Integrated Coal Gasification & Chemical Production Facility

1. Executive Overview

The Integrated Gasification & Chemical Production Facility represents a unique opportunity to acquire and relocate the equipment from a large-scale IGCC complex for energy and chemical production. The facility combines a coal gasification plant, an Air Separation Unit (ASU), and a sulfuric acid plant within a single integrated site designed for efficient industrial operation. It produces sufficient amount of syngas used to generate 315 MW of power. (Note: power generation equipment isn't included). The plants offer significant potential for redevelopment, re-building, recommissioning, or integration into future energy, industrial gas, chemicals, power generation, or hydrogen-related projects.

2. Facility Description

2.1 Coal Gasification Plant

The coal gasification plant uses entrained-flow, oxygen-blown technology that was developed by Texaco and later purchased by General Electric Co. It has designed capacity of 162 MMSCFD (19,104 m3/hr; 1,896.81 MMBTU/hr) syngas output at 217.7 °F and 315 PSIG. Major compositions in the syngas (vol%): 38.06% H2, 45.23% CO, 12.82% CO2, 2.56% N2.

Equipment List

Feed Preparation & Handling
Coal / Petroleum Coke Storage Silos
Reclaim Conveyors & Feed Conveyors
Crushing System (Rod mills)
Slurry Preparation System:
Slurry Mix Tanks
Agitators
Slurry Pumps (high-pressure plunger pumps)
Slurry Additive Handling System (limestone, flux)
Gasification Reactor System
Entrained Flow Gasifier Reactor (Texaco / GE)
Refractory Lining System
Burner Assemblies (slurry + O_2 injection)

High-pressure Vessel Shell
Instrumentation nozzles and thermowells
Hydrogen Analyzer
Quench & Syngas Cooling
Radiant Syngas Cooler Boiler
RSC Sump & Slag Crusher
Preheating
Burner Cooling Water Supply
Process Burner and Gasifier
Oxygen Feed System
Soot Blowing System
Non-Existant H2 Annulus Pressurization System
Syngas Cooler HP Steam System
West Convective Syngas Cooler
East Convective Syngas Cooler
East Wing Aspirator
West Wing Aspirator
Syngas Cooler MP Steam System
Gasification Steam and Blowdown System
Quench Chamber / Water Bath
Quench Ring / Spray System
Quench Water Pumps
Steam Generation System (from syngas cooling)
Slag Handling System
Slag Tap / Bottom Removal System
Lockhopper
Lockhopper Flush Drum
Slag Drag Conveyor
Coarse Slag Screen
Coarse Slag Conveying
Decant Water System
Recycle Slurry Tank (T-111)
Lockhopper Valves Hydraulic Controls
Slag Quench Tank
Lock Hopper System
Slag Crushers
Dewatering Bins / Conveyors
Slag Storage Area
Gasification and Fines Sumps
Syngas Cleanup (Hot & Cold Gas Cleanup)

Particulate Removal
Cyclones (primary separation)
Scrubbers
Syngas Scrubbing - Train A
Scrubber Circ Pump - Train A
Syngas Scrubbing - Train B
Scrubber Circ Pump - Train B
Acid Gas Removal (AGR)
Absorber Columns (Selexol or Rectisol systems)
Strippers / Regenerators
Solvent Circulation Pumps
Heat Exchangers
Flash Drums
Contaminant Removal
COS Hydrolysis Reactor
COS KO Drum & Superheater
COS Hydrolysis Reactor Unit
Process Condensate Drum
Clean Gas Preheater
Mercury Removal Beds (Activated carbon)
Ammonia Stripper
Ammonia Stripper Reflux System
Ammonia Stripper Preheater
Chloride Removal System
Vacuum Flash Drum
Vacuum Overhead System
Vacuum Pump System
Grey Water
#1 Gravity Settler
Grey Water Tank
Grey Water Storage Tank
Settler Feed Tank
#2 Gravity Settler
Grey Water Surge Tank
Amiad Filter Skid and Feed Pump
Brine Concentration & Disposal System
Brine collection tanks
Brine transfer pumps
Brine Compressor

Brine concentrators
Evaporator Condensate Cooler, Storage Tank, & Pumps
Crystallizers
Solids handling (salt cake)
Brine storage and disposal interface
Entrainment Separator
Fuel Gas Conditioning
Syngas Saturation System
Fuel Gas Compressors
Nitrogen Dilution System (for turbine NOx control)
Final Fuel Gas Knockout Drums
Steam & Water Systems
Heat Recovery Steam Generators (HRSG integration)
Boiler Feedwater Pumps
Deaerator
Condensate Polishing System
Cooling Water System
Cooling Towers
Steam Sampling Building
Auxiliary Boiler
Utilities & Support Systems
Flare System (syngas and startup)
Flare System- Flare KO Drum
Flare System- Main & Acid Gas Flare Headers
Flare System- Clean Gas Flare HDR and Flare Quench Drum
Power Block Flare Header
Control & Instrumentation
Gas Analyzers (H_2, CO, H_2S, CO_2)
Pressure, Temperature, Flow Transmitters
Flame Detection Systems
Hydrogen Analyzer

