



a model for estimating road accident probability involving dangerous goods

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Literature about risk analysis relative to industrial systems is wide and it's know like Quantitative Risk Analysis (QRA). This approach is applied in many projects to analyse risk relative to fixed systems (ARIPAR, SIMAGE, Canvey Island, Rijmond, ARTIS, ARIPAL, GRIPAL). In the last years the attention has moved from fixed systems to all production and consumption activities. The evolution of the QRA for transport activity is known like Transportation Risk Analysis (TRA). Literature about TRA is recent and relative models are in evolution. Risk analysis relative to dangerous goods is applied to realize Decision Support System (DSS) to plan and to manage system (FLAG, OPTIPATH, TRAMP e RELAMP). Risk relative to dangerous goods transport is estimated generally in an aggregate way. In other cases systems of models to estimate single components of the risk (probability, vulnerability and exposure) are proposed. In this note, a model for estimating road accident probability involving dangerous good is proposed. The proposed model is based on a nested structure representing a set of three macroevents that characterize the incident: 1) a vehicle is involved in a road accident with or without dangerous goods; 2) a vehicle with dangerous goods or its components is failed; 3) a dangerous good generates a consequence on surrounding environment. In the approach proposed, single event can be represented by different components: - for a road accident, the conditioned probability components are the follows: a)an heavy vehicle is involved; b)a vehicle carrying dangerous goods is involved (alone or with other vehicles); c)a release of dangerous goods is verified. Singles probabilities relative to these components are estimated with descriptive model calibrated based on the official data relative to the years 2000-2004 (ISTAT, 2006); models to estimate these probabilities depends on human factors and environmental characteristics; - for a failure of vehicle, the probability components are the follows: a)an element of container of dangerous good is failed; b)a release of danger-

ous goods is verified. Single probabilities relative to these components are estimated with descriptive models available in literature (CCPS, 1995); models to estimate these probabilities depend on vehicle characteristics; - for an effect generated from a dangerous good (for example dispersion, fire or explosion), the probability is estimated with a model calibrated based on the official data relative to the incidents involving dangerous goods in Italy relative to the years 1995-2005 (APAT, 2006).