Summary of eQUEST Changes & Fixes

18 March 2014

This summary includes information about updates to the eQUEST wizards, user interface and reporting mechanisms. Refer to DOE-2.2's bug fixes PDF and/or Volume 6 (New Features) of the online DOE-2 help file for the latest information about changes to the DOE-2 simulation engine. All changes/fixes are listed in reverse-chronological order of implementation (from most recent to earlier additions/fixes).

eQUEST v3.65

build 7163 – public release ~ 18 March 2014 – w/ DOE-2.2 v48r

Fixes:

- Fixed issues with the simulation detailed results viewer application (D2SimViewer.exe) that prevented the viewing of hourly results in some instances (all appeared as zero values) when the correct results were located on the simulation output file (the .sim file).
- Fixed issues with the installation procedure sometimes failing in cases where the installation is directed to a drive mounted from a network location.

build 7158 – public release ~ 4 Nov 2013 – w/ DOE-2.2 v48m

Fixes:

- Fixed issue opening DWG files and updated that capability to allow processing of files through version 2014.
- Removed "self repair" feature of install package that was preventing user files from being moved after the install. The user directories are placed into the the users "My Documents" directory during the installation process and these directories are "pointed to" by paths placed into the eQUEST.ini file in the eQUEST installation directory (placed into "Program files" system directory – (x86) appended for 64-bit systems). Changing the user files location and the ini file paths requires administrator capabilities and should be done carefully. Placing user files on network drive may not work (depending on the network drive implementation) and can also slow application execution as the user directories are used for all intermediate results file storage.

build 7155 – public release ~8 Oct 2013 – w/ DOE-2.2 v48m

Fixes:

- Fixed issue with definition of layered constructions that allowed use of "R-value only" material which causes BDL errors upon wizard exit into detail display.
- Removed access to wizard features not implemented in the current DOE-2.2 version that caused spaces to be created without corresponding zones thus BDL errors upon wizard exit into detail display.

build 7155 – public release ~8 Oct 2013 – w/ DOE-2.2 v48m

Additions / Enhancements:

- The eQUEST application was ported to a more current compiler (Visual Studio 2010) from a very old development environment (Visual C++ 6.0). This conversion is expected to fix many issues that occur when running eQUEST 3.64 under Windows 7 and Windows 8, such as the "Parameter incorrect" and "Parameter Not Found" pop-up error messages. Third-party

software components in eQUEST such as spreadsheet tools, display tools, etc. were also updated to current versions; we expect this will eliminate many additional incompatibilities with Windows versions that have been experienced by users in recent years.

- Support was added in commands that use the TYPE keyword and have alternate keyword lists for each TYPE to support alternate expressions for each of the different keyword lists. Previously only one expression was allowed for each position in the command keyword list. This is mostly a DOE-2 enhancement but important to users who take advantage of expressions in commands using TYPE.
- The eQUEST refrigeration version is now included in the general eQUEST installer. Refrigeration models must be created in the detailed interface as there is not support for refrigeration equipment in the wizards.
- The maximum memory allocation for DOE2.2 has been increased from 20 Megabytes each for interactive BDL processing and simulation execution to 300 megabytes and 480 megabytes respectively. The consequence of this change is that much more complex models can be created and run. However, this additional memory allocation may cause problems on machines with limited total memory (such as 4GB). As part of this change the maximum number of many building components has been increased.
- The maximum number of hourly reports has been increased from 16 to 30. The number of variables per hourly report has been increased from 60 to 256.
- The maximum number of zones per shell was increased from 200 zones per shell to 400 zones per shell. This allows more complex buildings to be modeled. Previously when the zone limit was exceeded eQUEST simply failed to add new zones, with no error message. Now users exceeding the 400 zone limit are alerted and breaking model up into several smaller shells is suggested. Also number of custom zones was increased from 200 to 400. Maximum number of line segments per floor/zone polygon was increased from 900 to 1800.

