

AMINE SYSTEMS REFINING APPLICATIONS HYDROTREATING

THE PROBLEM

For hydrotreater (Refer to Figure 1 on the following page) applications, the same processing challenges relative to the amine system described in the Application Note for Gas Sweetening also exist. These include:

- Foam in the amine contactor and regenerator
- Hydrocarbon undercarry from the amine contactor
- Rich amine contaminated with hydrocarbon from the flash tank

Challenges specific to hydrotreaters include:

- Foaming and emulsions in the high pressure and low pressure separators
- Hydrocarbon entrained in the sour water from the separators
- Hydrocarbon entrained in the sour water from the splitter reflux drum
- Water in the overhead product from the splitter
- Water in the bottoms product from the splitters

THE SOLUTION

Foam in the Amine Contactor or Regenerator

The Agar Foam Detector can detect the presence of foam far earlier than a ΔP cell, pressure gauge or other technologies.

The probe can initiate or increase the anti-foam chemical injection rate causing the foam to dissipate. As a result, the antifoam chemical feed rate is optimized, usually reducing the operator's overall chemical costs. Contamination of sales gas with amine or foam can be controlled while protecting downstream compressors.

Hydrocarbon Undercarry from the Amine Contactor or Regenerator

The Agar ID-201 probe can detect very low concentrations of hydrocarbon in amine solution in the bottom of the amine contactor or regenerator. In the case of the Amine Contactor, the hydrocarbon is drawn off to protect downstream equipment and to minimize the problems resulting from hydrocarbon contaminated amine leaving the contactor. For the Regenerator, an Agar OW-200 is installed to ensure that lean amine with minimal hydrocarbon content is sent out to the contactors for maximum absorption efficiency.

Rich Amine Contaminated with Hydrocarbon from the Flash Tank

Interface control in the Flash Tank will eliminate hydrocarbon undercarry with the rich amine going to the regenerator and acid gas stream.

Regenerator Reflux Drum

An Agar ID-201 may be installed for control or to initiate a low level alarm to prevent hydrocarbon from being fed into the regenerator from the reflux drum.

High/Low Pressure Separators

There may be foam or emulsion formation in the separators. Poor control of foam and emulsion are a source for hydrocarbon entering the amine contactor. Agar ID-201 and foam probes may be installed in the separators for interface and emulsion/foam control to prevent hydrocarbon entrainment in the gas phase. An Agar-201 probe may be installed as a low level alarm to detect hydrocarbon in the sour water phase.

Splitter Reflux Drum- Sour Water

An Agar ID-201 may be installed to control or initiate a low level alarm to prevent hydrocarbon from being drained into the boot of the reflux drum with the sour water.

Water in Hydrocarbon Product from Splitter Bottoms and Overheads

Water is a contaminant to the bottoms and overheads product from the Splitter and is referred to in the industry as haze. The Agar OW-300 can detect the water in the product stream so operational changes can be made to minimize the effect of water contaminating either to the final product or downstream catalysts.

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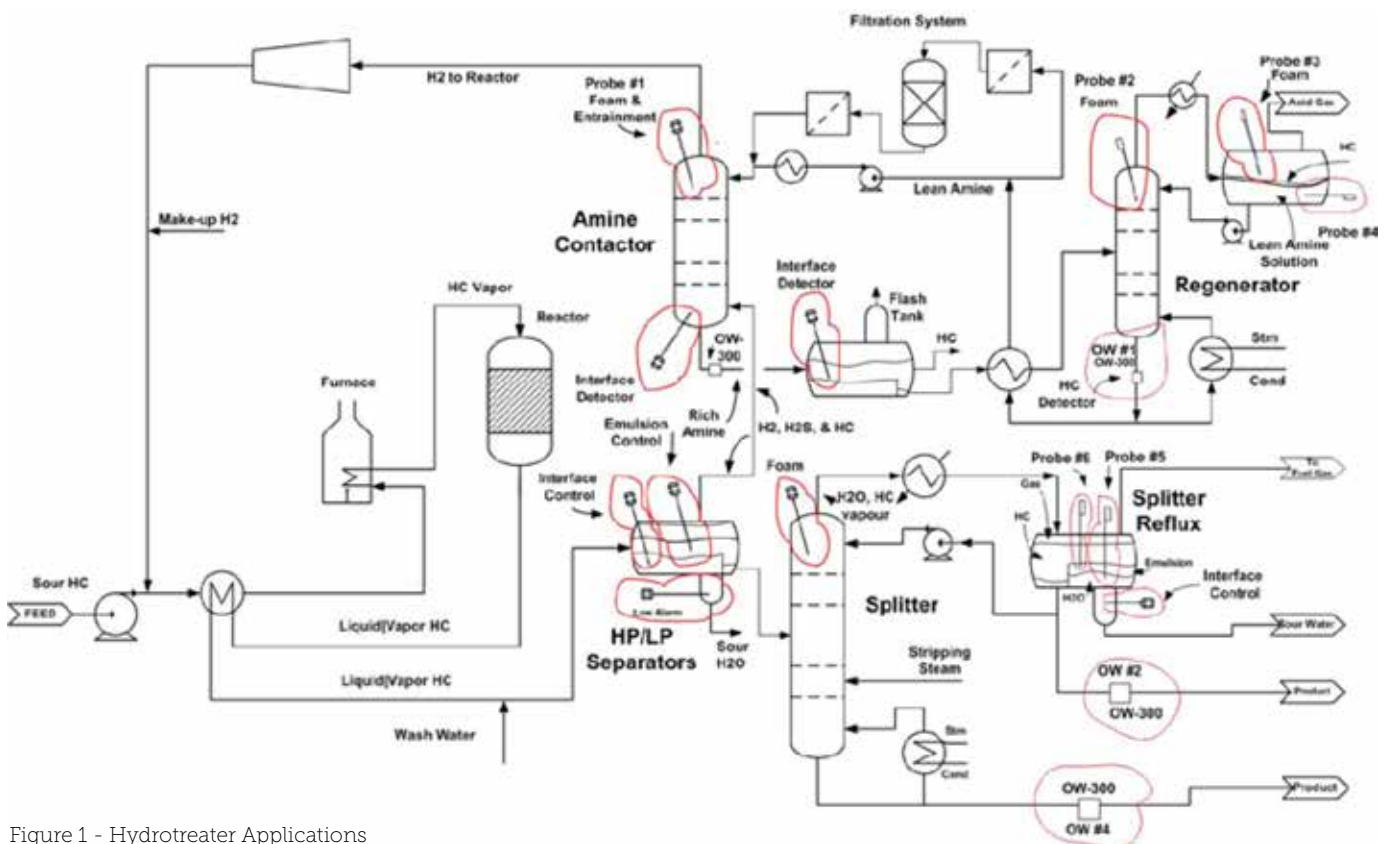


Figure 1 - Hydrotreater Applications