Development of the Incident Scenario for LOPA

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ABSTRACT

Layer of Protection Analysis (LOPA) is used to evaluate hazards and make decision as to whether or not the layers of protection in place are sufficient to guard the hazard involved. LOPA takes a predefined cause – consequence pair accident scenario and determines how many independent protection layers (IPLs) are required in order to meet risk acceptance criteria. In order to specify an appropriate accident scenario, different process hazard analysis (PHA) methods are used. Those require some additional efforts and in some cases are not mandatory and bring also some uncertainties. In many cases the expert method can be successfully used leading to fast and comparable results. So we look into the expert method which can be included into LOPA to generate automatically the accident scenario. The method proposed takes into account the knowledge on causes of major hazard releases and some basic and preliminary conditions like properties of released chemical substances, types of releases (rupture or leak), and existing enabling events (presence of ignition source and meteorological conditions). Ten different generic accident scenarios have been identified. Subsequently, they are used for selection of particular cause-consequence pairs and IPLs as well as the category of consequences. This method has been enclosed to specialized software that automates the LOPA process.