Fixes:

- Fixed bug with reading DOE-2 Report from the Windows program version 6 (or later) where previously some film properties were not properly loaded into the project.
- Previously some eQUEST projects would hang, presenting the user with an hourglass after detailed interface modification and never returning a prompt (or sometimes causing stack overflow crash with some input files).
- Previously changing HVAC system type in a very large model could cause eQUEST to “hang” (not return from the hourglass state.
- Previously a BDLMods exceeded message would be issued followed an eQUEST”hang”.

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eQUEST v3.63b, build 6510 – public release ~7/01/09 – w/ DOE-2.2 v47d

Fixes:

- Bug in the logic that controls THERMOSTAT-TYPE as a function of MIN-FLOW-RATIO – VAV systems set THERMOSTAT-TYPE = REVERSE-ACTION (i.e., VAV flow in heating and cooling) if the MIN-FLOW-RATIO < 0.40, else THERMOSTAT-TYPE = PROPORTIONAL (VAV cooling, constant volume heating) when the MIN-FLOW-RATIO ≥ 0.4 The bug results from the fact that the expression looks first at the SYSTEM MIN-FLOW-RATIO, when it should look first at ZONE MIN-FLOW-RATIO (6/09)
- Bug associated with OA when using both SUPPLY-FLOW (system level) and ASSIGNED-FLOW (zone level) – An error occurred when users input SUPPLY-FLOW at the SYSTEM level and input ASSIGNED-FLOW for one or more ZONEs. This led to the outside air requirement for the affected zones being ignored in the summation of zone outside air requirements. This led to an incorrect amount of OA being modeled and reported on SV-A. (6/09)

- Bug associated with heating minimum flow ratio (HMIN-FLOW-RATIO) effecting VAVS, DDS, and MZS systems – soon after the last release (v3.63), users and development team members identified a problem that was evident only when user input was provided for MIN-FLOW-RATIO at both the SYSTEM and ZONE level. (6/09)

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eQUEST v3.63, build 6500 – public release ~5/12/09 – w/ DOE-2.2 v47b

Additions / Enhancements:

- Project open/load procedure – prevent opening and loading of referenced DWG files when in the middle of performing parametric runs (as is already the case for EEM runs). This change should noticeably decrease parametric run simulation time and memory use for projects with both parametric runs and one or more fairly large/complex DWG files. (5/09)
- Wizard central plant – added total loop head and delta-T properties, defaults and range checks for chilled, hot and condenser water loops (incl. WSHP & GSHP condenser water loops) to better facilitate comparisons of models with differences in central plant configuration. (4/09)
- Whole building EEM wizard – added icon w/ tooltip and message box as an indication that the user is defining an EEM run and not the baseline model description. (4/09)
- Detailed UI – added access to Ice Rink modeling keywords (of the ZONE command) to the main view spreadsheet and parametric run dialog. (4/09)
- Documentation - updated Introductory Tutorial (including a new 'Quick Start' section). (4/09)
- Wizard/simulation equipment libraries – added program initialization code to automatically scan and load any Wizard/Simulation libraries contained in the <eQ Data>\Libraries\ directory (such as those distributed in the ClimateMaster add-on). This means that modifications to INI files are no longer required when installing Wizard/Simulation component libraries. (4/09)
- Wizard ground loop heat exchanger default – revised default GHX depth (from 200 to 10) (and corresponding help documentation) to help ensure users are aware that specifying GHX sizes is a user requirement and not something DOE-2 can handle. (3/09)
- Detailed UI – added access in tabbed dialogs & building spreadsheet to new BDL SPACE keywords for ASHRAE enhanced method infiltration method modeling and expansion of lighting keywords enabling specification of LIGHT-TO-SPACE, LIGHT-TO-OTHER, LIGHT-TO-RETURN, LIGHT-RAD-FRAC, OTHER-RAD-FRAC and LIGHT-HEAT-TO for each of the five individual lighting power/system inputs (as opposed to previous versions where only 1 overall value for each of these keywords could be entered for application across all lighting powers/systems). (3/09)
- Directory display – added menu bar options: Tools – View File Locations to open a Windows Explorer window for (1) the current project, (2) general (topmost) projects and (3) eQ data directories to assist users in locating their project and other data files, such as weather, rates, libraries, etc. (3/09)
- Quality control (QC) reporting – numerous additions and fixes to QC reporting mechanism available via the Tools menu. This feature is now robust enough for fairly experienced users to utilize but probably not comprehensive enough to provide more direct user access to (via prompt following each simulation, toolbar button, etc.). (3/09)
- Pitched roof shape – completed new feature where user can outline a custom shape using the same basic resizable dialog as that used to define custom footprint and zoning to define the outline of a pitched roof. This feature is designed primarily to enable the user to simplify roof outlines that the wizard defaulting mechanism is not able to properly translate into contiguous 3-D roof surfaces. (2/09)
- Hourly report definition – updated/fixed several hourly report labels and expanded width of dialog to ensure hourly series labels can be viewed in the entirety. (2/09)
- Documentation - updated Detailed Simulation Reports Summary tutorial. (2/09)

