

Incident Learning: LOPC (sour gas) release via RV

BRIEF DESCRIPTION OF EVENT

- During emergency shutdown of the Sulphur Recovery Unit (SRU), a unit field operator reported a leak to atmosphere from an acid gas relief valve (RV) which is routed to the H₂S Relief system (HSR). The spare RV was installed in the spare position and the leaking RV isolated. The leaking RV was stripped at the workshop and found to have NOT lifted.
- There was a back pressure resulting in reverse flow of the SRU sour gas release through the RV in question. This RV has a slotted bonnet with a vent/drain hole of 10.3mm diameter. The sour gas found its way to the bonnet of 84RV1 which in turn vented to atmosphere.
- A LOPC was logged and there were no injuries. The extent of the LOPC was 139kg(total)/128.4kg(H₂S). This was classified as an API Tier 1 incident.
- It was found that the wrong type of RV was installed via MoC. The installed RV is normally used in Steam only applications. Although steam relief was the determining case for the RV, the other relief cases needed to be considered when selecting the open vs closed bonnet.

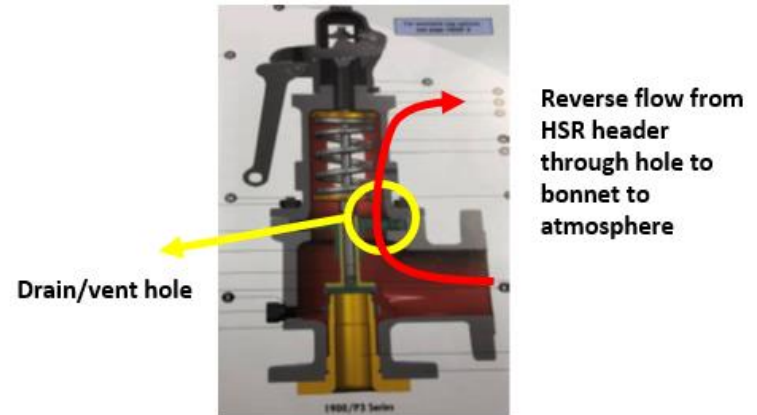
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RV



Drain/vent hole: d=10.3mm



KEY LEARNINGS

1. RV selection is critical and any potential release to atmosphere must be fully interrogated.
 - Only 100% innocuous processes (steam) can have open bonnet type RVs which vent to atmosphere to safe location.
 - Any RV connected to an upstream or downstream hazardous or toxic system must have a closed bonnet.
 - Furthermore all RVs connected to a closed discharge or flare must be of closed bonnet type.
2. Management of Change procedures must be adhered to.
3. All critical safety equipment must be reviewed and approved by company staff before procurement.
4. Information provided as part of the plant change proposal can be misconstrued and therefore it is important to scope the proposal succinctly, without ambiguity and comprehensively.
5. Field punching checks to be robust and clear.