B9. Energy Audits

1. Certified Energy Auditor

a. General

i. All persons who conduct energy audits must be a Certified Energy Auditor recognized by the Housing and Community Development Division (HCD) or hold an Auditor in Training validation from the IWTC. A Certified Energy Auditor is required to hold the BPI Energy Auditor Certification and an IWTC Auditor Validation.

ii. Auditor in Training: An Auditor in Training must be supervised by a certified Energy Auditor, must meet the milestones in their training plan, and shall be certified within a reasonable period of time (typically within 12 months).

iii. Auditor in Training Validation: An individual must show an initial level of competency and recieve an Auditor in Training Validation from the IWTC before conducting any energy audits. The IWTC will work with the Agency and the individual to develop an Auditor in Training plan. The plan will include a timeline, a description of how certification requirements will be met, and will identify the certified Energy Auditor who will supervise the Auditor in Training.

iv. Local agencies may contract out energy audit services to other certified energy auditors if needed.

v. The HCD reserves the right to revoke the validation of any energy auditor or Auditor in Training per Guidelines D2.7.

2. Approved Audit Tools

a. General:

i. The Weatherization Assistant (NEAT/MHEA Audit) as approved by HCD and the DOE shall be used by all agencies to conduct audits on site-built and factory built homes. The audit tool will be used in determining the Savings to Investment Ratio of each weatherization measure and the correct priority of weatherization improvements for each dwelling unit.

ii. The current version to be used is:

Version 8.9
http://eber.ed.ornl.gov/pub/weatherization/Weatherization%20Assistant%208.9/WA%208-9-0-5.exe

iii. The HCD received approval to use the Weatherization Assistant ver. 8.9 (NEAT/MHEA) from DOE as listed herein in August 2015. HCD will not be required to reapply until 2020.

iv. The NEAT audit will be used for all single family homes and buildings with 4 units or less with the exception of factory built homes, as defined in *Attachment #26.*

v. The MHEA will be used on all single family factory built homes, as defined in *Attachment #26*, except as described in vi.

vi. Either the NEAT or MHEA audit can be used for factory built homes where the building envelope has been altered with light conventional framing, factory built homes installed on conditioned basements, and modular homes. Auditors should select the audit tool which will provide the best opportunity to maximize the energy savings for these irregular combined construction types. **The key to this exception is the inclusion of Site-built conditioned space to the factory built home.**

vii. Utah does not have an approved multi-family audit tool. Contact the State for guidance prior to accepting any application of a project larger than 4 units. Multi-family buildings with be audited with EA-QUIP, and will be reviewed by HCD and DOE.

b. Weatherization Assistant Program Setup

The local agencies are responsible for the setup of the Weatherization Assistant. To maintain consistency between the local agencies the State is instituting the following:

i. The local agency is responsible for database preservation. This preservation should follow the agencies record retention policy.

ii. A list of mandatory Audit Library Measure settings is included in *Attachment #7 Library Measures.*
   a. This list establishes the maximum life of each library measure.
   b. It indicates which library measures are required to be active or inactive.
   c. This list is reviewed at least annually by HCD and updated as the need arises.
   d. Agencies must adjust their Library Measure settings to reflect any updates or changes made to this list.

iii. Agencies are required to have estimated measure costs for all active measures.
   a. Measure costs should include all materials and labor needed to meet the requirements of the SWS, field guides, and program guidelines for the measure.
   b. Measure Costs must represent the average actual cost of each measure to ensure that dwellings are evaluated accurately and equitably for all allowable measures.
   c. Measure costs cannot be inflated to avoid performing the measure.

iv. Agencies are required to update their Measure Costs at the beginning of each new program year (July 1), and whenever there is a significant change in a cost factor. Updates should include the Library Measure Costs and any User Defined Measure Costs.

v. Agencies are responsible to maintain uniformity in measure costs across all devices used to run energy audits.

vi. When changes are made to any setup parameters, agencies must ensure steps are taken to preserve the existing database information so historical audits will not be altered. Agencies shall document the changes using *Attachment #7 Audit Setup Library Change Log.* A current copy of this Change Log shall be kept at the Agency.

vii. User Defined Energy Conservation Measures (ECM's) are established and approved by HCD and listed in Table 3 below. Approved User Defined ECM's must be created and active in an agency's library of measures. User Defined ECM's have a method for calculating energy savings. Default values are listed in the Approved User Defined ECM's Table below. *Note: There is currently only one approved User Defined ECM*

Table 3: Approved User Defined ECM's (Energy Conservation Measures)

