Internal Corrosion in Tanks and Vessels 38th Annual Meeting

Lance Barton - EnhanceCo
Tom Pickthall - EnhanceCo

What Causes Internal Corrosion?

- Acid Gasses
- Corrosive Components
- Corrosive Byproducts
- Solids
- Microbiology
- WATER

What Can We Do about Internal Corrosion (in Tanks and Vessels)

- Design
- Remove Corrosive Constituents Prior to entering tanks and vessels in the process
- Coatings
- Inhibition
- Cathodic Protection

What Accelerates Internal Corrosion

- Heat
- Lack of Flow/ Too Much Flow
- Deposition of Debris
- Pressure
- Product Quality

Upstream Vessels and Tanks

Field Tanks

HP Separators

LP Separators

Heat Exchanges

Drain or Sump Lines

Midstream Vessels

- Slug Catchers
- Filter Separators
- Line Heaters
- Compressors
- Fin Fan Coolers
- Gas Storage
- Liquid Tanks
- Drain or Sump Lines

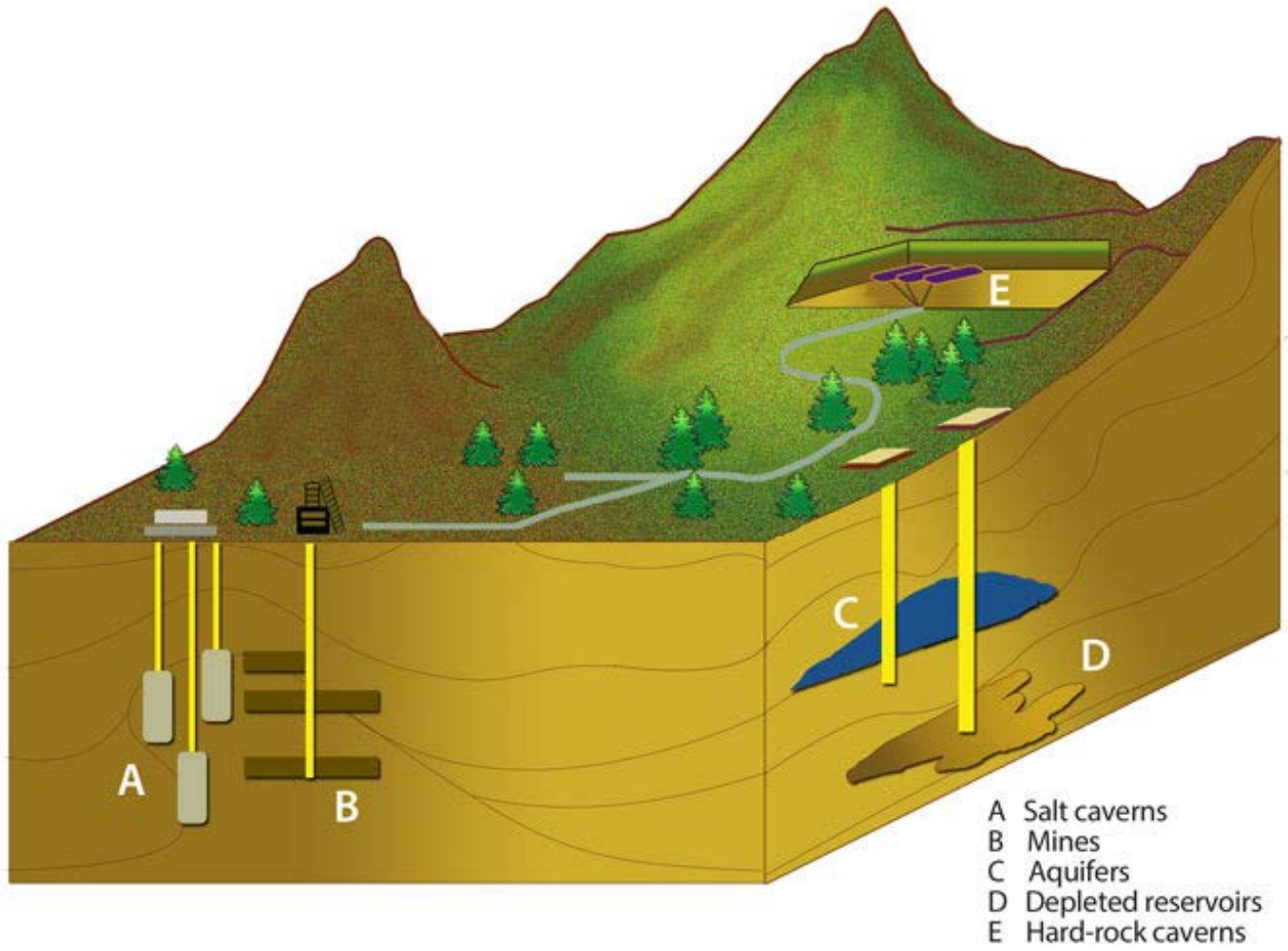
Were to Look?

