RASCAL Change Log: Version v4.1
Released Date January 31, 2011

- **Reactor Events (Source Term to Dose Model, STDose):**
  - Modified the I-131 air concentration units to display as µCi/cm³. Also adjusted the range for the footprints to cover a more useful range.
  - Modified the footprint ranges for deposition to cover a more useful range.
  - Removed the option on the time core uncovered source term screen that allowed normal coolant (core not uncovered). Instead, refer the user to the specified core damage endpoint source term method.
  - Added a warning to the user when calm conditions are used in the model calculations. This will appear as a popup notification at the end of calculations and as a note added to the end of the close-in max value table. The warning states: "Wind direction is uncertain in calm conditions and close-in doses should be used with care."
  - Modified the source term export function to provide the option of stripping the '*' off the nuclide names with implicit daughters. This allows for easier import of the file into other programs which do not recognize the '*' to import the file (e.g. TurboFRMAC).
  - Modified the close-in modeling distance to allow it down to 10 m (from the previous lower limit of 100 m). A warning is displayed to the user and added to the case summary when a distance less than 100 m is specified. The warning states: "At these close distances the point source assumptions may not be valid."
  - Added a tool to calculate a correction factor that can be used to estimate the total dose from a direct reading dosimeter (DRD). A correction factor is shown on the dose vs. time plot screen when viewing the gamma exposure rate.
  - Added a release rate calculator to the Effluent Releases–by Mixtures source term screen. This allows the user to calculate a release rate from a concentration and flow rate.
  - Resolved the iodine partitioning in the puff dispersion model. The default partitioning in RASCAL v4.0 was 25 percent I_2 and 30percent particles. This partitioning was inconsistent with the partitioning in the plume model used for close-in calculations. The default partitioning in the puff models is now 30percent I_2 and 25 percent particles.
  - The calm wind model used for close-in calculations in RASCAL 4.1 has been changed to improve the consistency of dispersion estimates. Additionally, if the surface level wind speed is less than 1 mph in the plume model, or less than 0.5 mph in the puff model, the wind speed is not extrapolated to the release height. The wind speed is assumed to be calm. This change eliminates any unintended plume movement for elevated releases when a wind direction is specified with calm winds.
  - Resolved a minor error in the monitored mixture source term calculation.
  - Resolved a calculation error when using units of *activity/h* in the effluent concentrations source term calculation.
  - Resolved a calculation error when using units of *activity/gallon* in the coolant sample source term calculation.

- **Meteorological Data Processor:**
  - Improved the interpolation between observations and forecasts.
  - Resolved the issue where the code mishandled missing stabilities.

- Added a display warning to inform the user if the code is going to interpolate a wind direction difference greater than 90 degrees.
- Added a display warning to inform the user if forecast entries will be deleted because they have been superseded by observations.
- Resolved the issue where the release point temperature value was being lost.
- Resolved the issue that resulted in a *Stack overflow* error.
- Resolved the issue that resulted in a *File not found* error.
- Resolved an issue where the user could not edit the meteorology when trying to load a v4.2 case that used actual meteorology.

- **Calculations Results (Field Measurements to Dose):**
  - Modified the "cloudshine" dose labels on the early phase doses report, so that an air sample, dose is called "cloud immersion;" and a ground sample, dose is called "cloud submersion."
  - Added an optional user input text field on the sample screen to record when the sample was deposited.
  - Resolved the problem that occurred when the user tried to enter 60 nuclides in the sample.

- **Updates to RASCAL Facility Database and Site Data:**
  - Updated the facility database to change the stack height for BWRs for which there is no stack or for which we do not have a stack height. The change applied only to Laguna Verde, Hope Creek 1, and the generic BWRs.

- **RASCAL Software Installation:**
  - Modified the RASCAL installation program to remove the MapWinGIS components. This helps eliminate a problem some users were having getting the MapWinGIS package to operate. The MapWinGIS installer now handles all components for the tool.
  - Modified the RASCAL installation program to handle both new installations and the updating of existing RASCAL 4.0 installations. There is no need to uninstall RASCAL 4.0 and new users do not have to do incremental updates as was required in RASCAL 3.0.