DOE-2 Articles from the *Building Energy Simulation User News*

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RESYS

The DOE-2 Basics manual says that you shouldn't use RESYS if you have unconditioned spaces, i.e., attics or crawl spaces. If I do have unconditioned spaces but don't want to use the operable window feature of RESYS should I just use the PSZ system? If yes, what defaults should I use to override for a residential system? If no, what system should I use and are there precautions?

I would also like to use the SUM system which is not discussed in the DOE-2 Basics manual. The DOE-2 Reference manual says you cannot get the SUM of unconditioned spaces. If I specify SUM for the conditioned space will it calculate the temperatures for unconditioned spaces to pass on the real load for the conditioned space?

Answer from Fred Buhl
I can't think of a any reason not to use RESYS with unconditioned zones. The zones should be denoted as unconditioned. DOE-2 will calculate air temperatures for them. The big deal with RESYS is that it can't include outside air. For that you need to use RESYS2 (basically PSZ with different defaults and on/off fan).

As far as I know, SUM has no problem with unconditioned zones, either. The temperatures will be calculated but there will be no heating or cooling for the unconditioned zones.

Answer from Joe Huang
I think the warning about not using RESYS for unconditioned spaces is really a warning about the capabilities of DOE-2 itself to correctly model floating temperature conditions. I agree with Fred that I see no reason for using some other system instead of RESYS for modeling unconditioned spaces. In fact, RESYS has the benefit of modeling natural ventilation through attic and crawl space vents, so I would argue that RESYS would give you more realistic results.

I don't have much experience in using SUM, though I assume if you use SUM with very low heating and very high cooling setpoints, you would, in essence, get the same floating condition as you would get with RESYS (or any other system); the only difference being that with RESYS you can model some natural ventilation.

You might want to check out "*Improving DOE-2's RESYS Routine: User-Defined Functions to Provide More Accurate Part Load Energy Use and Humidity Predictions*" August 2000, LBNL-46034 http://gundog.lbl.gov/dirpubs/46304.pdf

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SHADING DEVICES

In DOE-2, can external shading devices be modeled with a shading coefficient or a transmittance value, or are they always assumed to be opaque?

Answer
Yes, you may put a SHADING-SCHEDULE on an exterior shade to change its transmissivity as desired.

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OUTPUT FILES

I am trying to get the ground temperatures from DOE-2.1E. The DOE-2 manual on "Libraries and Reports" states that the ground temperature is GLOBAL variable with a variable list number 2. From some examples I have noticed that we need to add 4 to the stated list number for GLOBAL outputs. When I specify 8 as the Variable list I get the expected dry bulb temperature as the output. I am assuming that I should specify 6 for the ground temperatures. However I get the current hour as the output instead. Please let me know how I could get the ground temperatures.

Also, I am trying to output the BUILDING-LOADS variable list no 10 (building lighting heating loads). When I specify the Variable-Type = BUILDING or even BUILDING-LOADS. I get an error "symbol previously undefined." Please let me know what is to be specified as the VARIABLE-TYPE to get the building loads.

Answer
You have to be careful in distinguishing Hourly-Reports for LOADS versus SYSTEMS or PLANT. From your description, you are extracting the GLOBAL variables in SYSTEMS, where variable 6 (ISCHR) is the current hour of simulation, and 8 (DBT) is the dry bulb temperature (see DOE-2.1E Supplement, p. A.16). Ground-temperatures in Rankine are available as GLOBAL variable 2 (TGNDR Ground temperature, Rankine) in the LOADS hourly-report (see DOE-2.1E Supplement, p. A.2). Therefore, you should try moving your HOURLY-REPORT commands from SYSTEMS to LOADS.