BEP10150		
BLNC Motor	Siemens	Frame 5810S		<ul style="list-style-type: none"> • 1500 HP • 3573 RPM • F Class • Type CGII
BNC Motor	Siemens	Frame 5810		<ul style="list-style-type: none"> • 1250 HP • 3573 RPM • F Class • Type CGII
O ₂ Product Boiler Pumps	Cryomach			• two (2) 1.5 x 2.5 x 10.5
Argon Transfer Pump	Cryomach			• 1.5 x 25 x 10.5
O ₂ Downflow Main Condenser Pumps (2)	Lawrence			<ul style="list-style-type: none"> • 8 x 6 x 16 ver cal turbine • Ver cal turbine pump • 880 GPM design
Downflow Main Condenser	Sumitomo			• 48" x 48" x 240"
Argon Condenser (2)	Sumitomo			

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Component	Manufacturer	Model No.	Serial No.	Notes
Argon Re-condenser	Sumitomo			
Pressure Building Coil for Argon Bulk Tank	Thermax	TF208-HP-I'B		
LO ₂ Storage Tank	PDM	LR-60		
O ₂ Liquid Backup System Pump (2)	Cryomach			• 1.5 x 2.5 x 105
High Pressure O ₂ tank		TM6000		
Argon Bulk Tank		TL-13,000		
O ₂ /N ₂ Liquid Backup System	Cryoequip	WCVB-26-19-5		
Vaporizer/Pressure Building Coil for High Pressure O ₂ /N ₂ Tanks				
Hot water Heaters for Vaporizer (2)	Sellers	S-300-W		
LN ₂ Storage Tank	PDM	LR-60		
N ₂ Liquid Backup System Pumps (2)	Lawrence			• 1.5 x 2 - 9 ver cal turbine pumps
High Pressure N ₂ Tank		TM13,000		
Cooling Tower	GEA - Thermal Dynamic	TDJOJO-2-Z027CF		• sized for 6500 GI'M
Cooling Water Pump (2)	Goulds	3410L		• 10 x IZ- 17
Drain Vaporizer	J.D. Cousins			• 54" dual ring
Nitrogen Chill Tower	Augusta Fiberglass			
SF ₆ Gas Breaker	Siemens			• 1200 amp • Type SPS-38-31.5-1200
Backup Generator	Caterpillar		Gen S/N 6FA11170 Eng S/N 7DB01191	• 300 KW • Supplied with 180 KW Southworth-Milton Load Bank
PDC Building	Athinson			• 60' x 14' 6", with (2) AC units

600 TPD Asset

Cold Box



600P TPD Asset

Main Air & Product Compressors



600 TPD Plant

Boilers & Dryer Skid



600 TPD Plant

Control Room & Equipment