- Large Pressure Changes (meters, dump valves, changes in pipe diameter)
- Large Temperature Changes (Fin Fans, Headers, Exhaust Pipes
- Places where acid gasses can (or are forced to) break out or concentrate (reflux towers and throttle valves on amine units)
- Solids Deposition (bottom of slug catcher, liquid dump on slug catcher, condensate tank, water tank, fuel scrubber etc.)

Gas Storage

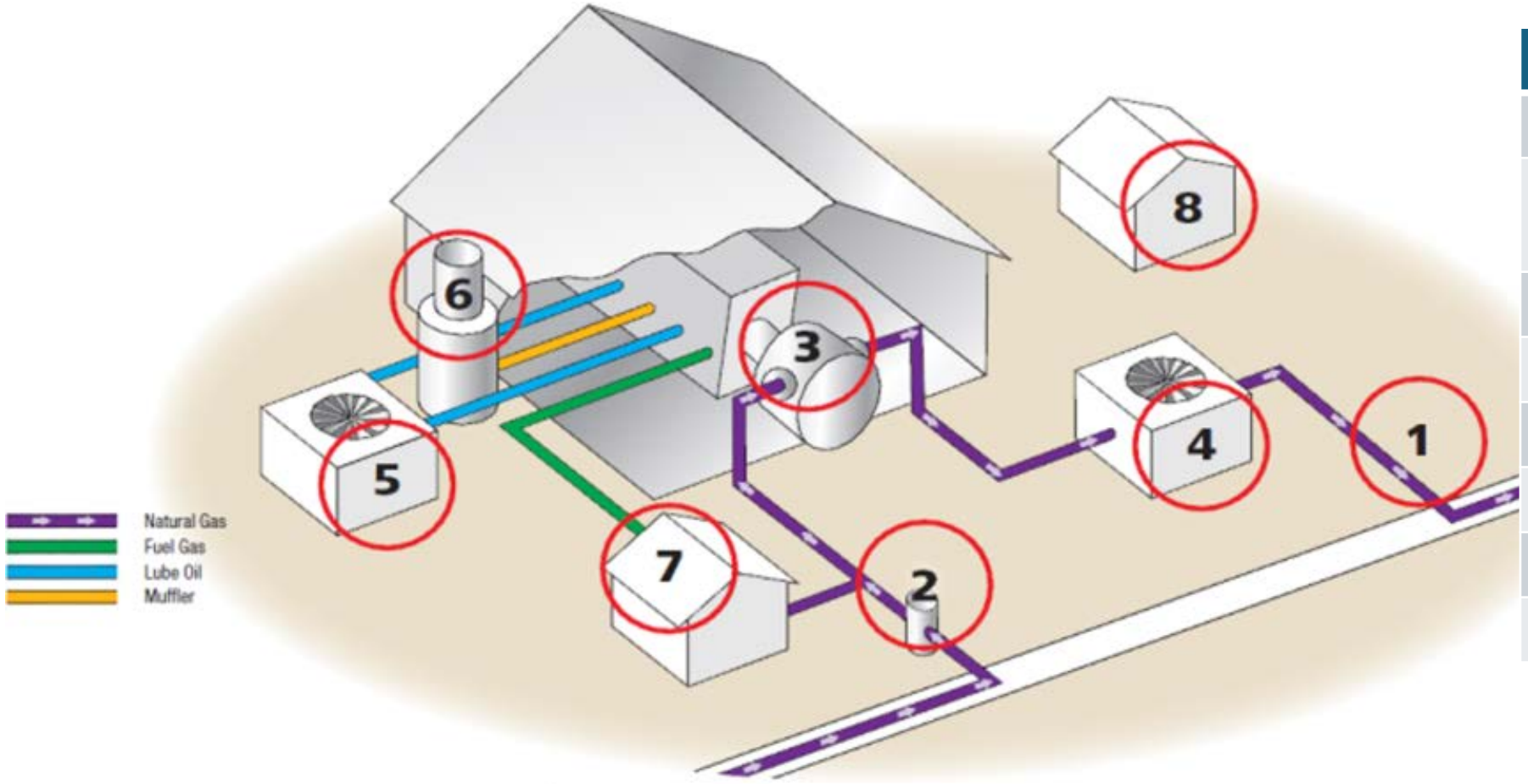
- Aquifer
- Depleted Reservoir
- Hard Rock
- Salt Domes

