

## SIERRA Changelog

### Overview

This file contains the detailed update history for each executable component of the SIERRA software package: SIERRA.exe, ATD.exe, and ATD\_Interface.exe. Each section outlines the enhancements, fixes, and changes made to the respective executable, with the most recent updates displayed first.

### SIERRA.exe

Version 1.0.3.0 – [Release Date: 2025-03-31]: Bug fixes and functionality changes following NRC review (Sam Edwards, Mike Mazaika)

- Converted the project code from targeting the .NET Framework 4.7.2 to targeting .NET Core 8.
- The .NET Core framework does not support the ability to shut down a thread using the abort function. To fix this, the splash screen was converted to its own executable, which is started as a child process that is killed after a set period of time, closing the splash screen.
- Added new text to the descriptions for the three analysis types

Version 1.0.2.0 - [Release Date: 2024-12-12]: Incremented for consistency and clarity in NRC version.

- No changes made to SIERRA interface/code. Incremented to account for changes made to ATD interface.

Version 1.0.1.0 - [Release Date: 2024-10-09]: Bug fixes following NRC review (Sam Edwards).

- Fixed scaling issue to align with some of the NRC screen resolutions.
- Removed “Not Started” under Module names.
- Modified code to allow for text updates to occur for Control Room, Design Basis, and Routine Analysis resulting from mouse clicks only.
- Fixed the text window for the Design Basis Accident so text isn’t cut off.
- Added the comma to the Control Room Analysis text and updated user guide image.

Version 1.0.0.0 - [Release Date: 2024-09-27]: Initial Release

- Initial implementation of core functionalities.

### ATD.exe

Version 1.0.2.0 - [Release Date: 2025-03-31]: Bug fixes and functionality changes following NRC review (Sam Edwards, Mike Mazaika)

- Added buoyant plume rise for Design Basis Accidents Analysis and Routine Analysis
- Incorporate DESERT\_SIGMA diffusion option for Design Basis Accidents Analysis and Routine Analysis
- Added open terrain recirculation correction to Design Basis Accidents
- Removed the plume rise function from Control Room DBA
- Modified code to skip processing terrain and discrete receptors if input is not provided by user
- Fixed the language in some of the error and warning messages while reading in json input data

Version 1.0.1.0 - [Release Date: 2024-10-09]: Bug fixes following NRC review (Sam Edwards).

- NRC email address in ATD output files updated to [RAMP.Resource@nrc.gov](mailto:RAMP.Resource@nrc.gov).
- Updated test case output files with new email address and compilation date.

Version 1.0.0.0 - [Release Date: 2024-09-27]: Initial Release

- Initial implementation of core functionalities.

### ATD\_Interface.exe

Version 1.0.3.0 – [Release Date: 2025-03-31]: Bug fixes and functionality changes following NRC review (Sam Edwards, Mike Mazaika)

- Set the default calm wind speed to 0.5 m/s for all analysis types
- Fixed the introductory text for the meteorology panel for all analysis types
- Fixed the calms percentage displayed, legend color order, and legend labels for the meteorology panel for all analysis types
- Increased the maximum elevation to 4000 m for all analysis types
- Fixed the plume rise button in the Module Defaults window for Design Basis Accidents Analysis and Routine Analysis
- Fixed overlapping text in the Module Defaults window for Control Room Analysis and Design Basis Accidents Analysis
- Added “Vent Heat Emission Rate” input variable to incorporate buoyant plume rise for Design Basis Accidents Analysis and Routine Analysis
- Fixed output display to present user-defined percentile for Control Room Analysis
- Limited the diffusion options to NRC only for Control Room Analysis
- Limited the diffusion options to NRC and DESERT\_SIGMA for Design Basis Accident Analysis
- Added “Open Terrain Recirculation” option in the Module Defaults window for Design Basis Accident Analysis
- Changed the polar plot in the terrain panel of the Design Basis Accidents analysis type so that entries in the table update the polar plot immediately
- Limited the discrete receptor distances to positive numerical values for Routine Analysis
- Fixed the error message text for when the terrain is not defined and when discrete receptors are not defined for Routine Analysis
- Changed the polar plot so the range is dynamically updated and added the circle on the figure for the final distance. This applies to the Routine Analysis receptor panel.
- Re-arranged the terrain table sectors for Design Basis Accident and Routine Analysis terrain panels
- Fixed the Receptors tab of the Routine Analysis module to properly account for empty data and to warn the user when receptor is added with missing data.

Version 1.0.2.0 - [Release Date: 2024-12-12]: Bug fixes following NRC review (Elena Yegorova).

- Fixed drop-down window sizing for Control Room Analysis and DBA.
- Fixed repeated drop-down menu items in Release Type drop down.
- Changed “Receptors” to “Receptor” on Control Room Analysis.
- Fixed repeated drop-down options for Receptor Type and Receptor Sector.
- Fixed icon color selection to be a bit more intuitive and remove the blue highlighting of the cell once a color is selected.
- Eliminated the unhandled error screen with clicking on column headings for the new receptor table.
- Fixed the error message to allow users to both save and load a partially defined input file.
- Fixed repeated drop-down menu for terrain range.
- Fixed the global error message to the user to indicate that an entered parameter is out of range.

Version 1.0.1.0 - [Release Date: 2024-10-09]: Bug fixes following NRC review (Sam Edwards).

- Added a main menu button to navigate back to the main menu next to the “Run Analysis” button.
- Fixed auto-sizing/placement of the buttons on the output screens so they aren’t cut off after running (Control Room and Design Basis).
- Fixed auto-sizing of the (Design Basis and Routine Analysis) Terrain Table so the column headers aren’t cut off.
- Fixed Exponents – added in a ^ for squared and cubed notations.

- Eliminated the unhandled exceptions when clicking on the blank space below/around case names.

Version 1.0.0.0 - [Release Date: 2024-09-27]: Initial Release

- Initial implementation of core functionalities.

#### **Version Numbering Convention (X.Y.Z.W)**

- Major (X)
  - There are only 2 values (0 and 1).
  - Anything less than 0 isn't tracked until we get to beta testing.
  - 1 is permanent until they do a whole code rewrite.
- Minor (Y)
  - Each increment indicates new features.
- Patch (Z)
  - Strictly bugfixes. No new features introduced.
- Build (W): Compiled changes, hotfixes, minor updates.