Measure Name	Include In SIR	Measure Type	Units	Default Amount*	Fuel Saved	Life** (yr)	Site Built	Mobile Home
ECM Motor (Electronically Commutated Motor)	✔	HVAC Systems	kWh	400	Electricity	15	✔	✔

*Either the Default amount, or a calculated amount can be used when running the audit. If calculated amount is used, a copy of the calculations must be included in the client file.
**Life of measure can be adjusted to the expected remaining life of the furnace.

viii. Minimum Acceptable SIR—Under Setup Library → Key Parameters, the *Minimum Acceptable SIR* shall be set to 1.0 in both the NEAT and MHEA.

ix. Fuel Costs—will be provided to the agencies on an annual basis from the results of the fuel survey conducted by HCD (see Attachment #16 Utah Fuel Costs). Agencies must adjust their fuel costs by effective dates each year, and must ensure steps are taken to preserve the existing database information so historical audits will not be subject to the new costs. In areas where the local agency has multiple fuel providers

the agency may average like fuels with similar cost or create separate Fuel Cost Libraries. This should be reported in the Agency's Weatherization Operations Plan submitted to the State.

x. NEAT Insulation Types—should list only allowable insulation types for each category. Each category should have at least one type listed. The R-values should align with manufacturer specs for each type of insulation the agency uses, and costs for each insulation type (listed under the Library Measures) must be economical and must represent the average actual cost. Where there are multiple feasible options for insulation, efforts should be made to select the insulation type with the highest SIR.

xi. Weather File—selection for the NEAT/MHEA weather file shall be based upon the physical location of the client home. Since there are many variables in these weather files HCD has selected which files will be used. The local agencies will select the file from the following:

a. BRAG = Pocatello, ID
   Rich County = Rock Springs, WY

b. UBAOG = Rock Springs, WY

c. 5 County AOG =
   Washington County below 4000' = Yucca Flat, NV
   above 4000' = Cedar City, UT
   All other areas = Cedar City, UT

d. SEUALG =
   San Juan County below 4500' = Yucca Flat, NV
   above 4500' =Salt Lake City, UT

e. All other agencies below 4500' = Salt Lake City, UT
   above 4500' = Cedar City, UT

3. Energy Audit Prioritizations

a. General

i. Audit Determines Work—The NEAT/MHEA audit shall be used to determine all work to be done on a dwelling. Any work to be done on a dwelling must be documented and justified in the audit reports. ***No weatherization work may be conducted or funds expended on a client home without first completing the appropriate NEAT/MHEA audit.***

Exceptions:

- No Heat Crisis
- Life safety situation

ii. Cost Effective Measures—Stand Alone Energy Conservation Measures (ECM's) and each package of measures which includes all ECM's and all Incidental Repair Measures (IRM's), must be "cost effective" as defined by DOE. "Cost Effective" means that each measure and package of measures installed in a dwelling unit must have a savings-to-investment ratio (SIR) which meets or exceeds 1.0. Under NEAT/MHEA, a measure shall only be implemented where the savings to investment ratio (SIR) of that measure is a minimum of 1.0

iii. Measure Prioritization—The priority listing of activities will be based upon NEAT/MHEA Savings to Investment calculations and is limited to the ECM's listed in the NEAT/MHEA *Recommended Measures* report.

iv. Measure Skipping or Cherry Picking—By rule and policy, the energy audits will determine the optimum set of cost-effective measures and will prioritize those energy saving measures in order of cost-effectiveness. ***Each dwelling should be evaluated for all eligible measures.*** Once approved, all of the prioritized Energy Conservation Measures (ECM's) from the audit that meet the SIR ratio requirement must be installed in the unit in the order of cost-effectiveness. Deviating from the audit prioritized list of measures would be in conflict with the intent of the rules and is prohibited.

v. Declined Measure—If a client declines a measure, appropriate client education should be used to attempt to eliminate the client's concern. If after explaination and discussion, the client still declines the measure and the ***auditor deems the reason for declining the measure as legitimate***, the auditor should complete all other weatherization measures and include in the audit file a comprehensive explanation of the rationale for skipping the specific measure. If the ***auditor deems this is not a legitimate reason for declining the measure***, the situation must be fully documented in the audit file. Only those ECM's which are more cost-effective than the refused measure can be installed, and only those Health & Safety Measures (HSMs), Incidental Repair Measures (IRMs) and Non-Audited Measures (NAMs) which are required for the safe and effective installation of the more cost-effective ECM's can be installed. The Client must be informed in writing that the home cannot receive further work after completion, and a copy of this notification must be included in the audit file (See WPN 13-5 FAQs).

