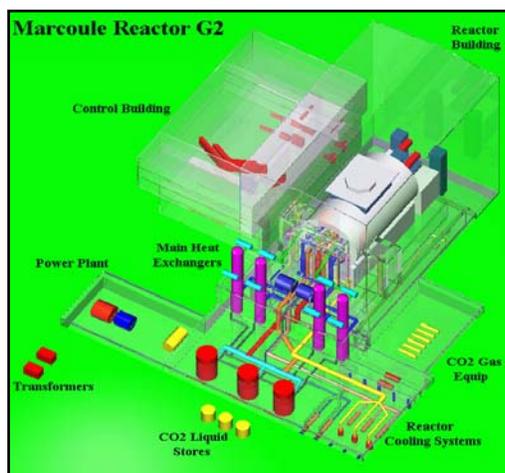
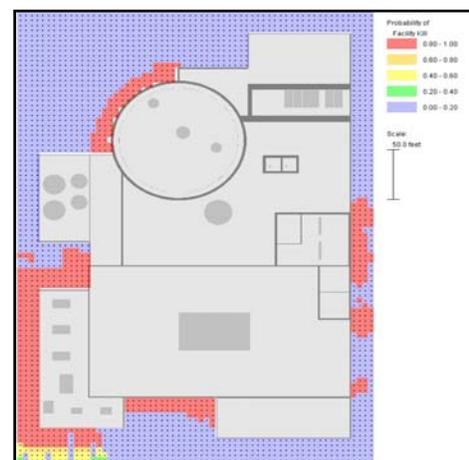


## The ORNL Modeling and Simulation Group's Visual Interactive Site Analysis Code (VISAC) For Industrial/Nuclear Facility Vulnerability Analysis

The ORNL Modeling and Simulation Group (MSG) develops sophisticated numerical solutions for a wide range of scientific, engineering, and operational applications. MSG's core competency is computational physics and engineering, and within this context we have developed the Visual Interactive Site Analysis Code (VISAC) software suite to evaluate vulnerabilities at nuclear, chemical, and biological facilities worldwide. Initially produced for the Defense Threat Reduction Agency (DTRA), VISAC is a Java-based expert system that provides mission planners with a coordinated capability to predict and analyze the outcomes of a wide variety of attacks and/or industrial accidents. Incidents can range from simple sabotage of individual components to complex sorties against multi-building facilities utilizing a range of military weapons, car bombs, and/or satchel charges. The target facility is usually generated by customizing existing 3-D CAD models. Through the use of the event/fault tree methodology in VISAC, damage to critical structures can be used to predict the final state of the primary target facility as well as the status of surrounding facilities. For a given attack scenario and facility configuration, VISAC provides the probability of facility kill, probability of undesirable collateral effects, and an estimate of facility and/or equipment down time. Additionally, VISAC can be closely coupled with the HPAC atmospheric-transport code to provide estimates of regional environmental effects. In addition to DTRA, MSG has applied VISAC to vulnerability studies for the Nuclear Regulatory Commission, Defense Intelligence Agency, Environmental Protection Agency, North Atlantic Treaty Organization, and the Air Force Institute of Technology. VISAC is a mature and extremely versatile software tool. The underlying CAD/event-simulation methodology can be applied with equal effectiveness to essentially any collection of mechanical components including, but not limited to, vehicles, naval vessels, and aircraft. This inherent versatility makes VISAC the ideal facility vulnerability analysis tool for a broad range of R&D, industrial, homeland defense, and military applications. We welcome the opportunity to discuss your potential applications and ways VISAC can contribute to a solution.



*Typical CAD-based graphical representation of a VISAC power reactor facility vulnerability model*



*VISAC vulnerability results showing threat probabilities for a truck bomb attack against typical nuclear power reactor building*