- Detailed UI dialog additions – added access to missing EVAP-COOL SYSTEM keywords and also removed EVAP-CL+M-SUP keyword for the EVAP-COOL system type (as this system cannot have mechanical cooling). (2/09)
- Wizard indoor design temperatures for Unconditioned and Plenum zones – modified the values used to write DESIGN-HEAT-T and DESIGN-COOL-T for Unconditioned and Plenum zones. This change will increase the heat transfer across internal surfaces (e.g., ceilings) assumed by the design sizing routines and should result in fewer occurrences of hours outside throttling range from runs whose flow HVAC system rates were autosized by eQUEST. (2/09)
- Detailed UI building spreadsheet – changes to facilitate the display/edit of multiple keyword list TYPE (negative-TYPE) commands by ensuring that only components of the same TYPE as the active component be displayed at a given time. Principle affected commands are DAY-SCHEDULE, WEEK-SCHEDULE, CHILLER, CURVE-FIT, THERMAL-STORAGE, ELEC-METER and GROUND-LOOP-HX. (12/08)
- Parametric run reports – renamed to better indicate individual and total page numbers. (12/08)
- Detailed UI project tree – revised refresh mechanism to retain current state of branches opened/closed following creation & deletion of components and ensure that horizontal scroll bar (if any is present) is set to leftmost position following each reset. (12/08)
- 3-D building view – shading of walls & windows by construction and glass type assignments has been enhanced to utilize a greater number of colors (by default) and to refresh properly following construction/glass type creation, deletion and renaming. (12/08)
- Detailed UI building spreadsheet – additions to facilitate the display/edit of newly added keywords of the WINDOW and SPACE commands. (9/08)
- Parametric & EEM run results storage – added two new results to the end of each <project name> - Parms.csv results file: BEPS % outside throttling range and % plant loads not met results. (9/08)
- Documentation - updated Life-Cycle Costs tutorial. (9/08)
- DWG file format compatibility – upgraded DWG compatibility to support versions through the 2009 format. (8/08)
- Installation mechanism – Upgraded the eQUEST installation mechanism to a new system that is more compatible with the latest Windows XP & Vista directory/file writing privilege restrictions. (8/08)
- Demand controlled ventilation – added new controls to the wizard to facilitate modeling of DCV for wizard projects (accessible via the “Fan Flow & OSA” button on the “HVAC System Fans” wizard screen). (8/08)
- Condensing boilers – added wizard access to newly implemented DOE-2 modeling of condensing boilers. (7/08)
- Detailed UI building spreadsheet – additions to enable access to ELEC-GENERATOR, UTILITY-RATE, BLOCK-CHARGE & RATCHET components within the building spreadsheet and parametric run interface. (4/08)

Fixes:

- Error leaving wizard or opening project – there were problems reported by a small number of WinXP & Vista (mainly 64-bit) users of v3.63 pre-release builds where the program occasionally would not successfully leave the wizard (via the Finish button) and/or open a project during program initialization. This was found to be caused by a stack overflow that was fixed in the final wrap of v3.63. (5/09)
- Electric/gas rate BDL include filename length – projects whose wizard data references electric and/or gas BDL include (*.ert/*.grt) files to model rates previously ran into problems for projects with particularly long project (.pd2) filenames. The fix here was to modify the BDL include file referencing mechanism to utilize shorter electric/gas rate filenames as the basis of

the included filename and also to prevent the use of any filenames that exceeded the length that BDL is compatible with (<= 57 characters, excluding .3 extension). (4/09)

