

Understanding the impact of flange guards on hazardous area zoning

The use of flange guards is becoming more prevalent in the chemical industry, including where the formation of flammable mists can create the potential for an ignited release. Flange guards provide a surface for sprays of liquid to coalesce, removing fine droplets that could present an ignition risk.

While some might argue that installing flange guards removes the hazard, and therefore the hazardous area zone, it isn't that simple. In this article we discuss the challenges associated with flange guards and highlight the implications of this equipment on risk management.

Flange guards can appear to be a quick fix and an easy way to reduce the extent of hazardous zones, but it is important to consider that there is limited information available on their use and applicability. There is also limited evidence of their functionality, i.e. testing to ensure they perform sufficiently. The impact of flange guards on hazardous zoning requirements is also unclear within industry guidance, and there are no internationally recognised standards for this equipment. It is therefore imperative that careful consideration is given to the potential impacts on major accident hazard management where flange guards are installed.

Flange guards may indeed remove the hazards associated with flammable mist formation on pipeline flanges themselves, but they do not remove those hazards from other equipment, such as valves, that may be located nearby. It is in most instances, therefore, not appropriate to remove a zone based on the installation of a flange guard. As with any change, unintended consequences must be considered; is there potential for other hazards to be introduced by the use of flange guards?

Furthermore, where flange guards are installed, they are vulnerable to accidental removal, failure to be replaced correctly

(or at all) following maintenance and general mismanagement that can impact their integrity. Failure of a guard can re-introduce the potential for a release that could result in flammable mist formation.

The installation of flange guards does however reduce the frequency that a flammable mist could occur and therefore site LEVEL from a hazardous area perspective. They are also an effective measure in demonstrating that risk is being managed to As Low As Reasonable Practicable (ALARP) and show that steps are being taken to reduce risk, as long as they are implemented and managed correctly. Nevertheless, with the lack of standardisation and guidance available, it does not seem appropriate to use them as a zone reduction measure.

Where flange guards are in place, they should be managed as any other safety critical equipment would be managed on high hazard

sites. There should be a robust management system in place for their design, installation, inspection and maintenance. Isolation and permitting procedures should be followed when they are removed, and their maintenance regime must be suited to their criticality.

There has been some attempt to develop guidance on the use of flange guards, however at present there is a lack of international recognition. Evidence points to flange guards becoming more prevalent in the future, and certainly, under the right specification, a useful measure for controlling flammable mists. But before hazardous area zones can be managed and classified differently on the basis of flange guard installation, time should be spent developing a suitable standard and more guidance on their applicability and functionality needs to be available. Until then, using flange guards to remove hazardous zones should be treated with caution and robust systems should be in place to identify where their installation is appropriate.

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