
Question 31: In HF alkylation units, do you have two vent gas or flare gas scrubbing systems, one for normal operation and one for a rapid acid dump system?

Erik Myers (Valero)

Each of our units has one system. Most units only route acid containing reliefs to the Acid Relief Header which has a Neutralizing system as part of that. The dump drum relieves to the Acid Relief system. The acid relief neutralization system should be carefully reviewed to confirm it is adequate for this case, especially if the dump system has been installed after the original unit and relief neutralization system was commissioned. API Recommended Practice 751 should be referenced for design and operating considerations of these systems.

Praveen Gunaseelan (Vantage Point Consulting)

The question is implicitly about HF alkylation, since rapid acid dump/de-inventory systems are typically considered for HF alkylation units, not for sulfuric acid alkylation. Due to differences in HF alkylation unit designs, it would be prudent to discuss this question with the alkylation process licensor or a qualified engineering contractor.

During normal operation of alkylation units, the acid blowdown system typically serves as a collection point for acidic vapors that are to be vented or flared. Vapors from the acid blowdown system are neutralized in a scrubber prior to venting or flaring.

For HF alkylation units outfitted with a rapid acid dump system, API Recommended Practice 751 advises that “vessel or vessels receiving the acid may require provision for venting and neutralizing of vapors generated during the movement of the acid”. Discussions with industry experts indicated that provision of venting and scrubbing for rapid dump systems is a site-specific design consideration, and currently a majority of existing rapid dump system installations do not have a provision for venting. The few rapid dump system installations that are provisioned with vent systems tend to have dedicated scrubbers.

Brad Palmer (ConocoPhillips)

The common unit configuration is only one Relief Gas Scrubber (RGS -- UOP design) or Acid Relief Neutralizer (ARN -- Phillips design). An acid dump system should not have excessive venting if designed and operated properly; however, there are a few units that have a separate scrubber dedicated to the acid drum.

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