

# What is the right Service Level Agreement for your Vapour Recovery Unit?

 **COOLSORPTION**  
THE VAPOUR RECOVERY SPECIALIST

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# Fjords HSE vision

Based on our work experience in oil, gas and terminal industry, HSE mind-set is **the most important value** for Fjords Processing employees.

We shall be known as leaders in HSE by preserving all resources, employees and strategic partners that in our **business can either directly or indirectly affect negatively the Health the Safety and the Environment.**

This will lead and facilitate our goal of achieving a consistent, world class HSE culture and continually improving HSE performance.

*(...from Fjords Processing HSE Policy)*



Unforeseen operational risks



Breach of environmental regulations, human rights and other non compliance to local and international legislation



Poor safety in design of Fjords products and services resulting in serious loss for our customers

# Consider consequences

What would be the consequences if your VRU is suddenly inoperable for three weeks?



**Problems can happen –  
even for the best  
prepared!**



# Select the right service strategy

## Reliability Centred Maintenance

### Corrective Maintenance (Reactive)

- Small items
- Non-critical
- Inconsequential
- Unlikely to fail
- Redundant

### Preventive Maintenance (Periodic)

- Subject to wear-out
- Consumables replacement
- Failure pattern known

### Predictive Maintenance (CbM\*)

- Random failure patterns
- Not subject to wear
- Critical equipment
- Preventive Maintenance induced failures

### Lifecycle Management (Proactive)

- End of Life strategy
- Retrofit jobs
- Aging failure analysis
- Survey visits

\*CbM – Condition based Monitoring

# Corrective Maintenance

## Asset Replacement Strategy

- Based on MTTR and MTBF

## Service Readiness Strategy

- Emergency Hotline – In case of a critical incident, troubleshooting and re-establishment service
- 8/5 Hotline – Immediately support within working hours
- 24/7 Hotline – Immediately support around the clock for all days in the year
- 24/7 Hotline with Emergency Call-out – On-site guarantee



# Preventive Maintenance

- On-site Preventive Maintenance Visits
- Periodic Remote Online Surveys

Remote On-line Surveys – for customers  
Where unplanned downtime is expensive



- **Advances:** To identify incidents in advanced (before planned on-site visits).
- **Periodically logging-on** to your VRU control system to make a system survey and document with a status report.
- **Minor adjustment** can be made online and major incidents can result in an immediately emergency call-out.
- **Advices in advance** of necessary replacement parts or just ensure that we are well prepared for the next service visit.

# Predictive Maintenance

Introduction of a “Black box” as known from cars, we are able to give you proactive advices

- 24/7 Automatic reporting of critical problems to our Hotline
- Faster response -> Reduce downtime
- Our vision: All critical equipment shall have KPIs to document performance and maintenance need.

Example of predictive maintenance:

