Pipeline puncture scenarios near fuel depots – contribution to risk and implications for land use planning

This paper is concerned with accidental pipeline puncture events that lead to spray evaporation of moderately volatile liquids, gasoline in particular. The paper argues that both likelihood estimates and hazard ranges of pipeline puncture scenarios, and hence their contribution to risk, exceed those of tank overfill scenarios. This is particularly true for fuel depots which have implemented improved overfill protection measures in response to revised recommendations because of the 2005 Buncefield incident. The paper briefly examines the regulatory permitting regime for pipeline transport of dangerous substances. Pipelines are not covered by the Seveso III Directive. At the EU level, there are no requirements for systematic risk analysis, land-use planning and information to the public, amongst others. Furthermore, the current practice for carrying out pipeline risk analysis appears to largely overlook evaporation from puncture scenarios. The contribution of pipeline punctures to risk in a land-use planning procedure may therefore go unrecognized. The omission is important if such scenarios can generate very large vapour clouds that contribute significantly to overall risk. Many ports in Europe are losing traditional industrial enterprises. There is often a desire to develop and revitalize vacated lots at ports relatively close to expensive land near urban centres, for instance construction of upscale residential housing or office buildings near waterfronts. Fuel depots stay in the harbour however, to supply fuel to the urban centre. The inclusion of pipeline puncture scenarios may have major implications for risk mitigation measures and/or land-use planning around fuel depots, in particular for depots located in ports.