- Detailed UI DOE-2 required keyword collection – added entries to BDLUIData.csv to include labels and messages for many more DOE-2 keywords that can be required in some cases for commands POLYGON, LIGHTING-SYSTEM, LUMINAIRE-TYPE & LAMP-TYPE. (4/09)
- Detailed UI DOE-2 required keyword collection – modified order in which certain required keywords are collected when modifying the TYPE of any BDL command (previously making it impossible to change CONSTRUCTION TYPE from LAYERS to U-VALUE). (4/09)
- Spreadsheet height – fixed mechanism designed to always display an integral number of spreadsheet rows to take into account spreadsheet frame width. (4/09)
- Spreadsheet tooltips – tooltips are the small messages that pop-up when hovering the mouse cursor over user interface controls. Previously, hovering the mouse over spreadsheet/grid cells presented tooltips containing only the value displayed in the cell. This fix now enables the display of wizard property and DOE-2 keyword help messages. (4/09)
- Daylight control positioning – improved T-24 2008 methodology to center control in front of window when only secondary, sidelit daylight area identified in space (affecting wizard & detailed UI defaults and Savings By Design (T-24 compliance) analysis). (4/09)
- EEM runs – fixed critical bug where "whole building" EEM runs based on runs other than the immediately preceding runs were causing baseline building models to get overwritten by one of the preceding EEM runs. (4/09)
- DOE-2 (BDL) input file writing – modified BDL writing mechanism to always write out building model components pulled in from BDL or eQUEST libraries and not modified by the user (helps to fix order of input & LIKE problems when reading BDL file back in). (4/09)
- Creating new components “linked” to an existing component – fixed problem where new components (linked to existing components) that have expressionized keywords were not displaying results of the current expression evaluations until further modifications were made to the components. (4/09)
- Water-side HVAC project tree – fixed problem where new child components of CHILLERS (and some other plant equipment) were not showing up under the chiller in the tree control until after navigation away from and back to the water-side HVAC module. (4/09)
- DOE-2 (BDL) component creation - creation of certain assigned/child components now required whenever creating components that are copied from or linked to existing components that have such assignments (mainly PUMPS & HEAT-EXCHANGERS). (4/09)
- SD wizard HVAC temperature schedules – fixed bug where temperature schedules for system #2 temperature schedules were not properly written to DOE-2 model (COOL-TEMP-SCH & HEAT-TEMP-SCH). (4/09)
- SD wizard HVAC screen - System #2 fan schedules updated to include access to the revised night cycling controls, (3/09)
- Wizard HVAC fan defaults – revised fan on operation access and defaults (i.e. INDOOR-FAN-MODE = INTERMITTENT) for systems that are not compatible with this option in DOE-2, including HP, PMZS, PTAC, PVAV, RESVVT & UVT. (3/09)
- Title-24 compliance analysis ruleset – update w/ several bug fixes based on issues presented by users. Unsure as yet whether or not we will seek CEC certification of T24-2005 compliance analysis for this version, leaving v3.6 as the only T24-2005 certified release. Work is underway on the T24-2008 compliance ruleset scheduled to be submitted to CEC for certification prior to the adoption date of August 1, 2009. (2/09)
- Wizard model ceiling construction – update to write most ceiling constructions as Layers (rather than U-value) type which serves to eliminate many BDL warnings posted for many spaces during File-Open processing. (2/09)