Some Examples of legitimate reasons for declining a measure could be:

- Declining exterior door replacement to preserve aesthetics of home.
- Declining refrigerator replacement because the replacement would not have the same features as the current refrigerator.

vi. Evaluate All—When selecting replacement options in the audit NEAT/MHEA tool, "*Evaluate All*" should be used ***wherever possible*** to allow the audit tool to evaluate for all active measures and to select the one with the highest SIR. If Evaluate All is not selected, an allowable justification must be listed in the comments section of the measure.

Some examples of situations when Evaluate All would not be selected are listed below: (See the Measure specific sections of B9.8)

- Replacing Furnace as NAM
- Replacing AC as NAM
- Basement Window does not meet egress.
- Windows are new and low-e double pane.

vii. Fuel Switching or Fuel Conversions—The general practice of non-renewable fuel switching when replacing furnaces/appliances is not permitted; however, Fuel Switching is allowed when changing or converting a furnace/appliance using one fuel source to another on a limited, case-by-case basis.

a. Use of DOE funds is not permitted.

b. Use of LIHEAP and LIHEAP Crisis are permitted when there is a demonstrated SIR of 1 or greater using *Attachment 7 Fuel Conversion Calculator*.

c. The SIR for conversion from electrical, fuel oil, propane, & coal to natural gas shall be calculated using *Attachment 7 Fuel Conversion Calculator*. **All other fuel conversions shall be reviewed and approved by the State WAP office.**

d. Landlords will still be required to pay 50% of the material and labor cost on rentals, provided the entire labor and material cost audited is at 1.0 or greater before the co-pay**.** (See Section C4 Income Property for the specific rules) **Buy downs are not allowed.**

e. The energy savings of all ECM's shall be calculated based on the post-weatherization, post-fuel conversion, heating and cooling source. When doing a fuel conversion on a dwelling the Heating and Cooling tabs of the NEAT/MHEA audit should list the new heating and cooling systems as the replacement systems in order to allow the audit to accurately calculate the SIR of all ECM's effected by the heating and cooling loads. Since the NEAT/MHEA audit is not designed to evaluate for fuel conversions, auditors will have to select the new fuel source on the Heating tab, and will have to make up the imputs for the existing equipment as a work around. See B9.8 HVAC for additional instructions.

4. Energy Auditing On-Site Procedures

a. On-Site Visit

i. Agencies shall conduct a thorough energy audit of each approved client home prior to beginning the weatherization process. During the on-site visit the Auditor shall collect the following baseline data and record it in the client file.
   a. NEAT/MHEA data collection. All applicable data pertaining to the building envelope necessary to run a complete energy audit (data about windows, doors, appliances, existing insulation, etc.) shall be gathered using the agency's field collection forms.
   b. Photo documentation of existing pertinent conditions at time of audit.
   c. Pre-Weatherization Blower Door CFM_{50}
   d. Existing ventilation to estimate ASHRAE (Attachment #22)
   e. Health & Safety Assessment (Attachment #20)
   f. X-Ray Florescence (XRF) testing of painted surfaces that may potentially be disturbed during the WX process in all homes built or manufactured before 1978. Results should be summarized using the Lead Inspection Report (Attachment #28).
   g. Worst Case Draft/Spillage Testing (Attachment #9) of atmospheric vented combustion appliances
   h. Combustion Analysis of Appliances and ambient air
   i. Combustible gas leak testing
   j. Duct Leakage to the Outside testing (best practice)
   k. Additional Diagnostic testing:

      There are many additional diagnostic tests and other data that can be collected during the WX process which can be very helpful in preparing the work order for the unit and ensuring the health and safety of the client. Auditors should not just rely on their experience but also the building science and technology available. Some of these are: Duct leakage testing, Infrared Analysis, Zonal pressure diagnostics, etc.

b. Field Collection Forms

i. It is recommended that the energy auditor use a blank NEAT/MHEA Data Collection form during the audit to ensure all necessary information is collected. Some sample forms are available at:
   http://waptac.org/data/files/website_docs/technical_tools/audits_priority_lists/weatherization_assistant.
ii. If the agency desires to use their own forms they must ensure forms include all data fields the NEAT/MHEA audit requires.

c. Photo Documentation

i. Photographs of the pre-weatherization conditions of each dwelling should be taken. Photos should be organized and context should be included to describe the purpose of each photo as it pertains to weatherization.

d. Pre-Weatherization Blower Door Testing

i. A pre-blower door test is required on all dwelling units.
   a. Data shall be captured using TecTite® or approved equivalent software.
   b. Data shall be part of the audit file in hard copy or electronic format.

