
Question 4: What are the requirements for a unit depressurization valve in isom unit using a chlorided alumina catalyst based? Do you require the depressurization valve to be operable from the console and/or emergency shutdown device (ESD) panel?

GAYL MERCADO (Axens North America)

Axens recommends that in cases of emergency depressurization of the reactor circuit, the circuit fluid is depressurized into the product stabilizer with the light gases still being treated in the off-gas caustic scrubber before being sent to flare.

An Isom unit is typically designed such that there are several automatic shutdown process interlocks that will place the unit in a non-hazardous status should a major failure occur. An emergency shutdown hand switch that is not an automatic shutdown, but a board mounted hand switch that can be used at the discretion of the operator, is also a standard design philosophy. Should an emergency occur (e.g., temperature runaway in the reactor, fire), the operator has the capability to activate this switch which will initiate an emergency shutdown. It should be noted that care should be taken to protect pressure safety and emergency depressurization valves in the reactor circuit to prevent corrosion of the valve and subsequent loss of relief capabilities.

The depressurization valve can either be operable from the console or an ESD panel based on site preference or company standards. At minimum, the valve should be operable from an ESD Panel. If the valve can be operated from the console, safeguards should be in place to prevent unintended depressurizations.

CHRISTIAN ARNOUX (Valero)

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- One licensor is adding Rx depressurizing to new Isom units
- The first step in depressuring an Isom Rx should be through the net gas caustic scrubber to fuel
- Keep adequate positive pressure to prevent back flow from the fuel gas system

In UOP's current design of a Hydrogen Once Through (HOT) Penex™ or Butamer™ unit, dual (2) depressurization valves are located at the outlet of the Lag (or Last) Reactor into the flare header. Two valves are specified to prevent HCl leakage into the flare header. The valves and line sizes are sized appropriately to meet a target velocity during a depressurization event.

The valves are opened when the reactor depressure Emergency Shutdown (ESD) is initiated from the board-mounted hand switch. UOP recommends flushing the flare header with dry nitrogen after the depressuring ESD to purge the HCl containing hydrocarbons that would be in the flare. This is a preventative action to minimize flare corrosion.

For revamps of existing units, UOP recommends, but does not require a retrofit using the current reactor de-pressure ESD.

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