- Wizard daylight control positioning – fixed bug in algorithm which resulted in improper control positions for many custom footprint/zoning scenarios where space boundaries were not parallel to X/Y axes and also small memory leak within mechanism that calculates daylight control positions which could cause the program to bomb. (2/09)
- Title-24 compliance analysis – fixed bug where ruleset was requiring “skylight roofs” to be specified using Joint Appendix IV construction properties. Skylight roofs are used in eQUEST where skylights are needed in a space below a ceiling plenum. They are created with a construction with no heat transfer capabilities and therefore should be ignored in the compliance analysis. (2/09)
- Detailed UI DOE-2 required keyword collection – added entries to BDLUIData.csv to include labels and messages for DOE-2 keywords that can be required in some cases for the DAY-SCHEDULE and WEEK-SCHEDULE commands. (12/08)
- Parametric run dialog – default the ‘Sort Component Type’ field to be checked and to retain the last state when navigating away from and then back to this dialog and added display of ‘based on’ run value as default where new parametric run values are to be entered by the user (in the grid @ bottom right). (12/08)
- Simulation output viewer – fix to D2SimViewer application to prevent the reading/opening of a .SIM DOE-2 output file from aborting in the event that the reading mechanism encounters a NULL character. (12/08)
- Parametric runs – fixed critical bug where baseline models can get overwritten with the contents of your first parametric run referenced input file when navigating back to the parametric run dialog in cases where the first parametric run is one that references a separate DOE-2/BDL input (.inp) file. (11/08)
- Title-24 compliance analysis – fixed bug during “permit submittal” analysis where eQUEST was checking for SUPPLY-FLOW at the SYSTEM level for zonal systems such as HP and FC. (11/08)
- Title-24 compliance analysis – fixed bug during “permit submittal” where eQUEST did not recognize non-negative inputs for BOILER:CAPACITY as valid inputs. (11/08)
- Title-24 compliance analysis – fixed bug where budget building hot water pump was being assigned an incorrect text string, causing a BDL error during compliance analysis. (11/08)
- Title-24 compliance analysis – fixed bug that allowed the budget conversion rulelist to try and create more skylights than roof area when skylights are required by Title 24 Section 143 C. This has been corrected so that skylight area cannot exceed roof area times 0.999. (11/08)
- Title-24 compliance analysis – fixed processing bug where, during “permit submittal” analysis and user has chosen to save the project as a new project, the ruleset had written incomplete CURVE-FIT command(s) for DW-HEATER(s) causing a BDL error on file reopen. Rules that affect DW-HEATER performance curve assignments were moved to occur after any “save as” action by the user. (11/08)
- Title-24 compliance analysis – fixed bug where hourly reports were being removed in the wrong order (HOURLY-REPORT second, REPORT-BLOCK first) causing BDL error. Revised to reverse component deletion order. (11/08)
- Title-24 compliance analysis – fixed bug where ELEC-GENERATOR, EQUIP-CTRL and LOAD-MANAGEMENT were being removed in the wrong order causing referenced components to be deleted prior to the component(s) they were referenced by. Deletion order was revised to delete referencing components before referenced components. (11/08)
- Title-24 compliance analysis – fixed bug for created hot water loops (created for high-rise buildings when no heating is installed in the proposed building) where the ruleset was searching for user input hot water process loads, but none are stored since no hot water loop exists. (11/08)

- Detailed UI module navigation bar – fixed long-standing bug where returning to eQUEST after having run for some time the navigation bar (bar w/ graphical module navigation buttons) shortens such that the name of each program module cannot be seen. (9/08)
- Windows XP & Vista compatibility – final wrap of fixes that provide default installation of eQUEST & DOE-2 data and project files to directories that Win XP & Vista allow write access to, along with changes to a variety of debug file writing also to write/accessible directories. (9/08)

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eQUEST v3.62c, build 6236 – internal/limited release ~4/4/08 – w/ DOE-2.2 v45a1

Additions / Enhancements:

- Oregon energy code wizard defaults – added Oregon code jurisdiction, climate zone and wide variety of defaults to the wizards so that Oregon building models generated in the wizard reflect Oregon energy code requirements. (3/08)
- Canadian locations – added access in the wizards to 103 new Canadian locations (that reference 68 newly generated CWEC weather files) provided by developer partners at NRCan (Natural Resources Canada). (2/08)
- Whole building EEM run – final fixes and wrap to new feature enabling “whole building” EEM runs where the user has access to the full SD/DD wizard interface to define EEM runs. (2/08)
- Detailed UI - additions to enable access to WINDOW-LAYER components within the building spreadsheets and parametric run dialog. (12/07)
- Detailed UI - additions to enable access to GROUND-LOOP-HX components within the building spreadsheets and parametric run dialog. (9/07)
- Exported CSV results file – generation of results CSV export containing monthly peak-day electric hourly profiles by enduse and enable batch processing mechanism to export hourly results CSVs. (7/07)

