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## HISTORY of WinMACCS

K.L. McFadden, Roger A. Mitchell  
Sandia National Laboratories<sup>1</sup>

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Bug fixes and minor user interface improvements may not be listed below, including modification to variable bounds and changes in the presentation of the model variables on forms.

The release history of WinMACCS is as follows:

WinMACCS 3.4.0 was initially released in March 2008.

- LHS sampling for Atmos, Early, Chronc, and Comida2 models were made available.
- Custom summary reporting was implemented, including combining means and CCDF's over multiple realizations.
- Graphical results were available.

WinMACCS 3.5.0 was a limited (non-public) release in September 2009.

- A feature allowing WinMACCS to run in batch mode was added.
- Uncertainty in Dose Conversion factors was added.

WinMACCS 3.6.0 was released in May 2012.

- Support for user settings were added in a new file, WinMACCS.ini, in the installation folder.
- Modifications were made to support running WinMACCS on Windows Vista.

WinMACCS 3.7.0 was released in February 2013.

- The MACCS2 SUMPOP option was integrated into WinMACCS. This allows the user to define the population fraction of each cohort by grid element.

WinMACCS 3.9.0 was released in July 2014.

- The name MACCS2 was changed to MACCS.
- Resizing capability was added to most forms.
- The ability to change the units of measurement was integrated.
- The usability of the forms that have maps in the background was improved.
- Copy and paste functionality within the data entry grids was improved.
- The cohort paradigm was modified. In WinMACCS 3.7 and earlier, the MACCS2 paradigm of change cards for cohort parameters was used in

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WinMACCS. Parameters for cohort one were required, but the corresponding values used by subsequent cohorts were optional. The value used for the previous cohort would be the value used by MACCS. Now all cohort forms are required allowing the user to clearly identify the value used in the calculation.

- The custom reporting features were expanded to allow values to be reported by model simulation, i.e., a result for each simulation. The previous reporting features only allowed statistically combining values over all simulations.
- The MACCS keyhole evacuation model (limiting evacuation zones to a keyhole shaped area that is expanded as the wind direction changes) was integrated into WinMACCS.
- The MACCS population movement calculation (tracking population movement as a function of time) was integrated into WinMACCS.

WinMACCS 3.10.0 was released in March 2015

- Implemented a multi-source model. This requires selecting the multi-source model in the Properties form and selecting the multi-source term files created using MelMACCS. A new software program, CombineSource, was integrated into WinMACCS to perform the required functionality. New input forms were created to support time offset information for each file.
- Bounds were increased for variables OALARM (2592000 s), PDELAY (2592000 s), ENDEMP (3456000 s), TIMHOT (3456000 s), TIMNRM (3456000 s), DLTSHL (3456000 s), DLTEVA (3456000 s).
- Optional variables were added. EARLY variable DPPEMP specifies the dose projection period for the emergency phase. CHRONC variable DPP\_INTERPHAS specifies the dose projection period for the intermediate phase. EARLY variable TIMRTN specifies the evacuee return time for people in the evacuation zone not directly affected by any plume segment in the early phase.
- Added a new output type, Type 14, requesting output that itemizes the number of people that evacuate and relocate during each phase.
- Implemented ability to copy report definitions from a different project to the current project. A new menu item was added, namely File/Import Custom Report Definitions.
- Database tables containing simulation results read from the MACCS binary files were removed from the project database and moved to external files. This allows larger problems to be run and improves post-processing performance.

WinMACCS 3.11.2 was released February 2018

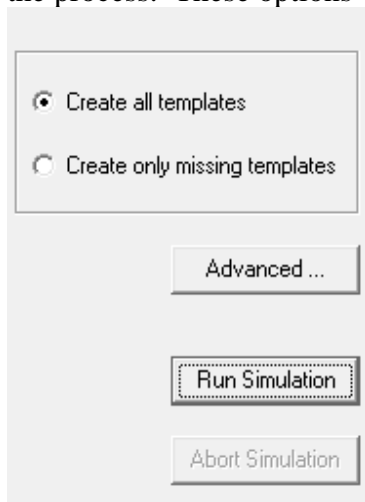
- A new custom report format was implemented. The qualifier values are listed in a tab separated format. The report format is controlled by the user by modifying the property REPORT\_TAB\_SEPARATED\_QUAL in the WinMACCS.ini file. By default, the new format is turned on.
- A file repository folder was implemented. This means that one copy of the DCF and COMIDA2 files can be shared between projects.
- Variable OALARM, notification delay, is now defined for each cohort rather than for all cohorts.

- The organ list in WinMACCS was expanded. It includes all organs listed in the DCF file. Also, COMIDA2 was modified to support these changes. COMIDA2 binary files need to be created with the new version, 2.0.0.0.
- Upper bounds of decontamination cost variables, CDNFRM and CDFRM, were changed from 1E5 to 1E6.
- A check box labeled “Linear Quadratic Dose Response” was added to the Dose tab of the Project Properties form. If this is not checked, then the quadratic coefficients, ACTHRE, DOSEFA and DOSEFB, are not required input.
- A Parallel Simulations option is now supported through Execute menu. This feature takes advantage of the local system’s processors to run multiple simulations concurrently.
- The WinMACCS.ini file has a new property called SAVE\_VECTOR\_RESULTS, which helps prevent a database from exceeding the 2GB size limit for Access databases. By setting this value to false, vector data are not saved to the database. The property is set to false by default.
- A new form was added called “Release Fraction Scale Factors.” This form is tied to a new variable, NUCSCA, which allows for a vector of multipliers to scale release fractions at the isotopic level.
- Upper bounds of number of early fatality and different types of latent cancer effects, NUMEFA and NUMACA, were changed from 5 to 10 and 10 to 30, respectively.
- The ATMOS variable NUCOUT has changed from a scalar to a vector. This allows for reporting on more than one radionuclide.
- Upper bounds for the dose projection period variable, DPPEMP, is now set to ENDEMP.
- Upper bounds for the duration of the intermediate-phase period, DUR\_INTPHAS, and time required for completion of each level of decontamination, TIMDEC, have been updated to 30 years.