Figure 1. Types of underground natural gas storage facilities



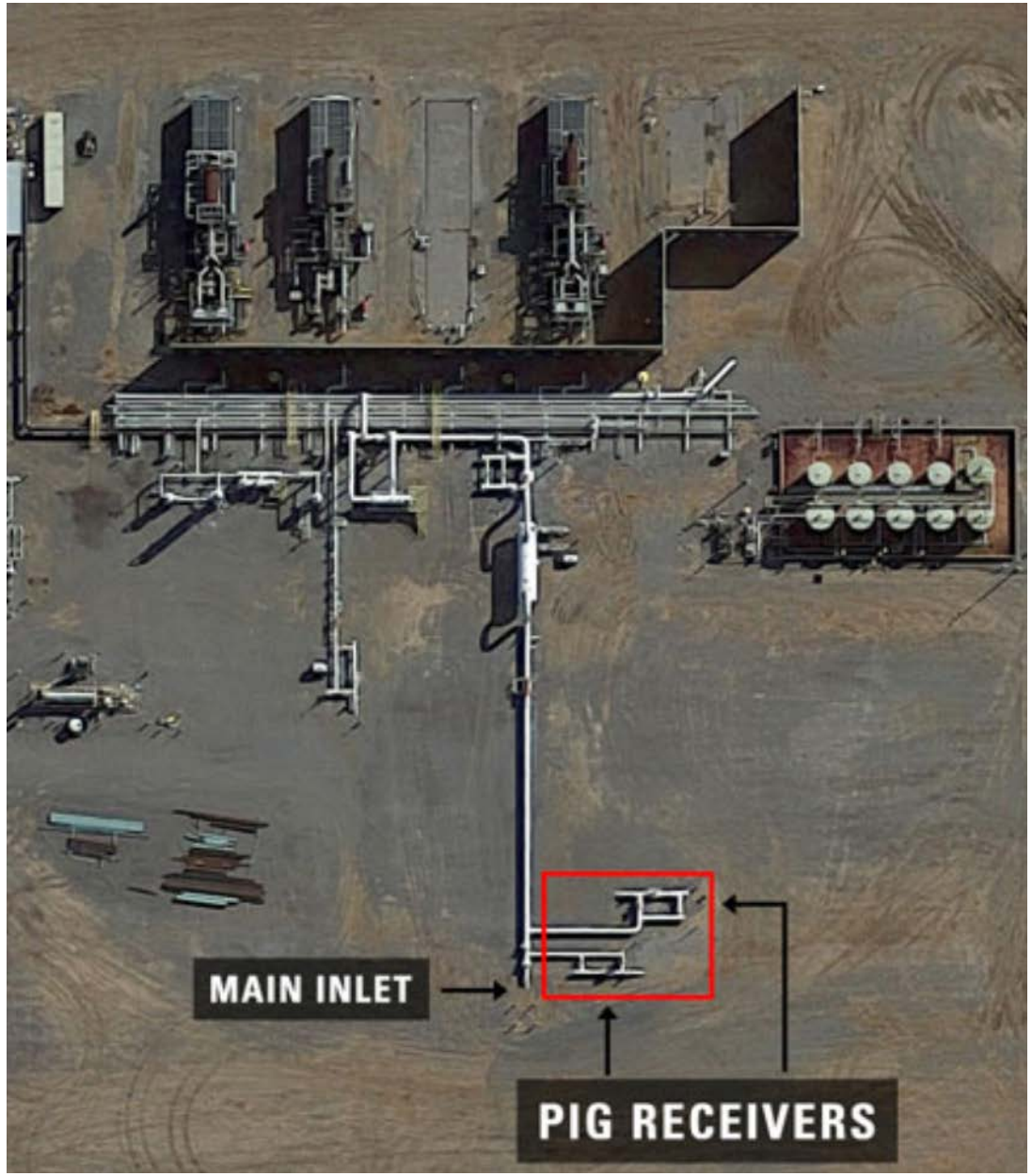
Source: PB-KBB, inc., enhanced by EIA.

