History of Dutch process equipment failure frequencies and the Purple Book

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ABSTRACT

In the middle of 70s concerns of the public in the Netherlands about fire, explosion and toxic risks due to mishaps in the expanding process industry, causing political pressure led to the embracement of quantitative risk analysis as tool for licensing and land-use planning. Probabilistic treatment of risk had been exercised before to design flood defense. A ‘test’ on six different plants, the COVO study, favored the idea. Failure rate values were in immediate need. For storage vessels AKZO’s chlorine vessel data and British steam boiler data have been the first. Risk criteria to make decisions on were also developed and in 1985 embodied in legislation. As licensing and land-use planning are tasks of provincial authorities, under the auspices of the Inter-Provincial Consultation (IPO), further details such as failure frequency values have been worked out. In the late 90s the Purple Book consolidated the information as a guideline for Dutch quantitative risk assessment of process installations.

The paper will give a condensed historical overview, guidance to published papers; it will further make comments, explain policy backgrounds, present comparison with other data and will briefly indicate in which direction developments should go to improve QRA.

Keywords: Equipment failure rates; Quantitative risk assessment; Process safety; Risk acceptance