Inherent Safety Index For Transportation Of Chemicals

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ABSTRACT

Inherent Safety can be understood as the absence of hazards (which implies lower risk) rather than low risk, which can be reached by add-on protective barriers. While the methodologies for risk analysis are well developed and understood, the evaluation of inherent safety is not based on systematic procedures and depends on the assessment of subjective principles.

Chemical substances are one of the most important sources of hazard in a chemical process due to its intrinsic chemical and thermodynamic properties. When these substances are raw materials or sub-products (waste) they must be transported to/from the chemical facility, and this activity extends the chemical hazards from the processing plant to the community. Therefore, to obtain a general evaluation of the inherent safety level of a chemical plant, it is necessary to consider the hazards due to transportation of chemicals and treat these as an additional “property” of the substance.

This paper presents an overview of a novel inherent safety index based on fuzzy logic, which is useful to evaluate the inherent safety level of a plant. An example evaluates the transportation step of chemical substances, shows how the index works, and how it can be applied in different stages of the life cycles of a chemical facility.