ii. If environmental, structural, or other reasons prevent a test, it is to be documented in the audit file.

iii. Blower door pre-tests should be performed after the following items have been addressed:

   a. Broken glass is replaced or a hole is temporarily patched.
   b. Major holes in building shell are repaired or temporarily patched.
   c. Evaporative cooler vents and window mount refrigeration units are sealed.

iv. Where the initial CFM 50 exceeds 4,000 on a dwelling unit the opportunity exists to make a significant impact to the home.

   a. The anticipated reduction under Air Infiltration in the audit tool should be calculated at 50%.
   b. The "Infiltration Credit" field on the ASHRAE calculator should also reflect a 50% reduction when running this for planning purposes.
   c. The agency should make every reasonable effort to achieve a reduction at least 50% on the post-blower door CFM50
   d. If a 50% reduction can not be achieved, a reasonable explanation must be included in the audit or on the QCI.

v. Where the initial CFM 50 is less than 4,000 on a dwelling unit :

   a. The anticipated reduction under Air Infiltration in the audit tool should be calculated at 30%.
   b. The "Infiltration Credit" field on the ASHRAE calculator should also reflect a 30% reduction when running this for planning purposes.

c. The agency should make every reasonable effort to achieve a reduction at least 30% on the post-blower door CFM50
d. If a 30% reduction can not be achieved, a reasonable explanation must be included in the audit or on the QCI.

e. ASHRAE Estimate

i. An assessment of the existing ventilation must be conducted as part of each audit, and recorded using the current ASHRAE calculator (Attachment #22). Auditors must measure the amount of air each exhaust fan is moving, estimate post-weatherization ventilation needs, and formulate a plan to achieve the needs. For additional information see also: Utah WAP Guidelines E2.F ASHRAE Inspection and E3.4 Building Ventilation.

f. Health & Safety Assessment

i. A Health & Safety assessment must be conducted at each dwelling prior to installing any weatherization measures. This assessment is to be performed by the auditor as part of the energy audit. The assessment must identify any actions that need to be taken to maintain the physical well-being of the occupants, to allow weatherization workers to effectively perform weatherization work, and to assess if any health and safety actions will become necessary as a result of weatherization work. Auditors are to use the Health & Safety Assessment form (Attachment #20) in conjunction with the Health & Safety Plan (Program Guidelines Section E) to conduct the assessment. This form must be completed by the auditor, signed by the auditor and the homeowner, and a copy must be in the audit file.

g. Lead Testing

i. Lead testing of all painted surfaces that may potentially be disturbed during the Wx process must be tested in homes built or manufactured before 1978. An X-Ray Florescence (XRF) analyzer must be used to conduct the testing. Results must be summarized using the Lead Inspection Report (Attachment #28). The Inspection

report and a copy of the XRF results shall be included in the audit file. The client shall be informed of the testing and the results.

ii. Agencies are not required to conduct a Lead Inspection (R307-842-3(2)), Hazard Screen (R307-842-3(3)), or Risk Assessment R307-842-3(4)) as defined by Utah Administrative Code. Since these defined inspections/testing would not ensure the sampling of areas where weatherization activities would be conducted.

h. Worst Case Draft Testing

i. A Worst Case Draft/Spillage Test shall be conducted on every client home as part of the energy audit. The purpose of this test is to document the current venting conditions of any combustion appliances and to determine if any corrective actions or a deferral are necessary. The Pre-Wx Worst Case Draft test should be documented using the Worst Case Draft Test form (Attachment #9) See also E3.5 Combustion Appliance Safety

i. Combustion Analysis & Combustible gas leak testing

i. A Combustion Analysis—shall be performed on ALL combustion appliances at the dwelling regardless of whether they are inside or outside the building envelope, and regardless of the appliances venting type. Auditors shall use the results to determine whether appliances are operating within safe ranges or if corrections are required. Results shall be documented on the Health and Safety Assessment, and a copy of the Combustion Analysis tapes shall be included in the audit file.

ii. Gas Leak Testing—All accessible gas supply lines shall be inspected for gas leaks as part of the Health and Safety Assessment. The results shall be documented on the Health and Safety Assessment form, and appropriate measures shall be taken to address any leaks found.