#### WinMACCS 4.0.0 was released June 2020

- Functionality was added to the Find Parameters form to export variable values. This form was renamed Find or Export Parameters. Importing variable values exported from WinMACCS is supported in a new menu option, File/Import Parameters from Special Export.
- The bounds of the Comida2 variable, LASTACUM, were changed from [1,50] to [2,50]. A new version of Comida2, 2.0.0.1, was created to support values of LASTACUM greater than 9.
- Unused correlations and ranks are now supported. It is no longer necessary to delete these entries if the previously correlated values were changed to constant before running.
- The HYSPLIT atmospheric transport and dispersion model is supported.
- The RDEIM economic model is supported.
- Support for animation using a new Sandia software product, AniMACCS, is integrated.

- The form used to select cyclical files and multi-source files was improved, allowing network access to cyclical files and an improved interface for modifying the order that the cyclical files are used in the simulation.
- In previous versions, when running MACCS using the cyclical file feature, when a cyclical file fails validation, the process of creating the template files stops. The algorithm was changed to continue to validate the cyclical files and create templates on valid files even when one or more cyclical files fail validation. This feature allows the user to fix all the cyclical files in error before having to restart the process. These options were added to the Run Models form as shown below.



The screenshot shows a portion of a software interface. At the top, there is a group box containing two radio button options: "Create all templates" (which is selected) and "Create only missing templates". Below this group box are three buttons: "Advanced ..." (disabled), "Run Simulation" (active), and "Abort Simulation" (disabled).

- When running in cyclical mode, a file, cyclicalMap.log, is created to list the cyclical file name alongside the simulation number associated with that file.
- A file, run.log, is placed in the project folder. This is created when simulations are run to allow the progress to be monitored.
- The user can select the number of processors to use when the Parallel Simulations option is checked. Also, the next simulation is started as soon as a processor finishes a MACCS simulation rather than waiting for all the processes to finish.
- An option to choose a source term file set per realization was added when running the Multi Source model.
- A node locking feature, restricting the usage of MACCS to a specific computer (e.g., node) was implemented. Before running MACCS, it is necessary to request a node unlocking key from Sandia. The key is valid for 365 days.
- The number of output requests permitted is only bounded by the resources available on the computer running MACCS. In WinMACCS, a limit of 999 is set for each output request. Specifically, the upper bound of the following variables was changed to 999: NUM0, NUM0\_MS, NUM0\_HY, NUM1, NUM2, NUM3, NUM4, NUM5, NUM6, NUM7, NUM8, NUMA, NUMB, NUMC, NUMD, NUME, NXUM9, NXUM10, NUM12, NUM13, NUM14.

WinMACCS 4.1.0 was released July 2021

- A MACCS Documentation menu item was added to the Help menu that displays a list of the documents shipped with WinMACCS and located in the MACCS Documents folder. When one of the documents is selected from the list by the user the document is opened in its default program.
- A dialog box with a progress bar was added to be displayed when a project is upgrading to a newer version.
- The Wind Rose tab on the Properties form was set to be disabled when the HPSPLIT option was selected.
- A bug that incorrectly showed a value of 0, 0 on CCDF plots was fixed.
- The descriptions for the HY\_START and HY\_END variables were changed to: “The first date for weather sampling in MM/DD/YYYY format.” and “The last date for weather sampling in MM/DD/YYYY format.”
- A bug in the Cyclical File Set form that caused the moving of the order of files in the list to be incorrect was fixed.
- The units for the variables: ECON\_DEF\_DRT and ECON\_DEF were changed to the correct units of 1/yr.
- To support Nearfield calculations a RAF option for the variable MNDMOD on the Properties tab was added.
- To support Nearfield calculations a new variable: SRCMOD was added to the Properties form Plume tab with the possible values of PNT (Point Source) and AREA (Area Source).
- To support Nearfield calculations on the Plume tab of the Properties form a Plume Trapping/Downwash area was added with the Automatic Trapped Plume Release Height Calculation checkbox.
- To support Nearfield calculations a new form: Additional Building Data was added with the BUILDW, BUILDL, and BUILDA variables.
- To support Nearfield calculations a PHTRP variable was added to a new form: Trapped/Down washed Plume Release Height.
- A new form: US NRC Regulatory Guide 1.145 Point Source Meander with variables: PSMEQ1C and PSMEQ2C was added to Plume Specifications under ATMOS.
- A new form: Ramsdell and Fosmire Meander was added to Plume Specifications under ATMOS with the following variables: RAFDIST, TIMSCLY1, TIMSCLZ1, TIMSCLY2, TIMSCLZ2, BKGTRBV, BKGTRBW, TRBINCW1, TRBINCW2, TRBINCW1, TRBINCW2.
- The Projective Peak Dose Polar form was created under Output Control under the EARLY section with the NAME, DURATION, and Report Options variables.
- Multi Source and Choose Files for each Simulation were moved to the Scope tab on the Properties form.
- The Plume/Source tab was renamed: Plume
- On the Properties form Transport tab the Plume Meander inputs were set to be disabled when the HPSPLIT option was selected.