2.2 Air Separation Unit (ASU)

Used air separation unit built by Air Products & Chemicals and commissioned in 1996 to produce pressured oxygen and nitrogen gas, and liquid nitrogen products from ambient Air. The processes used are (1) Air Compressor and purification, (2) liquefaction using expansion turbine refrigeration, (3) separation of the liquid products by cryogenic distillation, (4) storage of liquid nitrogen, (5) vaporization of oxygen and nitrogen to gases, followed by Compressor to meet gasifier, combustion turbine, acid plant, blanketing, and purging requirements. The ASU generated gaseous oxygen (2,100 tons/day of oxygen, minimum purity 95%), gaseous nitrogen (6,000 tons/day of nitrogen, minimum purity 98%) and high-pressure gaseous nitrogen (400 tons/day, minimum purity 99.99%). The guaranteed maximum utility consumption for the ASU is as follows: power 54,535 KW, cooling water flow 17,340 GPM, LP Steam flow 7,000 lbs/hr. The ASU was shut down in 2024. All its equipment is maintained well.

Equipment List

Equipment Name	Manufacturer
Adsorber Vessels (4)	The J.K. Best Company
Main Air Compressor	Demag Delaval Turbo Corp.
ASU Companders (Compressor + Expander) (2)	Air Products & Chemicals
GOX Compressor	Demag Delaval Turbo Corp.
Diluent GAN Compressor	Demag Delaval Turbo Corp.
HP GAN Compressor	Demag Delaval Turbo Corp.
HP Column	Air Products APE
LP Column	Air Products APE
MAC Lube Oil Demister	Dollinger Corp.
Compander Lube Oil Demister	Filtration Engineering
GOX Compressor Lube Oil Demister	Dollinger Corp.
Diluent GAN Compressor Lube Oil Demister	Dollinger Corp.
HP GAN Compressor Lube Oil Demister	Dollinger Corp.
MAC Motor Cooler	ABB
GOX Compressor Motor Cooler	ABB
Diluent GAN Compressor Motor Cooler	ABB
MAC Intercooler 1st Stage	Senior Engineering
MAC Intercooler 2nd Stage	Senior Engineering
MAC Intercooler 3rd Stage	Senior Engineering
MAC Lube Oil Coolers (2)	ITT Standard
MAC Aftercooler	Senior Engineering
ASU Compander Lube Oil Coolers (2)	ITT Standard
ASU Compander Aftercooler	Basco Division
GOX Compressor Intercoolers (2)	Basco Division
GOX Compressor Lube Oil Coolers (2)	ITT Standard
GOX Compressor Recycle Cooler	Basco Division
Diluent GAN Compressor Intercooler	Senior Engineering
Diluent GAN Compressor Lube Oil Coolers (2)	ITT Standard
HP GAN Compressor Intercooler	Senior Engineering

HP GAN Compressor Lube Oil Cooler	ITT Standard
HP GAN Recycle Cooler	Basco Division
Adsorber Air Aftercooler	Senior Engineering
Adsorber Regen GAN Cooler	Senior Engineering
Adsorber Regen Steam Heater	Basco Division
Main Heat Exchangers	Altec International Inc.
RebOiler Condenser	Sumitomo Corporation
N2 Subcooler	Altec International Inc.
LOX Purge Vaporizer	Altec International Inc.
Disposal Vaporizer	Thermax Inc.
Pressure Buildup COil	Taylor Wharton
LIN Backup Vaporizer	Cryoquip Corporation
Inlet Air Filter	American Air Filter International
MAC Lube Oil Filters	National Filtration Systems
ASU Compander Lube Oil Filter	National Filtration Systems
Compressor Startup Seal Gas Filter	Dollinger Corporation
GOX Compressor Lube Oil Filter	National Filtration Systems
GOX Compressor seal gas Filter	Dollinger Corporation
Diluent GAN Compressor l/o Filter	National Filtration Systems
Diluent GAN Compressor seal gas Filter	Dollinger Corporation
HP GAN Compressor l/o Filter	National Filtration Systems
HP GAN Compressor seal gas Filter	Dollinger Corporation
Air Adsorber Afterfilter	Dollinger Corporation
GAN Regeneration Afterfilter	Dollinger Corporation
Adsorber Instrument Air Filter	Dollinger Corporation
MAC Lube Oil Heater	Watlo
ASU Compander Lube Oil Heater	Watlo
GOX Compressor Lube Oil Heater	Watlo
Diluent GAN Compressor Lube Oil Heater	Watlo
HP GAN Compressor Lube Oil Heater	Watlo
MAC Motor	General Electric Canada
GOX Compressor Motor	General Electric Canada
Diluent GAN Compressor Motor	General Electric Canada
HP GAN Compressor Motor	Siemens Energy
MAC Lube Oil pump	Rickmeier GmBH
MAC Lube Oil pump	Delaval “IMO”
ASU Compander Lube Oil pump	Delaval “IMO”
GOX Compressor Lube Oil pump	Rickmeier GmBH
GOX Compressor Lube Oil pump	Delaval “IMO”
Dil GAN Compressor Lube Oil pump	Rickmeier GmBH
Dil GAN Compressor Lube Oil pump	Delaval “IMO”
HP GAN Compressor Lube Oil pump	Rickmeier GmBH
HP GAN Compressor Lube Oil pump	Delaval “IMO”

