

Nuclear and Industrial Facility Vulnerability

Visual Interactive Site Analysis Code (VISAC)

Problem Statement

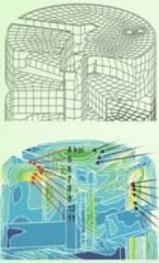
Nuclear, chemical and other industrial facilities are a large and vital part of the U.S. infrastructure. These facilities not only represent a large financial investment but also can pose a serious risk should they become targets for a terrorist attack. Releases following such an incident can adversely affect the public health and contaminate large areas. It has become clear that these high-value, fixed assets rank near the top among possible targets that must be safeguarded from terrorists.

Technical Approach

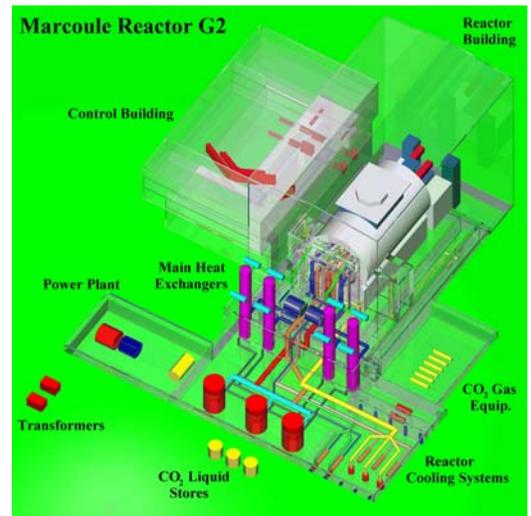
VISAC is a Java-based graphical expert system developed by ORNL in response to the pressing needs of several government agencies. VISAC provides security specialists and mission planners with a fully integrated capability to analyze and predict the outcomes of accidents/incidents at nuclear, chemical and other industrial facilities. Incidents can range from simple sabotage of individual components to complex sorties utilizing a range of military weapons, car bombs, and/or satchel charges. Damage to the facility structures and critical components is calculated by using blast correlation models to estimate equipment failure probabilities, direct structural damage, and the probability of undesirable collateral effects such as fire, chemical, or radiological releases. Using event/fault tree methodology, VISAC provides the probability of facility kill, the probability of undesirable collateral effects (chemical or radiological releases), and an estimate of facility down time. VISAC can provide transport and deposition of releases as well as the population at risk, and display the results on various maps. VISAC is supplied with a library of models that can be customized by the user in both geometry and logic to approximate a number of facilities of interest. VISAC is a very fast tool for calculating individual scenarios and can also be used to generate vulnerability maps showing the areas of a facility that have the greatest need for additional security measures.

Point of Contact:

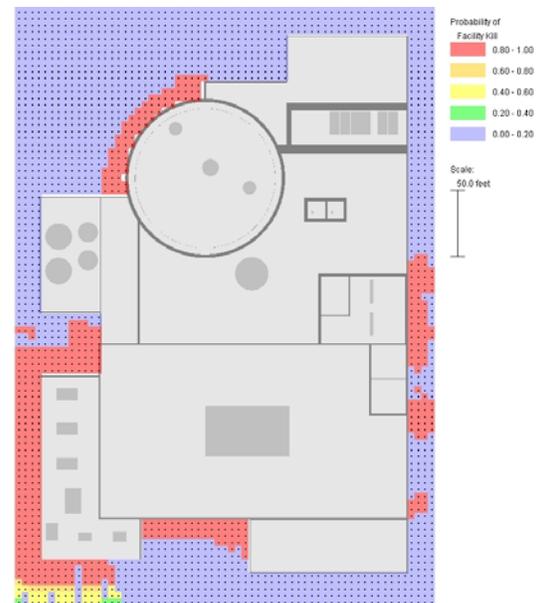
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Modeling and Simulation Group



Example VISAC Facility Model.



Example VISAC Threat Map.