Compression station yard. *Courtesy of Spectra Energy/PennStateExtension*



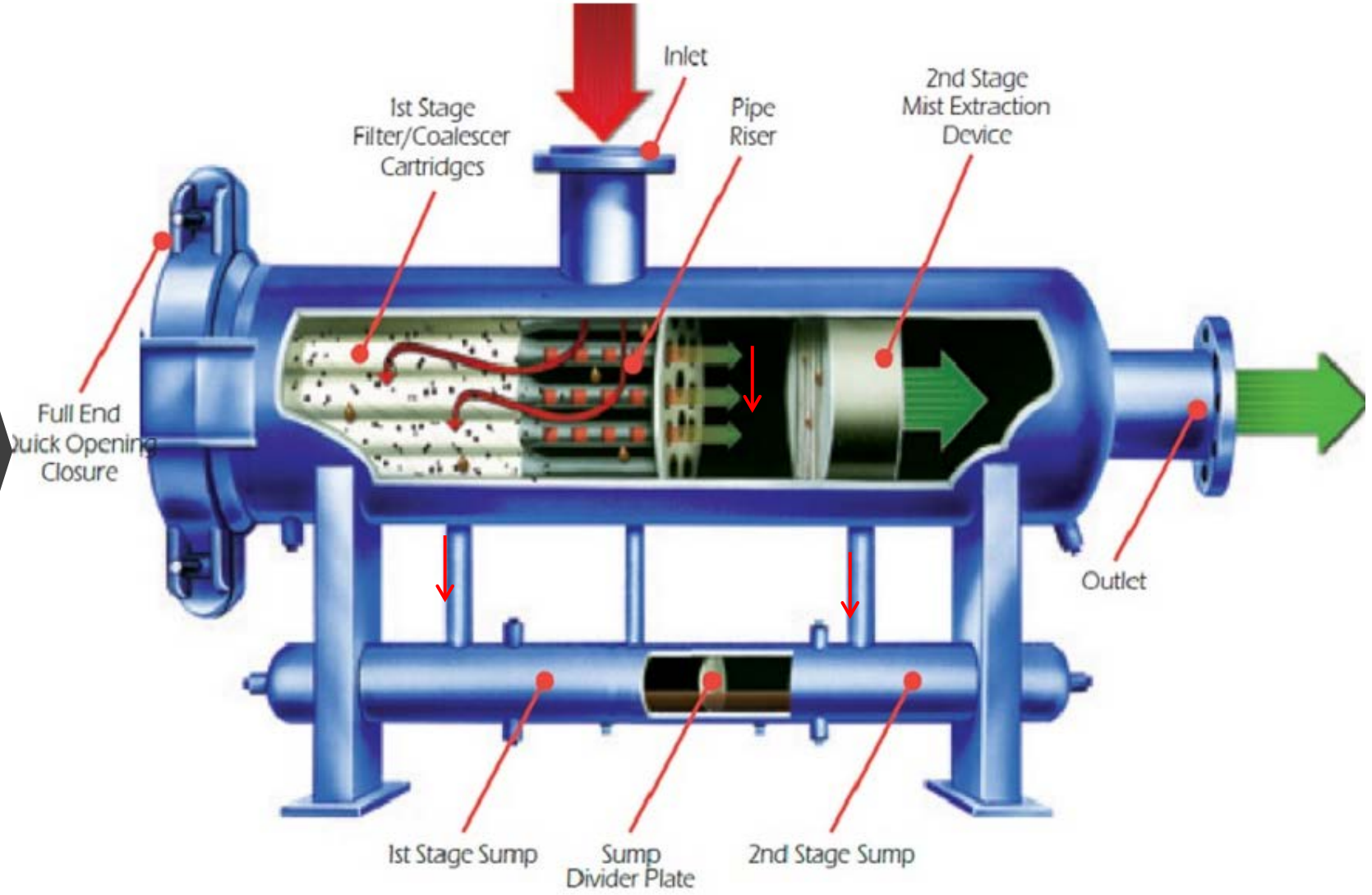
#	Description
1	Yard Piping
2	Filter Separators /Scrubbers
3	Compressors
4	Gas Cooling System
5	Lube Oil System
6	Mufflers
7	Fuel Gas System
8	Back up Generators

