The Regulatory Use of System Safety Analysis: A Regulatory Effectiveness Analysis

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Systems safety analysis largely evolved in well defined closed systems such as nuclear power plants, factory operations, integrated transport systems and military operations. In such systems regulation is based on explicit command and control by a management structure. However introduction of System Safety tools into open regulated environments introduces an entirely new set of problems. Society regulates safety problems both “directly” through use of control systems of varying effectiveness and “indirectly” though the deterrent effect of penalties and liability exposure. Such regulation creates open networks with enhanced possibilities for failure, both anticipated and unanticipated. In some cases regulation even reduces safety by diffusing responsibility for the safety of the system. The “TITANIC” defense that designers complied with all government regulations is routinely invoked to divert attention from the engineering design process. Regulatory Effectiveness Analysis and Regulatory Root Cause Analysis are tools that can be used to highlight the specific problems likely to be encountered in introducing System Safety analysis into the regulatory process.