Best Practice – NEAT: Mandated Entries (Attics/Windows)

Date: Revised January 5, 2017

Subject: NEAT: Mandated Entries (Attics/Windows)

Problem or Question #1: I have noticed that when I determine an added R-Value in the "Added R-Value" field in unfinished attics it has some effect on the other measure SIRs. We are required to use certain R-Values for attic insulation by local building code and current IRC, but when I specify to add specific R-Values in the attic in NEAT it seems to have an effect on the other measures in NEAT. How should we optimize this Data entry?

Discussion: Infiltration Reduction will always be considered first because it describes the tightness of the building and consequently affects all other measures. After Infiltration Reduction, all other energy-saving measures are usually evaluated in NEAT from highest SIR to lowest SIR. This makes sure that the most cost effective measures are considered first in the NEAT audit. For example: Attic 1 has an SIR of 2.5, so it is considered *before* wall insulation that has an SIR of 1.2. This makes sure the more cost effective measures are performed first. There are, however, some exceptions to this general rule of SIR-based ordering of measures. Any measures made "mandatory" by the user will insert between Infiltration Reduction and the highest SIR. Mandating an action will result in giving those mandates precedence over normally (naturally) ranking measures, because this does not allow NEAT to evaluate each measure. A "user-mandated measure" specifies (or mandates) that a particular measure be included in the audit measures *regardless of the measure's SIR*. An example of this would be mandating a specific amount of insulation in the attic, instead of allowing NEAT to determine what the most cost-effective level of insulation is for the home.

- Prior to mandating a specific R-value, first allow NEAT to evaluate all measures. NEAT will typically rank insulation. If it does not and you specify the R-value you want to add, NEAT will position this measure before most others to make sure it is performed first. For example: you select R-38 as the *added R-value* in the unfinished attic section of the audit. This mandatory level triggers the exception (to the SIR-based ordering of measures) and NEAT will consider this particular measure after Infiltration Reduction. Now some measures that would have ranked might not rank because of the new order of measure placement and the higher level of insulation in the building post retrofit. This change is effected on all the NEAT logarithmic permutations and calculations. Check to see if any NEAT approved measures were dropped from your mandate.

- Example situation: I have a furnace that ranks with an SIR of 1.1; in other words, it is just barely cost effective enough to qualify for weatherization. Now I decide to name my level of insulation by entering R-38 as my *added R-value* in unfinished attics. The R-38 was specific and mandatory per our local codes and therefore will be considered first. It also reduced the cost-effectiveness of the furnace making its SIR only a .8. Now we can no longer replace the furnace because it is not cost effective with the higher R-value in the attic.

Recommended Action: Run the audit with no selection in the "*added R-value*" section of unfinished attics in the audit and take note of the measures recommended by NEAT. Print a copy of the first NEAT audit. If the amount of insulation NEAT recommends is lower than the current IRC requires (or local building code whichever is more stringent), add the amount required by code into the added R-value field in unfinished attics. Re-run the audit with the new mandated R-value selection and take note of any

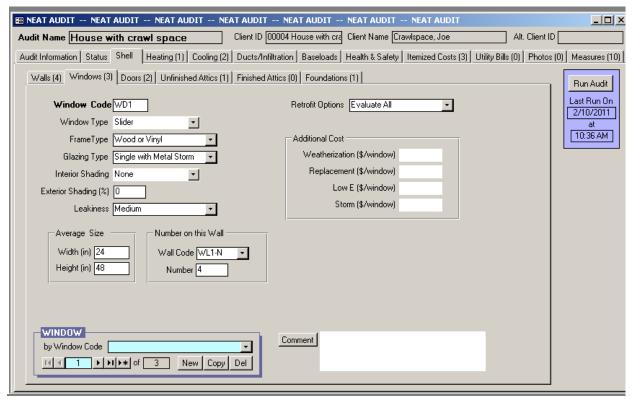http://www.tdhca.state.tx.us/ea/wap.htm

changes in the recommended measures making sure other measures have not fallen below the SIR of 1.0. REMINDER: Whenever your whole-house-assessment disagrees with NEAT you should re-examine all associated data-entry in NEAT, the Setup Library, and the Supply Library (see the "Unit Replacement" Best Practice). Follow the NEAT recommendation. If NEAT and your whole-house-assessment still disagree, then consult with Department program staff. Remember to document any reason(s) for not following NEAT (for example: code requirements or case-by-case authorizations by program staff) and include that documentation (especially photos) in the client file.

The NEAT has a function which, as discussed in question 1, determines the funds justified to achieve infiltration reduction. To make this determination you will need to estimate the total cost of the counter-infiltration measures on the "Air and Duct Leakage" tab under the "Ducts/Infiltration" tab in the NEAT audit. The amount entered is based on the experience of the auditor and his or her knowledge of what CFM reduction has historically been costing the agency. If the amount placed in the "Costs: Infiltration Reduction ($)" section of NEAT generates an SIR less than one, then NEAT is telling you that you probably overestimated the price of counter-infiltration (or your contractor's CFM reduction costs are too high to generate an SIR). In either of these situations, the "Costs: Infiltration Reduction ($)" will need to be revised and a lower "Costs: Infiltration Reduction ($)" value used in the NEAT audit; this will likely result in an SIR greater than one. Refer to the other Best Practices posted to provide additional guidance for identifying the most cost-effective ways to air seal throughout the house.

