Overview of the MACCS Consequence Analysis Computer Code

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MACCS (MELCOR Accident Consequence Code System) is a consequence analysis computer code to simulate the offsite impacts of an atmospheric release of radioactivity from a potential nuclear power plant accident. MACCS integrates models for atmospheric dispersion, short- and long-term protective actions, dose assessment, deterministic and stochastic health effects, and economic impacts. Decontamination is one of the protective actions that MACCS models, which is an important consideration in calculating long-term doses to the public and economic impacts.

Since the weather during an accident on a future unknown day and time cannot be known, MACCS samples from a full range of weather conditions and gives a distribution of potential consequence results. The offsite consequences computed include doses and health effects, land contamination, displaced individuals, and economic impacts. In addition to decontamination, MACCS models other protective actions as well, including the effect of sheltering, evacuation, relocation, and temporary and permanent land interdiction.

There are no other codes currently in use in the United States that combine the set of capabilities found in MACCS. As such, it has a wide user base including the Nuclear Regulatory Commission (NRC), the nuclear power industry, Department of Energy, Defense Nuclear Facilities Safety Board, and members of the academic community. NRC distributes the MACCS code suite for domestic use and to over 500 international users in 28 countries as part of the Cooperative Severe Accident Research Program, and there are hundreds of users worldwide.