Sweet Solutions.™

MERICHEM COMPANY

LO-CAT® II PROCESS
CONTROLS H_2S EMISSIONS AT GEOTHERMAL PLANTS

The LO-CAT® II process is used to control H_2S emissions and reduce odors at geothermal power plants.

Geothermal steam, considered to be a clean and environmentally friendly source of energy, is produced when water seeps into high temperature, high pressure formations below the earth's surface. The steam is brought to the surface through production wells and then expanded through a turbine to produce electricity. Coming out of the turbine is the condensed steam and any non-condensible gases (NCG) associated with the steam. The condensed steam is usually pumped back into the underground formation.

The NCG is mostly carbon dioxide (CO_2) but, may contain up to 6% hydrogen sulfide (H_2S). If the H_2S concentration is very low, the NCG is usually vented to the atmosphere through the cooling tower. However, both the low odor threshold of H_2S and the current environmental laws strictly limit the amount of H_2S that may be vented into the atmosphere.

The LO-CAT II system provided by Merichem is the ideal desulfurization process for geothermal NCG. The system features H_2S removal efficiencies over 99.9%, excellent performance in turndown conditions for both H_2S concentration and NCG flowrate, and easy operations requiring only limited operator attention.

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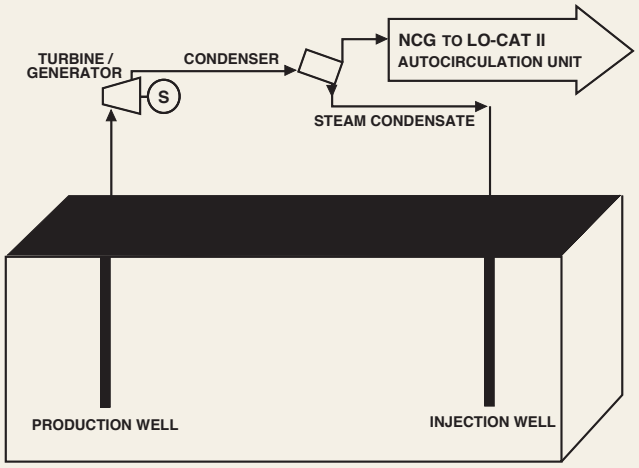
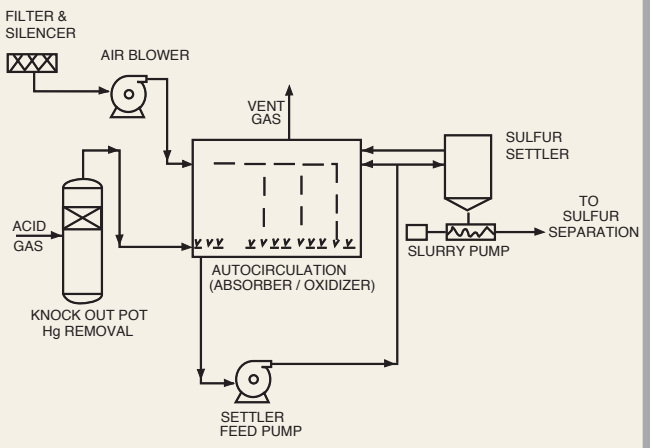
Geothermal Power Applications
Non-Condensible Gas (NCG)



Typical geothermal power plant operation.

LO-CAT® II Autocirculation Unit



LO-CAT II Autocirculation unit including upstream mercury removal.

The LO-CAT® II process offers a low-cost, high-efficiency, flexible method for removing H_2S from geothermal non-condensible gases achieving 99.9+% H_2S removal efficiency.

The LO-CAT II process converts H_2S to innocuous, elemental sulfur using a paten-ted, dual chelated iron catalyst which is environmentally safe. The overall process reaction is:

$$H_2S + \tfrac{1}{2}O_2 \xrightarrow[(Fe)]{} H_2O + S°$$

Oxygen used in the process comes from air which is bubbled through the catalyst solution. Because the chelated iron catalyst is not consumed during the reaction, only modest amounts of catalyst are added to the process to replace mechanical losses. A small caustic addition is required to maintain the catalyst solution in the mildly alkaline pH range. Also, additional chelates are added to replace chelates that degrade over time.

Flexibility is especially important at multiple well sites where production from individual wells is intermittent resulting in a constantly fluctuating NCG flowrate and composition. Also, the NCG composition from most geothermal formations will change over the life of the site.

The highly flexible, patented LO-CAT II Autocirculation design handles fluctuations in both H_2S concentrations and NCG flowrate with little or no operator attention.

Only the LO-CAT II process offers geothermal steam producers a desulfurization process with high efficiency, economical operating costs, and easy operations using an environmentally safe scrubbing solution.

The LO-CAT II system converts H_2S to a harmless sulfur cake.