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AIR-SIDE FEATURES
Variable Speed Rotary VRF

**Details**: Added simulation performance curves for variable speed rotary compressor VRF condensing units. With this addition, HAP now offers three types of performance models for VRF: variable speed rotary, variable speed scroll, and digital scroll.

Figures show the HAP detailed input screens.
Variable Speed Rotary VRF

**Details:** Inputs specify capacity, EER, COP, compressor type, and controls. During energy simulation HAP applies these inputs to the performance curves to create a scaled performance model for the VRF condensing unit. The model then calculates how efficiency changes each hour with changing operating conditions.

Figures show the HAP wizard screens.
Details: ASHRAE Standard 62.1-2013 ventilation defaults has been added, as well as Ventilation Rate Procedure sizing calculations.
Ventilation Sizing Summary Report

Details: New layout for terminal systems clarifies sizing of zone ventilation airflow and DOAS airflow:

New table summarizes system ventilation requirements

Zones now listed separately, with individual per-zone totals. This better reflects actual sizing calculation procedures.
DOAS Terminology

**Details:** Updated terminology to consistently use “Dedicated Outdoor Air System” (or DOAS) throughout the program.
WIZARD FEATURES
Waterside Economizer for Air-Cooled Chiller Plants

**Details:** This feature models a cooling tower used for direct cooling duty alongside air-cooled chillers, when ambient conditions allow. Integrated and non-integrated configurations are supported. This complements existing features for water-cooled chiller plants.
US Energy Information Administration (EIA) Rates

**Details:** The Utility Rate Wizard has been updated with 2014 EIA rates for gas and electricity. (2014 data was the latest available at time of release.)
Interoperability Among Wizards

1. Weather location automatically selects EIA utility rates (where available)

2. Building type automatically selects equipment operating schedule

Automatic selections can be overridden
OTHER FEATURES
**Import from Carrier Building System Optimizer**

**Details:** Projects created in Building System Optimizer (BSO) can now be loaded into HAP. Once imported, full HAP capabilities can be used.

This facilitates scenarios where schematic design was done in BSO but further detailed design or analysis is required.
Export to Comma Separated Values (CSV) Files

**Details:** CSV is a common file format compatible with spreadsheets such as Microsoft Excel and other software. Energy simulation results for air systems, plants, and buildings can now be output in this format.
Bugs / Corrections

The following problems were corrected:

1. **Air System Inputs** – When the “90.1 Appendix G Fan kW” option was selected for supply fan performance, the button to display the A-Factor Calculations input screen appeared in the wrong position on the screen, obscuring other inputs.

2. **System Design Reports** – For an induction beam or active chilled beam system in which a zone contains multiple spaces, and in which the zone primary airflow is set by induction supply requirements rather than outdoor air ventilation requirement, the Ventilation Sizing Summary report showed incorrect Voz values for spaces in that zone. This was a cosmetic error. Calculation of ventilation airflow requirements for the system was correct.

3. **Building Simulation I** – It was possible to create a complex electric rate with zero energy charge steps. If that electric rate was used in a building simulation an error message appeared.

4. **Building Simulation II** – The unmet load hours shown on the LEED EAc1 report incorrectly included unmet loads for service hot water (SHW), but should only contain data for space conditioning. This only occurred for projects modeling a standalone SHW system.

5. **Building Wizard** – When a wall, roof, or window assembly created in the detailed user interface was selected in the Building Wizard, the overall U-value was shown as zero. In addition, an error occurred when generating the Building Wizard input report. These were cosmetic errors; inputs were successfully transformed into spaces, assemblies and schedules for the detailed HAP interface and were reliable for use in load calculations and energy simulations.

6. **Utility Rate Wizard** – When price data for remote steam was entered, it was incorrectly assigned to the remote hot water meter in the building.

7. **Reports** – Under specific conditions an “Error 521: Unable to open clipboard” error occurred when generating certain reports.

8. **gbXML Import** – For a very specific set of conditions the gbXML Import feature linked the wrong window or door assembly to spaces. This only occurred when window names exceeded 30 characters, and the first 30 characters of each name matched other names.

9. **Example Problem Results PDF** – Example problem results listed in the *Example Problems Results* PDF document did not match results produced by the HAP v4.9 example problem. This PDF document is used by customers performing validation of the program.
QUESTIONS?

If you have any questions about Carrier Hourly Analysis Program v5.0 please contact Carrier Software Systems at

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Thank you!