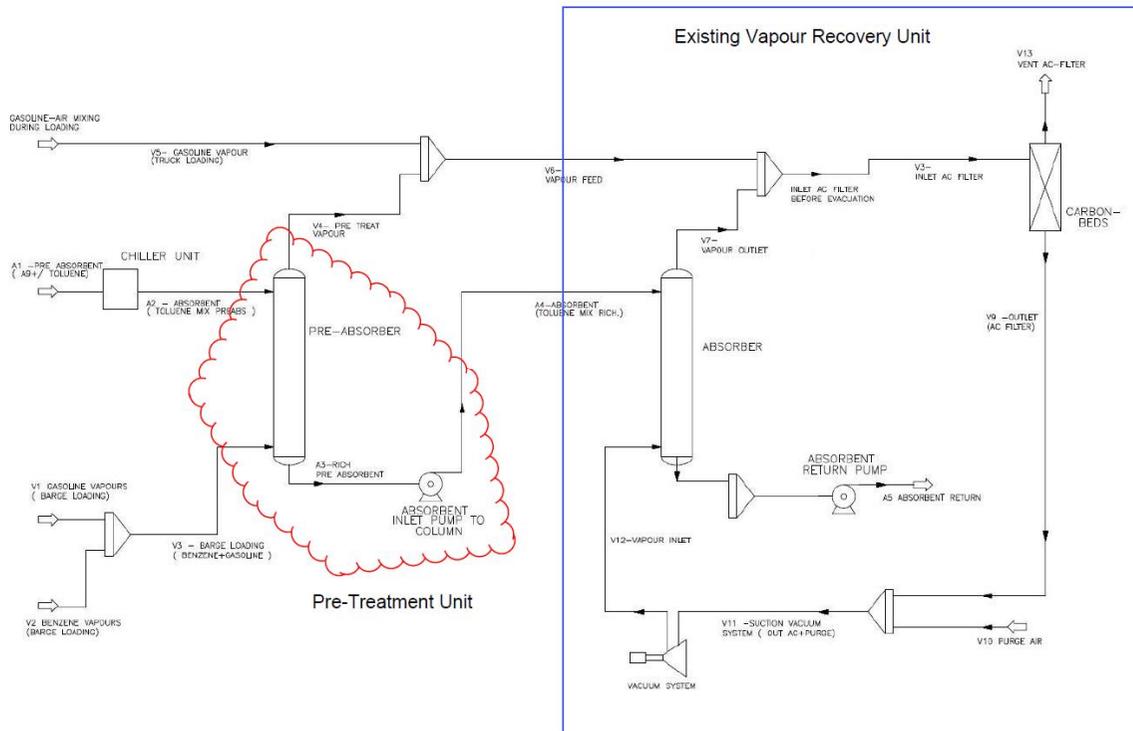
- Vibration measurement on VRU pumps – to predict in due time when to plan for overhaul



# Lifecycle Management & Retrofit

- Compliance with new emission legislation
- Increase of capacity
- Acceptance of off-spec vapours and/or absorbents
- Eco-mode: flowmeter or HC analyser etc.
- End-of-Life: SCADA & PLC upgrade packages

