HEAT EXCHANGER WORLD
CONFERENCE & EXPO
AMERICAS

Facilities Management Systems – Why you need this?

Facilities – Inspection and Testing

- Oil boom in early 1900's made owner/operators build plants, pipelines, facilities and this has made them continuously improve to meet Updates on the Regulatory, Codes, Health, Safety and Environments in Natural Resource Rich Areas such as Prairies in Canada.

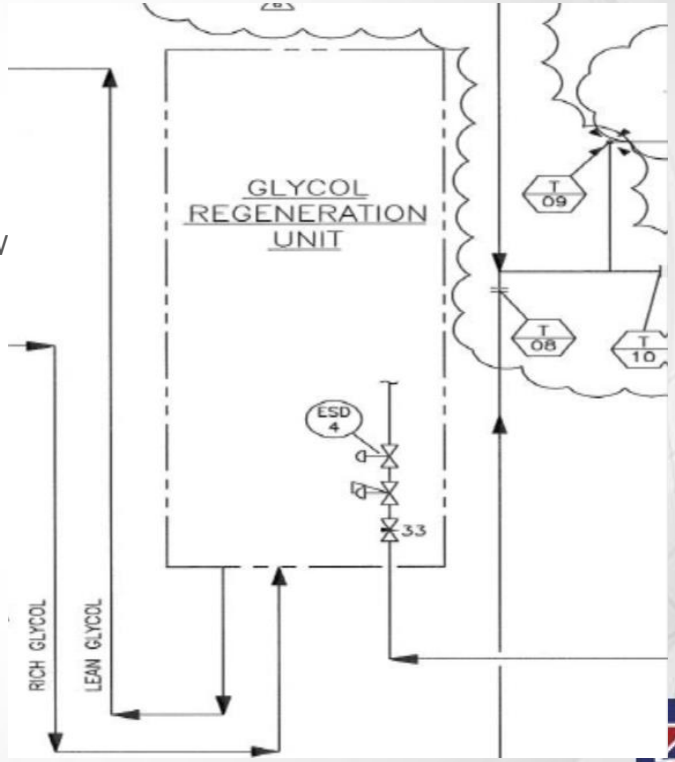
FAMS Projects on Legacy Assets Improvements

- FAMS – Facility Asset Management System
  - A plan to meet the minimum standards required to show due diligence.
  - Ensures that a professional engineer has certified our Facilities.
- Meeting Code requirements.
- Provides the required information to proceed with future plant improvements

North American Practices on Improvements to legacy/ existing Plants, Facilities.

FAMS Project

- Background:
  - Stations built in the 70's.
  - Drawings were incomplete.
  - Modifications and additions w
- Solution:
  - As-Built Drawings
  - Design Review
  - HAZOP Station- Hazard and Operability study
  - Shutdown Key Review
  - Management of Change



Plant/Station Results

- Project needs to be started at Any of the Existing Plant Sites, where we attention needed.
- Design review, HAZOP and Action items are complete.

Pressure Equipment Issues

- New Pressure relief valves.
- PRV pressure and capacities changed.
- Vessels were rerated for temperature.
- Piping spec breaks were protected
- e ac

Car Seal Issues

- Car seal additions:
  - Blow down isolation valves.
  - ESD bypasses.
- Car seal procedures and traini

  was improved.
- Improved Car seal documentat

Shutdown Key Improvements

- Shutdown Key Documented
- Protection Standardization.
- Block and hold concept:
  - Reduces vented gas
  - Faster restart
- Plant still blows down on:
  - ESD
  - Fire Detection
  - 40% LEL

- Multi Million dollar project for the Oil and Gas Operators
- Partial funding by the Canadian government
- Reducing fuel and vented gas in our compressor stations
- Utilizes Air Fuel Ratio Control and Slipstream
- Project Plan
- 25 units upgraded to AFR/slipstream
- 15 slipstream systems added to current AFR units.
- 7 AFR+SS and 5 SS to be installed.
- Currently have 28 operating AFR units.

- Integrated engine and compressor cont
- Air and fuel management
  - Compensates for ambient conditions and changes in fuel
- Reduces fuel consumption (~ 6%)
- Reduces NOX emissions
- Can use vented gas as Fuel

(Slipstream)

- Feeds vented gas into the combustion air.
- AFR reduces main fuel by the amount of added vent fuel.

Slipstreams

- Various sources can be captured.
  - Compressor packing
  - Instrument gas vents
  - Dehydrator flash gas
  - Utilizing station and unit outages to install equipment.

SlipStream

- Control system shows current and totalized flow.
- Currently saving $$ per month in fuel + credits.
- Plan to collect dehy flash gas as well.~$$ per month

Undiluted Pressure	0.100	Psi
Undiluted Valve AO	55.5	%
Status	Online	
Air Manifold LEL	3.6	%
Cumulative GHG (Since Reset)	4309.	$
Cumulative GHG (Since Reset)	287.0	ton Co2
Cumulative GHG (Since Reset)	57.0	cars/yr
Cumulative Fuel (Since Reset)	3506.0	$
GHG tonCO2(e) saving Per Month	78	ton/mon
GHG tonCO2(e) saving Per Year	953	ton/yr
GHG tonCO2(e) Cumulative	287.0	ton
Undiluted Vented GHG tonCO2(e) Reduced	953.0	ton/yr
Fuel Savings Per Month	956	$/month
Fuel Savings Per Year	11638	$/yr
Fuel Saved Cumulative	0.0	kg

Instant Total Supp Fuel Flow	175.8	kg/hr
Instant Total Supp Fuel Flow	6.0	E3M3/dy
Instant Main Fuel Flow	169.7	kg/hr
Instant Main Fuel Flow	5.8	E3M3/dy
Instant Undiluted Fuel Flow	4.8	kg/hr
Instant Undiluted Fuel Flow	0.1	E3M3/dy
Total Cumulative Mass Flow	0.0	kg
Total Cumulative Mass Flow	18.7	E3M3
Cumulative Undiluted Fuel Mass (Since Rst)	0.0	kg
Cumulative Undiluted Fuel Vol. (Since Rst)	18.7	E3M3
Cumulative Ttl Supp Fuel Mass (Since Rst)	0.0	kg
Cumulative Ttl Supp Fuel Vol. (Since Rst)	18.7	E3M3

Green House Gas (GHG) calculations based on $15/ton

Fuel saving calculations based on $5/gig

- Risk = Probability of Failure x Consequences of Failure (Risk = POF X COF)
- Lower Risk = Less Inspections
- Higher Risk = More Inspections(high frequency)

Current operation Plant Procedure Improvements

- Documented safety system bypass procedure.
- Improved Lock out tag out systems.
- Various improved operating procedures.
- Shut Down Keys.
- Plot Plan.
- Slip Stream/Energy Efficiency.
- Regulatory and current code compliance.
- BMS requirement/s
- De-bottlenecking project/upgrade.

Why we need Facility Management Systems?

Compliance with following:

- Labour Code
- Occupational Health and Safety Regulation
- American Petroleum Institute Codes and Practices
- ASME Boiler and Pressure Vessel Codes.
- ASME Code for Pressure Piping(B31.3)
- Pressure Equipment Safety Regulations(ABSA in Alberta, Canada)
- Canadian Standards Association Standards(e.g. Electrical code and Piping code)
- Manufacturers Standardization Society-Standard Practices
- CSA B149.3 Code for field approval of fuel related components on appliances and equipment

Questions?
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