MAC Lube Oil reservoir	L.S.I.
ASU comp Lube Oil reservoir	L.S.I.
GOX Compressor Lube Oil reservoir	L.S.I.
dil GAN Compressor Lube Oil reserv	L.S.I.
HP GAN Compressor Lube Oil reserv	L.S.I.
MAC inlet silencer	Winter Welding & Machine
MAC discharge silencer	Winter Welding & Machine
MAC discharge vent silencer	Pulsco
GOX Compressor suction vent silencer	Pulsco
GOX Compressor disch vent silencer	Pulsco
dil GAN Compressor disch vent silencer	Pulsco
dil GAN Compressor suct vent silencer	Pulsco
1-asn-sil-342	Winter Welding & Machine
HP GAN suction vent silencer	Pulsco
HP GAN discharge vent silencer	Pulsco
HP GAN Compressor inlet silencer	Winter Welding & Machine
HP GAN Compressor discharge silencer	Winter Welding & Machine
Air Adsorber s vent silencer	Industrial Fabricators Inc.
Air to Regen start-up silencer	Pulsco
GAN bypass silencer	Pulsco
Defrost vent silencer	Winter Welding & Machine
MAC Lube Oil skid	Lube Systems Inc.
ASU Compander Lube Oil skid	Lube Systems Inc.
GOX Lube Oil skid	Lube Systems Inc.
Diluent GAN Lube Oil skid	Lube Systems Inc.
HP GAN Lube Oil skid	Lube Systems Inc.
ASU Adsorber skid	Harmony Construction Corp
ASU Adsorber skid	Harmony Construction Corp
LIN back-up tank	Taylor-Wharton International
Motor control center	Allen-Bradley
4.16kv switchgear	Powell Electrical Mfg Co.
13.8kv 3000a switchgear	Powell Electrical Mfg Co.
13.8 kv 1200a switchgear	Powell Electrical Mfg Co.
Motor starting autotransformer	ABB
13.8kv Bus Duct	Unibus Inc
480 volt Bus Duct	Unibus Inc
Electrical/Analyzer Building	Varco-Pruden

2.3 Sulfuric Acid Plant

The double-absorption sulfuric acid plant was designed by MECS (Monsanto Enviro-Chem System, Inc.) to process an acid stream from an acid gas removal unit (AGR), an ammonia acid

gas stream from an ammonia stripper, and a sulfur dioxide stream from a hot gas cleanup unit (HGCU). The acid gas removal unit is a conventional amine unit using MDEA. The ammonia stripper unit is a steam stripping system that removes the hydrogen sulfide, carbon dioxide, ammonia and other gases from sour water. The hot gas cleanup unit uses a solid reactant to remove sulfur compounds from a gas stream and is then regenerated with dry air. The plant produced industrial grade 98% sulfuric acid. Maximum operation capacity (permitted capacity) is approximately 230 tons/day. The plant consists of 4 process sections: (1) Formation of sulfur dioxide (SO2) gas in the decomposition furnace with the combustion of H2S gas. (2) Cooling and purification of the SO2 process gas. (3) Convention of the SO2 to sulfur trioxide (SO3) gas. (4) Absorption of the SO3 in sulfuric acid.

Equipment List

Incinerator Stack
Liquid Sulfur Storage Tanks
Startup Air Preheater & Control
Propane and AGR Gas Burner Controls
Ammonia Gas Burner Controls
AGR Gas KO Drum
Decomposition Furnace Area
Waste Heat Boiler Area
Gas Cooling Tower Area
Weak Acid Coolers
Effluent Stripper Area
Drying Tower Area
Main Compressor and Motor
Conveter and Heat Exchanger Area
Interpass Heat Exchanger Area
Interpass Absorption Area
Final Absorption Area
Fresh Acid Storage Area
Product SO2 Stripper

4. Strategic Opportunities

The facility may present multiple strategic opportunities for industrial operators, energy companies, infrastructure investors, chemical producers, or project developers.

1. Power generation or cogeneration projects
2. Hydrogen production and energy transition projects
3. Industrial gas production and distribution
4. Chemical manufacturing and downstream processing
5. Industrial redevelopment and repurpose

5. Key Advantages

- Integrated process configuration
- Immediate availability of major process equipment
- Full technical documentation available
- Large-scale utility and support systems included