RASCAL Change Log: Version v4.3

Released Date September 30, 2013

- **New Features and Tools (Additional Tools)**
  - Added the new user tool "*Create Inventory Base File,*" which allows users to enter information about how a reactor has been operated to develop a more realistic and accurate reactor core inventory for use in the STDose model calculations.
  - Added the new user tool "*Source Term Merge/Export,*" which allows users to combine source terms for two or more reactors on a single site into a common source term to allow the user to assess the consequences from a multi-reactor event.
  - Added the new user tool "*Configure Met Download,*" which allows users to setup an automated meteorological data acquisition module to gather and retrieve of meteorological data from the National Weather Service.

- **Reactor Events (Source Term to Dose Model, STDose):**
  - Added the Long Term Station Blackout (SOARCA) option for accident progression as described in NUREG-1935, "State-of-the-Art Reactor Consequence Analyses (SOARCA)."
  - Renamed the reactor source term option from the "Time Core Is Uncovered" in RASCAL 4.2 to "The (LOCA) (NUREG-1465)" in RASCAL 4.3. Additionally, the reactor source term option incorporates a change in the containment pressure/hole-size method of estimating release rates.
  - Renamed the reactor source term option from the "Specified Core Damage Endpoint" in RASCAL 4.2 to "Coolant Release Accidents" in RASCAL 4.3. Additionally, this reactor source term option is now associated with a specific accident that result in core damage (LTSBO and LOCA) and contains updated coolant source terms consistent with the GALE codes (NUREG-0016 and NUREG-0017).
  - Added the option for "Use of Custom Reactor Inventory," which allows the user to model realistic source terms based upon fuel management practices of the site using the *Create Inventory Base File* option code to prevent spray release events from occurring before the start of core damage.

- **Spent Fuel Pool Events (Source Term to Dose Model, STDose):**
  - The Spent Fuel Source Term calculations have not changed significantly in RASCAL 4.3; however, the calculation details require a more complete description of the fuel pools contents and the determination of the nuclide inventory at risk.

- **Atmospheric Transport and Dispersion Models:**
  - Added a fourth Cartesian computational grid which increases the RASCAL 4.3 domain from a 50 mile radius to a 100 mile radius with the associated surface roughness data files for all grids.
  - Added the calculation of the child thyroid dose to allow for the administration of potassium iodide (KI).
  - Added the ingestion DCFs from Federal Guidance Reports 11 and 13 to the radionuclide database.

- **Other Fixes and Updates:**
  - Creation of activity balance file which allows the user to track the activity for selected nuclides and nuclide groups from the reactor core and coolant systems through various pathways to the environment.
  - Added an importance model utility, which allows the user to process the total nuclide activity released to the environment in the course of an event by evaluating the relative importance of the nuclides to four dose measures and ranking the nuclides in order of importance.
  - Added the ability to export and import a time dependent source term file describing the release of radionuclides to the atmosphere and surface concentration in the STDose model in either a XML or CSV format.