# Compliance with new Emission Legislation

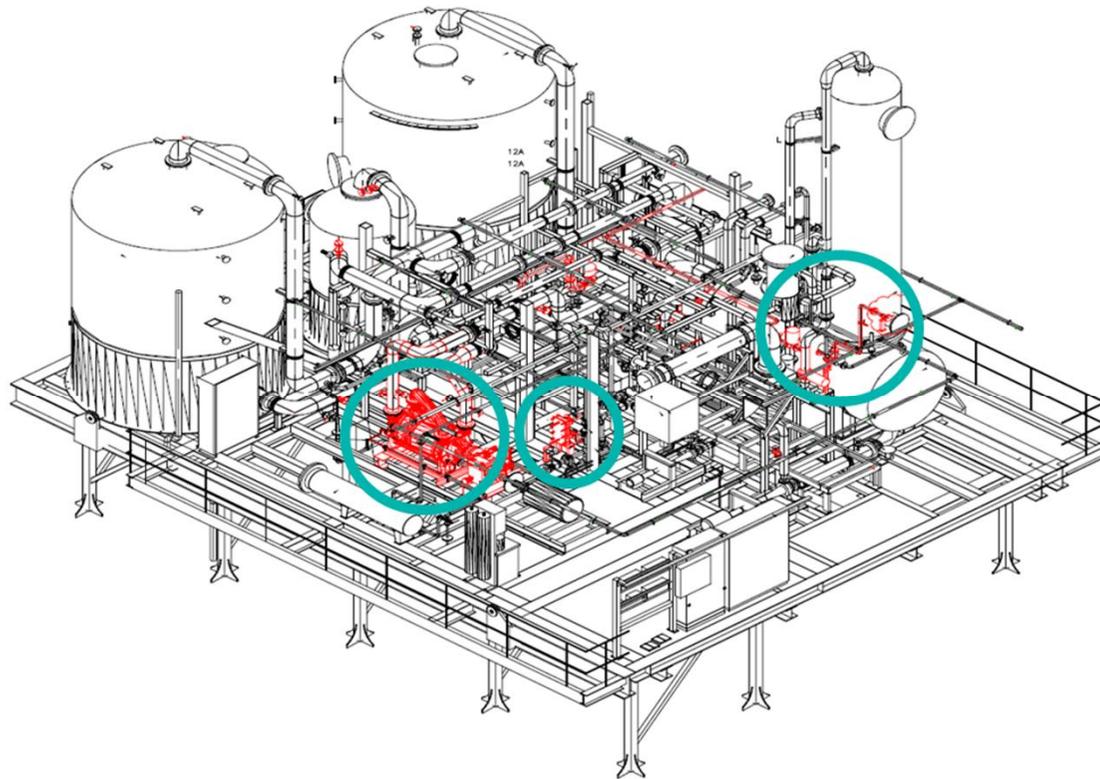


**Process Study**  
Evaluation of  
debottlenecking actions  
In order to enhance the  
emission performance  
of the VRU

**Example**  
For instance, in  
Netherlands, benzene  
emission  
limit passed down from  
5 to 1 mg/Nm<sup>3</sup>

**Solution:** A pre-treatment unit (such as a scrubber with a suitable absorbent) can handle the benzene content prior to come to the activate carbon system. In this way, the benzene emission is lowered to fulfil the emission limit.

# Example of Process Study on an existing VRU



Different capacity  
(respect to the design  
case)

- Different Vacuum System

Acceptance of off-spec  
products (respect to the  
design case)

- Heat Tracing
- Steaming adaption  
(piping, new control part)
- New cooling equipment

# ECO-mode - Controlling the VRU by flowmeter

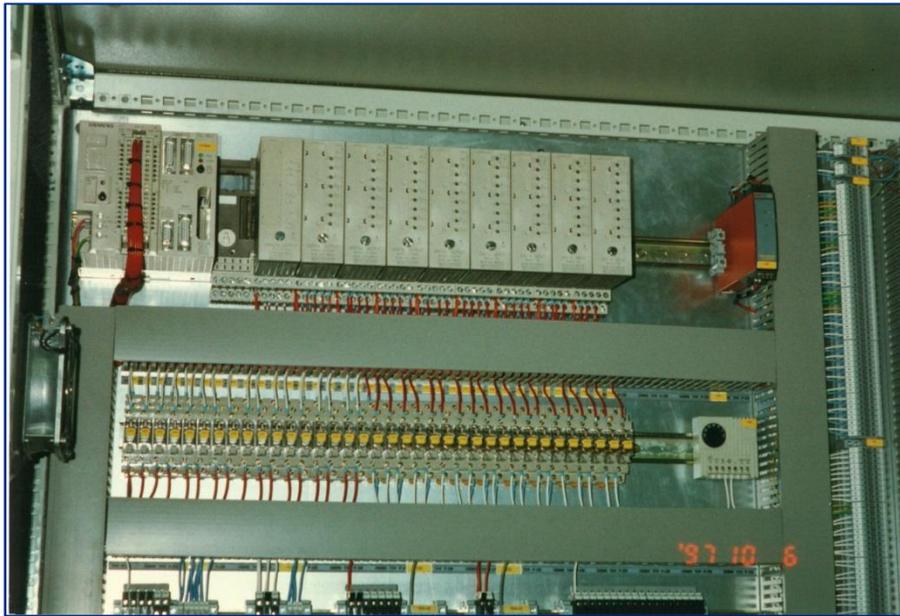
## Advantages

- Save energy costs – up to 50% savings
- Summarize flow.
- Much lower maintenance cost - Save wear and tear on all moving parts
- Possible to detect continuously the tightness of the whole vapour collection system, incl. vapour return hoses on the Gantries, since summarised flow is presented and stored on the SCADA system
- Payback time from 6-12 month



# End-of-Life replacement

Upgrade packages for obsolete hardware: for example Siemens PLC S5 -> S7



Before upgrade: S5 PLC

After upgrade: S7 PLC



# High focus on traditional and enhanced services

## Lifecycle Management / Brownfield / Debottlenecking / Modification

### Traditional

- Overhaul and recertification
- Debottlenecking studies
- Process optimization studies
- Onsite upgrades and modifications of existing equipment



### Enhanced

- Physical Modelling
- Fluids Characterization
- Test facilities
- Proposal for Best Available Technology for specific application
- Best Engineering Practice

For further information about our services, please contact:

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