Question 71 Is your company planning to install modified HF acid capability (usage of the volatility suppressing additive)? What are the incentives for doing this? What alternatives have you considered?

METKA (Sunoco, Inc.) In March 2006, in our continuing effort to support safe, reliable, and environmentally sound operation, we announced our plans to apply for a permit to independently initiate an alkylation process improvement project in our Philadelphia HF alkylation unit. The unit employs ConocoPhillips, now UOP, Split Olefin Feed Technology (SOFTTM), and the project includes voluntary incorporation of a modified acid capability. ConocoPhillips ReVAP® technology was selected for the project. As most of you are probably aware, this technology was later acquired by UOP. We had been evaluating the incorporation of modified acid technology for several years in order to determine if the technology could be applied without contributing to reliability or other operational concerns. Other options were considered and ReVAP® was selected based on demonstrated commercial application. The additive used in the modified acid technology reduces acid volatility, which provides several benefits. It provides a passive mitigation system that further enhances existing safety measures. Transportation risks are also reduced since the additive can be blended prior to shipment. Modified acid technology is one ingredient of an extensive safety program and it compliments other acid management systems, which include extensive inspection, maintenance, and equipment monitoring programs, existing active mitigation systems, feed quality control through selective hydrogenation, an online HF analyzer for continuous acid monitoring and control, and a rapid acid de-inventory system. The technology also compliments the planned implementation of compartment technology, which is another passive system, including a baffle in the settler that reduces the amount of material available in the unlikely event of a release. Other potential benefits include decreased acid usage and also slightly higher alkylate octane.

QUINTANA (Valero Energy Corporation) This response focuses more on the latter part of the question related to alternatives, which John has already touched on with a good start. We see vapor suppression additives as only one option of several available for consideration as part of a comprehensive Process Safety Management (PSM) program. The industry recommendations to consider are summarized in API Recommended Practice 751 for Safe Operation of HF Acid Alkylation Units. We believe an effective program will comprise of recommendations emphasizing leak prevention and monitoring, as well as the mitigation systems to be used in case of a leak event.

There are various elements recommended under RP 751 that are included in The Answer Book and the next three slides, so I will not go over them in detail here. The key elements include procedural aspects such as HAZOP assessments, MOC (Management of Change) programs, emergency response and control plans, and regular unit audits.

API RP 751 Elements:

•HAZOP assessment of existing unit equipment & controls

–per API RP 750 - Management of Process Hazards

•Management of Change program to address controls, instrumentation, metallurgy, procedures, relief system

•Thorough emergency response and control plan

Regular and thorough unit audits to address:

- Unit specific & industry incidents and risk exposure in the unit
- Inspection, maintenance & training records
- Mechanical & procedural changes since previous audit
- Testing & maintenance of detection, monitoring, control systems
- Testing & maintenance of mitigation systems in case of a leak
- Procedure compliance, understanding via observation, interviews
- Technology developments that further reduce accident risk

There are also equipment aspects, including regular equipment inspections, confirmation of correct metallurgy viamositive material inspection (PMI) programs, use of reliable instrumentation and minimum acid inventory, and then the mitigation systems.

API RP 751 Elements:

•A comprehensive program should include (continued):

–Regular and rigorous equipment inspections to confirm integrity of unit equipment, especially acid containing equipment

–Use of correct metallurgy

- per NACE 5A171

•Confirmation with Positive Material Identification program, especially in case of repairs or changes to equipment, piping

–Tracking mechanism to ensure resolution, close?out of identified issues

–design tracking system to facilitate next audit

–Reliable level instrumentation systems less prone to fouling, such as nuclear, radar, ultrasonic or magnetic

–Minimum acid inventory

–Mitigation systems

These mitigation systems can include a variety of active and/or passive elements along with tell-tale components. The main active mitigation system components include water deluge or curtain systems, remote monitoring and activation systems, and rapid dump systems to limit the quantity of any leak and

contain the leak to the unit area. Vapor suppression additives fall under the passive mitigation category and can be considered along with all of the other possible elements available as part of a PSM program.

API RP 751 Elements:

Mitigation systems can include active and/or passive elements as well as tell?tale components:

- HF detectors can be point, open path or imaging systems
- Install as needed in unit risk envelope
- Acid sensitive paint on flanges, pump seals, etc.

Active mitigation systems can include:

- Water deluge and/or water curtain systems
- Remote video monitoring and remote activation, isolation systems
- Rapid dump system to contain acid, limit the extent of the leak

Passive systems can include:

- Barriers & catch pans to contain acid release
- Minimum acid inventory control & staging in equipment
- Vapor suppression additives

Each facility should assess its own location-specific risk profile and develop a mitigation strategy that includes the elements that together effectively minimize those risks while conforming to the applicable regulations for that facility.

API RP 751

Conclusion:

- Each facility should determine their location
- specific risk factors, and assess the appropriate combination of active and/or passive mitigation systems needed to minimize risks involved in operating the unit
- Local, state and/or federal laws and regulations should also be reviewed

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