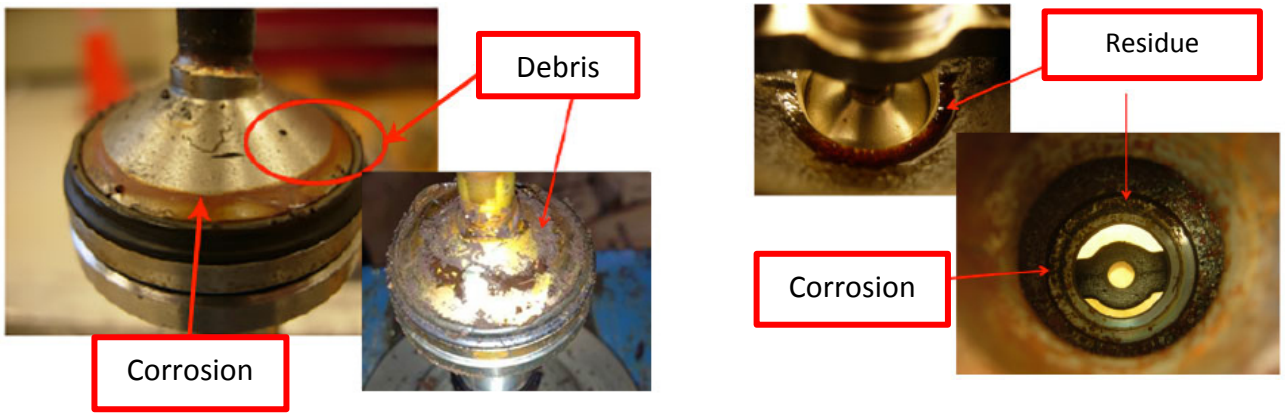
Vacuum Relief Valve (VRV) Application Alert –
Misuse of VRVs in Crude Oil, Unit-Train Service

This alert is to provide a warning to our customers about the potential misuse of VRVs in crude oil, unit-train service. It has come to our attention that some facilities are misusing the VRVs as vent valves during the unloading process. This practice can damage the valve and result in leaks.

Misuse may cause the VRV to be open for longer intervals than intended—potentially during the entire unloading of the car — during this time, allowing debris from the atmosphere to contaminate the VRV. This resulting in residual foreign substances and corrosion that lead to improper sealing and leaks.

Examples of debris, residue, particulates, and corrosion in a VRV.



Improper Venting

It has come to our attention that, in some cases, operators may not be properly venting tank cars during unloading operations. More specifically, in those instances, we have observed that operators purposefully do not open the manway or vent valves (the approved methods for venting tank cars during unloading operations) and instead improperly use the VRV alone as the means to vent the car.

Design Intent

Midland VRVs are designed to prevent the catastrophic failure of tank cars, which can be caused by excessive reductions in internal pressure. They are NOT intended to be the primary method used to vent tank cars during unloading operations. Manways and vent valves that

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have been specifically designed for this purpose should be the primary venting methods deployed during unloading operations

AAR Tank Car Practices

The AAR Tank Car Manual correctly states that a vacuum relief valve is "[a] pressure relief device designed to admit air to prevent an excessive internal vacuum and to reclose after normal conditions have been restored." (AAR Manual of Standards and Recommended Practices – Specifications for Tank Cars, M-1002, Appendix A)

Misuse of VRVs as a means to vent tank cars during unloading is in direct conflict with the industry recommended practices in Pamphlet 34 and the industry's design standards. Misuse of VRVs for venting purposes may result in the creation of hazardous operating conditions for site personnel and surrounding communities.

Recommendations

We recommend that customers review CPC 1245 and the AAR's recommended practices for properly unloading tank cars in an effort to mitigate damage to VRVs and non-accidental releases (NARs) associated with misused VRVs.

AAR details the proper loading and unloading procedures in Pamphlet 34: *AAR CPC 1245, Pamphlet 34, Recommended Methods for the Safe Loading and Unloading of Non-Pressure (General Service) and Pressure Tank Cars*. In particular, **Pamphlet 34 recommends using a vapor-recovery system (Sec. 2.1.15) and specifically states that *VRVs should not be used to vent pressure* (Sec. 3.1.63).** The pertinent sections of Pamphlet 34 are referenced below:

2.1.15	Where applicable, connect the vapor valve to a recovery system. Open the vapor valve for displacement of the vapor before opening any product valve or manway.

3.1.6.3	If necessary, vent to a scrubber or vapor collection system. *NOTE: CAUTION should be exercised because any tank car may be under pressure.* *NOTE: The vacuum relief valve should not be used to vent pressure.* *NOTE: Atmospheric venting may create a safety and/or environmental hazard.*

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