Recommendation Summary: Be aware of the relationship between infiltration, insulation, and mechanical systems. They all interact with each other and need to have careful consideration taken when measures are recommended, especially when the auditor makes them mandatory. Keep in mind it is always our goal to ventilate the house according to ASHRAE, then tighten the house as low as possible, and insulate it to the highest levels (that are still cost-effective, i.e. SIR>1).

Problem or question #2: When we are inside the audit and are selecting what type of measures (options) we want NEAT to consider, should we only select the type of options we want to install based on the situation or should we select the "evaluate all" selection? For example, should we only select the type of windows we want to install, such as low-e, or should we run the audit with all window-types being eligible?

Discussion: The only way to ensure NEAT considers all measures are eligible when you run NEAT is to allow NEAT to assess the interactions of the entire home. Select "evaluate all" whenever it is an option so that NEAT will evaluate and select the most economical and effective package of measures for the dwelling unit. See the below screenshot for an "evaluate all" selection example.

Audit Name House with crawl space   Client ID 00004 House with cra   Client Name Crawlspace, Joe   Alt. Client ID

Audit Information | Status | Shell | Heating (1) | Cooling (2) | Ducts/Infiltration | Baseloads | Health & Safety | Itemized Costs (3) | Utility Bills (0) | Photos (0) | Measures (10)

Walls (4) | Windows (3) | Doors (2) | Unfinished Attics (1) | Finished Attics (0) | Foundations (1)

Window Code WD1

Window Type Slider

FrameType Wood or Vinyl

Glazing Type Single with Metal Storm

Interior Shading None

Exterior Shading (%) 0

Leakiness Medium

Retrofit Options Evaluate All

Additional Cost

Weatherization ($/window)

Replacement ($/window)

Low E ($/window)

Storm ($/window)

Run Audit

Last Run On
2/10/2011
at
10:36 AM

Average Size

Width (in) 24

Height (in) 48

Number on this Wall

Wall Code WL1-N

Number 4

WINDOW

by Window Code
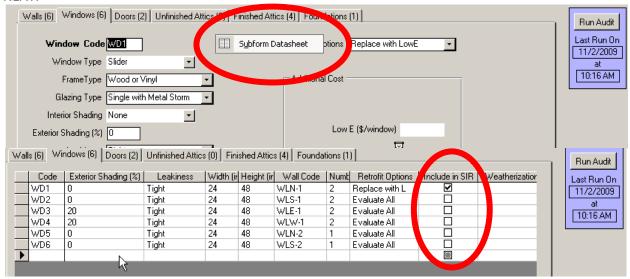
1 of 3   New | Copy | Del

Comment

There is an exception, however, to the general rule of "Evaluate all." In the case of a window that must be replaced because it is no longer serviceable (rotted wood, significantly warped frame, functionality problems, significant damage, etc.), then we need to first decide if that specific window can rank with an SIR greater than 1 **or** if we must replace the window as a repair measure.

We need to first allow the NEAT audit to determine if the window will rank on its own merit (this is accomplished by selecting evaluate all and running the audit). NEAT may select another measure, not recommend any measure, or it may recommend (rank) the window replacement on its own merit.

If the non-serviceable window does not rank on its own merit, and you still need to replace it because it is non-serviceable, you can specify (mandate) a window replacement. If you specify the measure to be considered, (for example if you select "replace with low-e") then this user-mandated action "triggers" the exception (to the SIR-based ordering of measures) and "forces" NEAT to consider this particular measure first. Now the "replace with low-e" window measure will be considered before any other measures. This action will affect the SIR of other measures. In this case some measures that would have ranked may now not rank because of the effect of mandated change on all the NEAT logarithmic permutations and calculations.

To "mandate" a non-serviceable window to be repaired or replaced and included in the whole house SIR in the audit, check "weatherize, "replace" or "replace with low-e" instead of "evaluate all" in the retrofit options. NOTE: there is a minor glitch in the NEAT program which causes the SIR box to disappear when one of these options is chosen. Despite the fact the SIR box disappears, it is nonetheless very important to include the measure in the whole-house SIR. Therefore you should go into the "subform datasheet" by right-clicking in the gray area background near the measure box. Clicking in the gray background will result in a small "subform datasheet" option button popping up. After you select this button, a larger spreadsheet subform datasheet will pop up. On the spreadsheet you should find all the windows

http://www.tdhca.state.tx.us/ea/wap.htm

including the non-serviceable window measure you are working on; check the "include in SIR" by that measure so that the measure is treated as a repair and not treated as a Health and Safety measure by NEAT.

Recommendation Summary: Always select "evaluate all" whenever it is an option in NEAT before using any overriding considerations that calls for a "mandated" window replacement, as discussed above. NEAT may 'naturally' rank that window without the mandate.