Compressor Station Overview



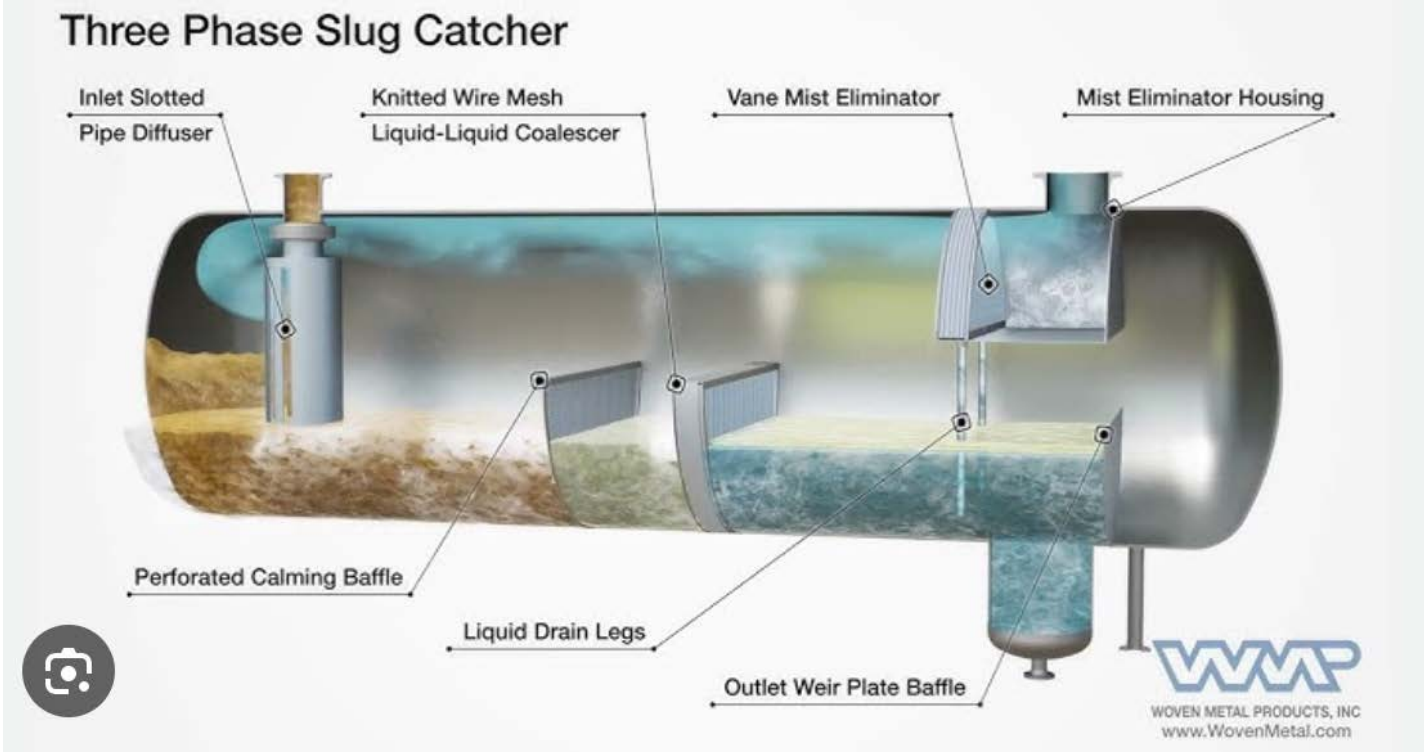
https://kimray.com/learning/oil-gas-equipment-101#gas-compressor-station

