

Course Description Only

A copy of the course handout may be provided upon approval from the trainer.
Please check back later.

MACCS2 for DOE Safety Analysis Applications

Instructor: Kevin O’Kula WSMS

Jackie East WSMS

Date/Time: Sunday, May 20, 2007 8:00 am to 5:00 pm

Class Size: 20

Materials: Attendees must bring a laptop computer

Course Description: The MELCOR Accident Consequence Code System Version 2 (MACCS2) code, and its predecessor, MACCS, are based on the straight-line Gaussian plume model. MACCS was developed originally for the Nuclear Regulatory Commission (NRC), whereas MACCS2 is an enhanced version that was developed with DOE and the entire nuclear fuel cycle applications in mind. Currently, MACCS2 is the most widely used consequence analysis code in the DOE complex for support of safety basis analysis.

The code provides considerable flexibility in preparing input, and the analyst needs to exercise care in preparing input parameter values. These include the following:

- Mesh intervals for the spatial grid,
- Receptor position and population distribution,
- Weather input [constant weather, various variable-weather scenarios (e.g., using one year of hourly averages of wind speed and direction, stability class, precipitation), and type of weather sampling],
- Dispersion parameter set and power law constants, site characteristics
- Release height, number and duration of plumes,
- Radionuclides (i.e., over 800 radionuclides are available in the MACCS2 dose conversion factor database, an increase of over 500 from MACCS),
- Dose conversion factor files,
- Sensible heat
- Radiation shielding parameters, and
- Deposition and resuspension.

While MACCS2 can be a powerful tool for safety analysis and the overall support of a DSA, the new user can face appreciable uncertainty in selecting the right models and in the choice of inputs. Experienced user-led training can reduce learning curve time and facilitate preparation of defensible consequence analyses.

This course will initially provide an overview on performing radiological dispersion & consequence analysis for support of Documented Safety Analyses (DSAs) compliant with the DOE Standard DOE-STD-3009-94, Appendix A, CN3, and related DOE documentation. Secondly, the course will guide attendees on applying the MACCS2 code to perform the DSA support analyses and other safety analysis applications.