Collection, Transport & Incineration Of Noncondensible Gases

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INTRODUCTION

Kraft pulp mills are typically characterized by a distinct foul odor. This odor is caused by sulfur compounds, referred to as Total Reduced Sulfur (TRS). These gases are generated in Kraft pulping process. TRS can also be generated in direct contact evaporators, in recovery boilers, and in lime kilns. There are four constituents of TRS gases: hydrogen sulfide (H_2S), methyl mercaptan (CH_3SH), dimethyl sulfide (CH_3SCH_3), and dimethyl disulfide (CH_3SSCH_3).

TRS gases are emitted from several processes in the Kraft pulp mill. The highest concentrations come from the digesters, evaporators, turpentine system and condensate stripping system. Lesser concentrations are emitted from the brown stock washers, condensate tanks and liquor storage tanks. The vent gases are collectively referred to as Noncondensible Gases (NCG).

The first attempts to contain these odorous gases were in the late 1950's. Initially systems collected and transported all forms of NCG in a single pipeline with a fan as motivation. Additional ambient air was added to ensure the TRS concentrations were below the lower explosive limits. This was not always successful, especially with concentrated gases coming from digesters and evaporators. The results were that many early systems experienced fires or explosions.

In the early 1970's advances were made to keep the NCG undiluted. With the smaller gas volumes steam ejectors could be used to motivate the NCG. These systems virtually eliminated explosions in NCG systems and became the precursor for the present day accepted method for handling NCG.
NCG also contains other pollutants, such as turpentine and methanol. These gases are classified as Hazardous Air Pollutants (HAPs). Environmental Regulations also require the collection and destruction of HAPs.

The steam ejector-based NCG systems have been so successful and reliable that the Environmental Regulations in the United States require all Kraft mills to have NCG systems and to operate them at 99% uptime.

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