Fixes:

- Wizard lighting profiles – fix to critical bug preventing accurate population of wizard lighting profiles to the DOE-2 (BDL) building model. (4/08)
- Skylight parametric runs - fix to skylight parametric run bug related to scaling of values reported in results graph. (3/08)
- Parametric run dialog – fix enabling access to keywords with multiple array elements. (2/08)
- Parametric runs – fix to mechanism that enabled parametric runs to alter (and be defined by) global parameter (PARAMETER) data. (9/07)
- DWG file deletion – fixed critical bug where certain DWG files could be deleted from users computer by the CAD File Browse dialog when the dialog fails to load a bitmap image contained within the file. (9/07)

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eQUEST v3.62, build 5730 – internal/limited release ~6/28/07 – w/ DOE-2.2 v44e6

(First version of this change/fix log)

Additions / Enhancements:

- Project tree component deletion – final wrap of feature enabling the deletion of an entire branch of building components from within the project tree. (6/07)
- Tutorial access – new feature within the wizard and detailed interfaces to access various tutorials (both PDF & XLS) loaded on the user’s computer. Initial set includes Introductory Tutorial, Life-Cycle Costs, Modeling Procedures Quick Reference, DOE2Glass Library and Detailed Simulation Reports Summary. The listing of files accessible via this mechanism is based simply on the contents of certain directories in the \Tutorial subdirectory of the main

"data" directory, thereby enabling users to add their own PDFs & XLSs for direct access within eQUEST. (6/07)

- Daylight control modeling – final wrap of new daylight modeling within both the wizard and detailed interfaces. Features include upgraded DOE-2 modeling capabilities (particularly skylights, light tubes and control schemes) and Title-24 2008 primary/secondary daylit area and daylight control positioning capabilities. (6/07)
- Title-24 compliance analysis – new features to populate Joint Appendix IV construction inputs based on inputs specified in the wizard, DX PIU revised rules to ensure EER95, SEER & cooling capacity inputs are flagged as required inputs for permit analysis and DOE-2/BDL default updates. (6/07)
- Title-24 compliance analysis – new features to enable the compliance analysis of hot water and chilled water loops with process loads attached. (6/07)
- Title-24 compliance analysis – new feature to enable compliance analysis using WINDOWS specified with GLASS-TYPE-CODES. (6/07)
- Title-24 compliance analysis – new features to handle compliance analysis of additional system types including IU and PVVT. (6/07)
- Title-24 compliance analysis – new feature to handle variable flow exhaust systems in compliance analysis. (6/07)
- Title-24 compliance analysis – new feature to handle DX PIU systems in compliance analysis. (6/07)
- Wizard HVAC system types – addition of six new HVAC systems (package DX series/parallel fan powered VAV with electric resistance, hot water or no heating). (5/07)
- Wizard construction – completed new options to create/assign custom constructions for roof, exterior wall and non-earth-contact ground floors, including assignment of these constructions to roofs or exterior walls for individual zones via the Zone Characteristics button on the Footprint screen. (5/07)
- Parametric run UI help – enable access to DOE-2 item/topic help from within parametric run dialog. (4/07)
- Parametric run definitions – added new feature enabling parametric runs to be defined by navigating to & selecting a separate .INP file, along with a variety of new parametric run dialog enhancements. (4/07)

Fixes:

- BDLUIData not found – fix to prevent "BDLUIData info not found" error from getting user into endless loop requiring shut-down. (6/07)
- Help file access – fix problem where accessing the help file from within measure creation wizard screen bombs the program. (5/07)
- Wizard ventilation – fixed problem with wizard ruleset default to ensure the proper non-residential VentMethod defaulting. (11/06)