RASCAL Change Log: Version v4.0

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This update to the Radiological Assessment System for Consequence AnaLysis (RASCAL) computer code represents a significant update from RASCAL 3.0.5 (NUREG-1887). The technical documentation for these new models and methods used in RASCAL 4.0 can be located in NUREG-1940, "RASCAL 4: Description of Models and Methods."

RASCAL 4.0 consists of several modules. Five of the modules are used in the consequence assessments for nuclear power plants. Four of these modules are invoked when "Source Term to Dose" is selected on the opening screen. The first module calculates the time–dependent atmospheric release source term. The second and third modules perform the atmospheric transport, dispersion, and deposition calculations and the dose calculations. The fourth module is used to create the meteorological data file used by the atmospheric transport, dispersion, and deposition modules. The fifth module is used for intermediate phase dose calculations based on field measurements. A sixth module is used for uranium fuel cycle consequence assessments.

- **Atmospheric Transport and Dispersion Models:**
  - The most significant change to RASCAL 4.0 is an improved and empirically derived; atmospheric transport and dispersion module (refer to NUREG-1940).

- **Reactor Events (Source Term to Dose Model, STDose):**
  - Improvements and enhancements to STDose model for BWRs which includes features that model noble gases in normal coolant and improved pathway schematics.
  - Added the I-131 equivalent source term effluent release mixture input option.

- **Spent Fuel Pool Events (Source Term to Dose Model, STDose):**
  - Improved options for spent fuel pool accident modeling.

- **Other Fixes and Updates:**
  - An updated and enhanced decay scheme that captures dose contributions from all significant radionuclide daughters.
  - Added *Shapefile* export functionality for overlaying plume plots onto GIS maps.
  - Added the option to view total ground deposition concentrations by radionuclide at single locations.
  - Numerous other enhancements (refer to NUREG-1940).