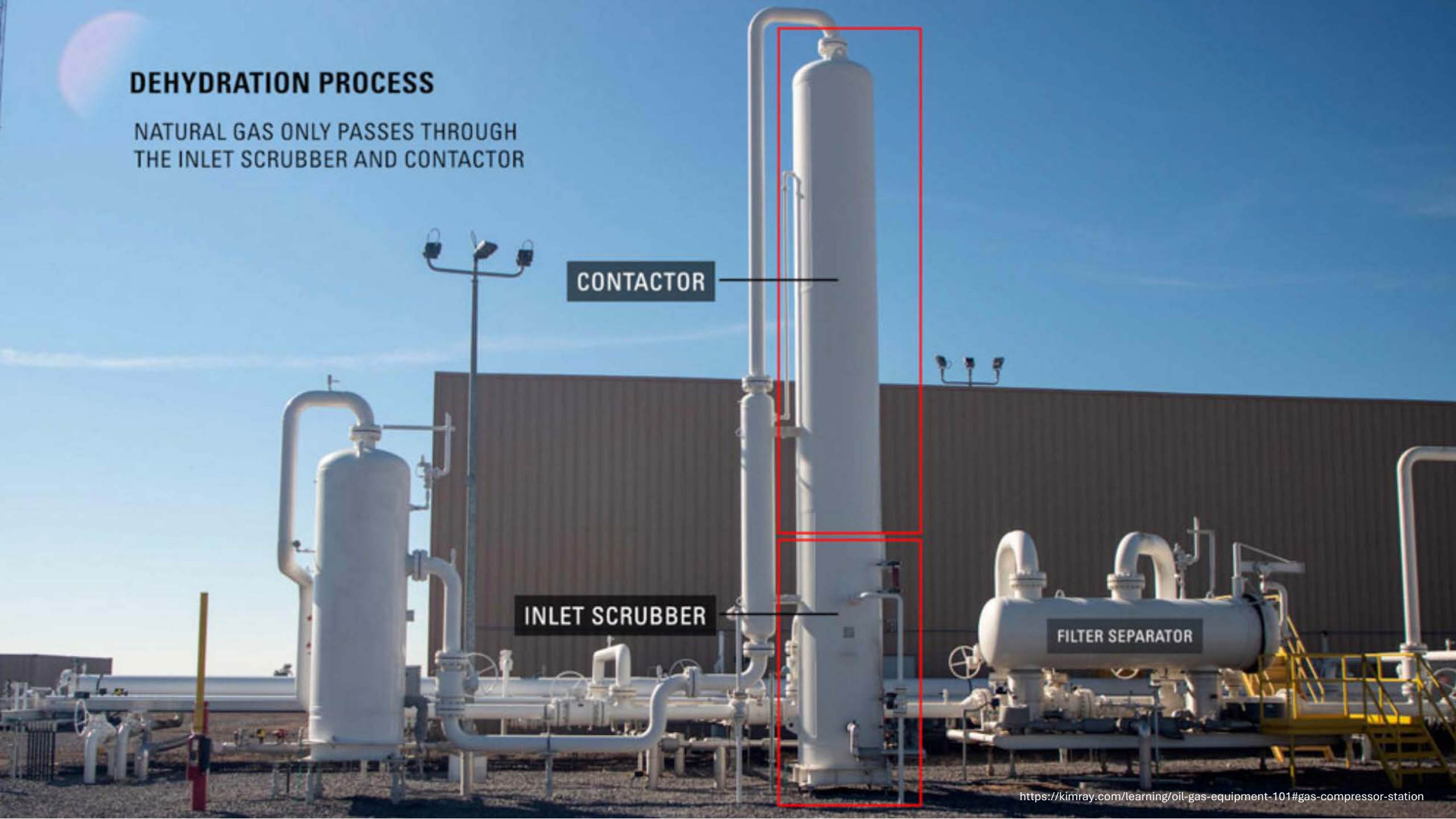
Filter Separator



https://www.parstechnic.com/Filter_Separator.html

Three Phase Slug Catcher





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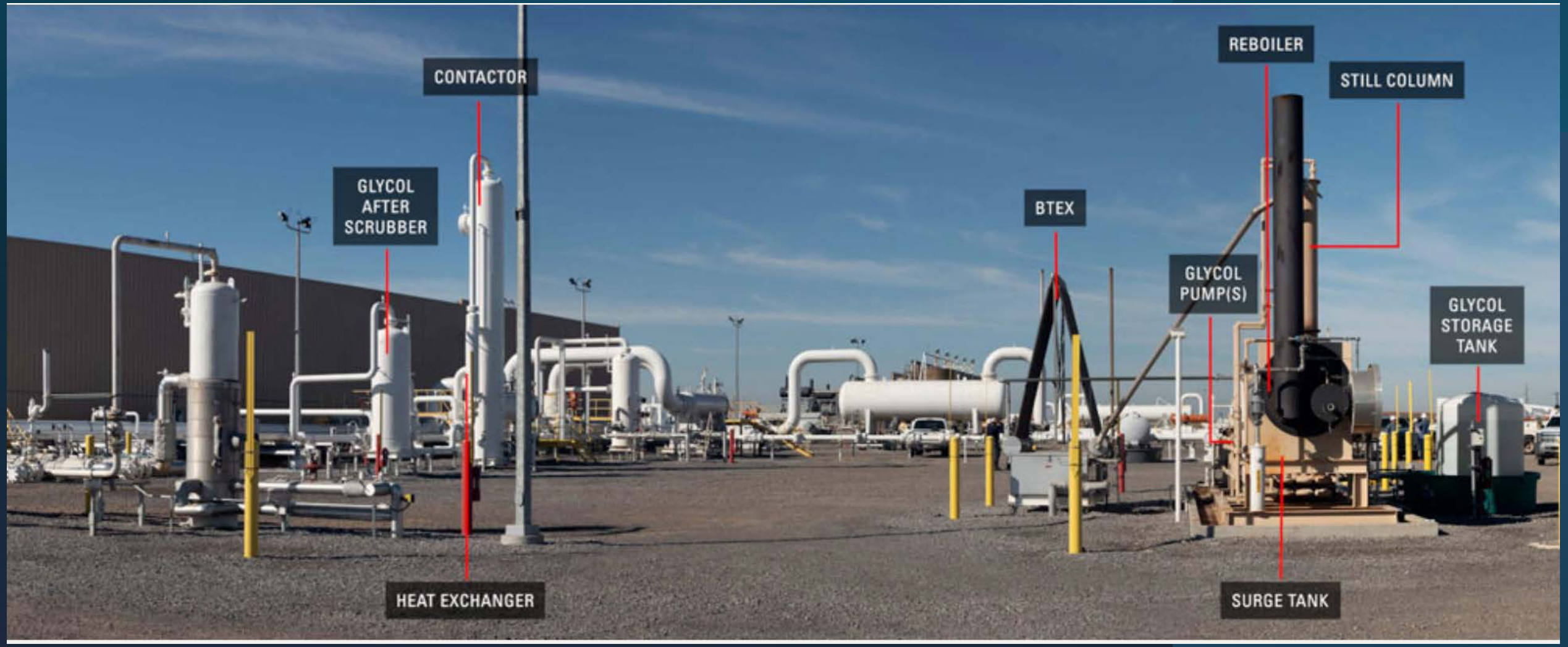

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Where Do I Find More Information?

- API –Primarily focused on petroleum and natural gas
  - 510 – Pressure Vessel Inspection Code
  - RP 572 –Inspection of pressure vessels
  - API 570- Inspection, repair, alteration and re-rating of in-service piping systems
  - API-579 Fitness for service assessment of structural integrity of piping and vessels
- ASME –Multiple industries, typically deals with design and inspection of new vessels and piping in Oil and Gas
- AMPP –Primarily corrosion and risk assessment

Lance Barton
EnhanceCo Inc.
LanceBarton@Enhanceco.net
417.204.1614 Cell
281.499.4426 Office

- Tom Pickthall
- EnhanceCo Inc.
- Tomp@Enhanceco.net
- 713.906.4841 Cell
- 281.499.4426 Office