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Reducing the number of unmet load hours in TRACE

With the popularity of ASHRAE Standard 90.1 and LEED®, many TRACE users are concerned about the number of hours buildings are not meeting load. An unmet load hour is defined as an hour when the building load is in excess of the design coil capacity by one percent or greater and one or more rooms are 1.5 degrees Fahrenheit beyond the room setpoint. LEED certification and ASHRAE 90.1 compliance mandate specific limitations regarding unmet load hours. The following are just a few strategies users can implement to reduce unmet load hours within TRACE.

The first strategy is to review the Building Temperature Profiles report. This report can help the user determine which rooms and zones are experiencing unmet load hours. The report may also reveal trends between rooms in systems. If this is the case, the rooms could be rezoned. In addition, the user can verify that the rooms have a similar setpoint.

Narrowing the gap between drift points allows the equipment to achieve occupied setpoint faster, thus reducing unmet load hours. When the building is unoccupied, drift temperatures are used as building setpoints. Once the building becomes occupied, it may be the case that the HVAC equipment may not be able to handle the increased load and setpoint change if there is a wide variance between setpoint and drift point.

Unmet load hours can also be reduced by applying an optimum start schedule. This control scheme allows the building automation system to condition the spaces before a building becomes occupied. Therefore, the building is conditioned to occupied setpoint when people enter the structure.

A final strategy is to increase the plant and coil capacities in order to increase the building's ability to respond to changing conditions. This can be done by linking Airside Coil Capacity to Plant Capacity in Change Energy Parameters. The plant capacities can then be increased which will increase coil capacity.

Accurately Model ASHRAE Standard 90.1-2004 in TRACE

Have you ever questioned how to model ASHRAE 90.1-2004 in TRACE? The ASHRAE 90.1 -2004 library was created in response to confusion when users attempted to model various cooling equipment in TRACE. The library offers a minimally- compliant equipment library to assist with answering questions regarding part-load efficiency, packaged unitary, heat rejection and more. In addition it provides a step-by-step guide to help users understand how it works.

One of the most common questions asked is "Why doesn't the full load rate for some of the packaged equipment match the table values?" The user must understand that the full load rate is a 'packaged' number. This number includes energy from the supply fan, the condenser fan, and the compressor. Within TRACE, these three components are located in different areas of the library; the Fans tab in Create Systems, Heat Rejection library, and the Cooling Full Load Rate in Create Plants. The guide (TRACE 90.1-2004 Library.pdf) provided with the library download describes these components in detail.

Another question often asked is "What if I don't agree with the library numbers?" The intention of this library is simply to help users start the modeling process. It also provides an understanding of how to effectively input values in TRACE. The values used in the library were derived based on certain assumptions so adjustments will need to be made for various applications. The guide (Trace 90.1-2004 Library.pdf) explains the methods and assumptions used to create the library and should be referenced to assure accurate full load rates for each project.

Frequently Asked Questions

How can multiple files be combined?

This functionality is often used when collaborating on large projects. The building is divided among multiple users and then merged into one file. To merge files go to File/New and select New Files Based On. The steps for merging files can be found in the User's Manual Trace 700, Chapter 6, pp. 149-151 or by going to the electronic version of the documentation at cds\trace700\documentaion folder.

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Current Software Versions

TRACE 700 Family v6.1.3
System Analyzer v6.0.3
Engineering Toolbox v4.0
Trane Acoustics Program (TAP) v3.0.2
TOPSS v8.5
VariTrane Duct Designer v3.05.51
Trane Pipe Designer v3.0.1.18

Why archive a file?

Archiving creates smaller file sizes which makes projects more portable for e-mailing or transferring between computers. In addition, when the archive option is selected the program will collect all associated information including the custom library members.

TRACE compresses the file and creates a .taf (TRACE Archive File) file extension. This ensures that the custom library members that were created for the project stay with the file.

Why doesn't the recurring/additional cost information entered, display in System Analyzer?

Make sure that you have entered at least a one for the depreciation life taxes field.

How is Purchased Chilled Water modeled in TRACE?

The Chiller Wizard is a new application available in Chiller Plant Analyzer and TRACE version 6.1.1. When open, the program displays corresponding information from the TRACE User's Manual. A Detailed Help button will open the Help file for more in-depth information if needed. When selecting this option in the Cooling Plant section of the program it will step you through the required inputs. The TRACE 700 User's Manual, Chapter 3-1 and the electronic version in cds\trace700\documentation will also include the modeling information.

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