API/OMB Meeting – EPA's Risk Management Plan

June 23, 2022

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HF – What Is It?

- Hydrogen Fluoride (HF) is a colorless gas or liquid chemical compound. HF is the principal industrial source of fluorine and, when dissolved in water, is known as hydrofluoric acid
  - HF acid is mainly used for industrial purposes (e.g. glass etching, metal cleaning, electronics manufacturing)
  - HF acid is used in refineries as a catalyst in the alkylation process to form alkylate, which is a blending component in high-octane gasoline, jet fuel, and marine diesel fuel

HF – A Brief History

- HF has been safely used in refineries since World War II, when alkylate was first required in aviation fuels
  - Only 2% of HF acid in U.S. is used in refinery alkylation
  - Of the 120+ operating refineries in U.S., nearly all have some form of alkylation unit – 42 of which use HF acid
- There have been few HF releases with off-site impacts; there has never been an off-site fatality in the U.S. due to an HF release
- Other types of commercially-proven refinery alkylation technologies include: modified HF (MHF), sulfuric acid alkylation, and ISOALKY

HF – Why It Is Important

- Alkylate is the ideal blend stock for gasoline to meet clean fuel regulations
  - Alkylate has high-octane (92-97 RON) and low Reid Vapor Pressure
  - Alkylate helps reduce emissions from automobiles due to its low sulfur content and its very low benzene content
- HF alkylation is not interchangeable with other refinery alkylation process technologies
  - HF alkylation does not require refrigeration
  - Regeneration of HF does not produce SO_2/SO_3 emissions
  - Revamp to other commercially-proven technology is prohibitively expensive and would require at least a 2-6 month shutdown

What Are API Members Doing?

- Refineries adhere to strict industry standards and undergo safety assessments to mitigate risk and assure safe operations
  - Refineries employ operational standards and mitigation systems, including those covered by API RP 751, *Safe Operation of Hydrofluoric Acid Alkylation Units*
  - The 5th edition of RP 751 was published in August 2021 and significantly expanded the Materials, Fabrication, and Inspection and Maintenance Practices section
  - PSSAP Program

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Representative Sampling

- Industry is highly-regulated and facilities have multiple RMP covered processes. Therefore, it is not necessary to audit each covered process if it includes a representative sample
  - Employing sampling as part of the audit process is a robust, scientifically proven, method of demonstrating that all covered process and all RMP elements are compliant
  - The refining industry is extraordinarily complex and highly involved. Auditing *all* covered processes and all RMP elements requires not only significant resources but is very disruptive to operations
  - Most facilities have only one process, but certain industries, such as chemical manufacturing and petroleum refining, often have more than one regulated process; about 100 facilities have more than 10 regulated processes with an average cost of $36,500 per process

QUESTIONS OR COMMENTS?

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