5. Four Measure Types

Everything we do in the Weatherization program shall be categorized in to one of the following four measure types: Energy Conservation Measure (ECM), Health & Safety Measure (HSM), Incidental Repair Measure (IRM), or a Non-Audited Measure (NAM).

a. ECM—Energy Conservation Measure:

i. An ECM is a procedure, including materials and labor, which is considered or performed for its anticipated energy savings (SIR of 1 or greater). An ECM often includes installation of ancillary items but will not include IRMs. The installed cost of all ancillary items associated with the proper installation of an individual ECM must be added to the cost of its ECM when calculating the SIR for the individual ECM. See Guidelines Section B8 for a list of Authorized ECM's.

   a. Ancillary Items: are items necessary for the proper installation of weatherization materials. Ancillary item refers to small items such as hardware, nails/screws, other fasteners, adhesive, sealant, etc., and not large-ticket items such as drywalling, roof/floor decking, rough framing, etc. (the latter are incidental repairs). Ancillary items are items required by materials manufacturers, general construction, and/or WAP field standards to achieve a finished product in a typical installation where no unusual or extensive repairs are needed. The costs of ancillary items and installation are to be included within the costs of an individual ECM when calculating the SIR for the individual ECM.

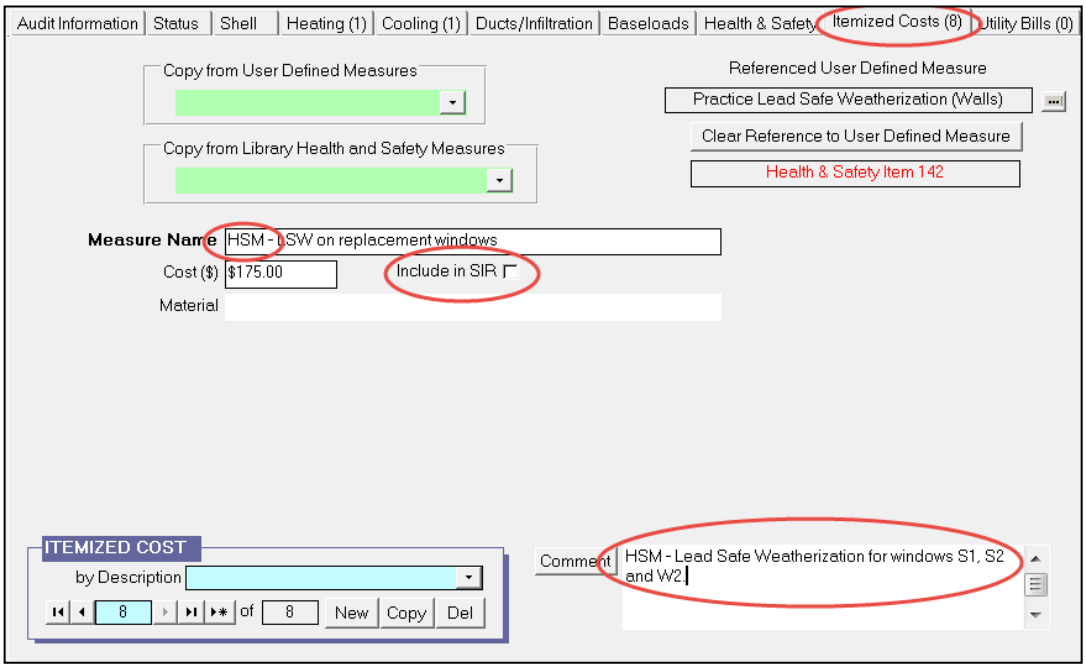
ii. ECM's do not need to be identified on the audit by the naming convention required with IRM's, HSM's and NAM's. Allowable ECM's are identified as recommended measures having an SIR of 1 or greater.

b. HSM—Health & Safety Measure

i. Health and safety measures are those actions necessary to maintain the physical well-being of both the occupants and/or weatherization workers where the ***actions MUST be taken to effectively perform weatherization work or the actions are necessary as a result of weatherization work***. The cost of an HSM includes associated materials and labor to install the measure. The cost of HSM's is to be tracked and reported separately, and is not added to the cost of any ECM's or to the cumulative SIR of the package. See Guidelines section E for approved Health & Safety measures and additional guidance.

ii. Auditors can use the predefined Health & Safety measures listed in the NEAT/MHEA system, and/or create as many User Defined Health & Safety measures as needed, as long as the HSM is an allowable Health & Safety Measure per Guidelines Section E3. ***Note: some of the pre-defined Health & Safety Measures are not allowable HSM's. Be careful not to select them.***

iii. All HSM's must be included on the energy audit. They should be entered as a Itemized Costs so they appear on the input report under the Additional Measures section. When creating an HSM, the "include in SIR" box should not be selected. HSM's must be identified as an "HSM" in the title of the measure. See example below:



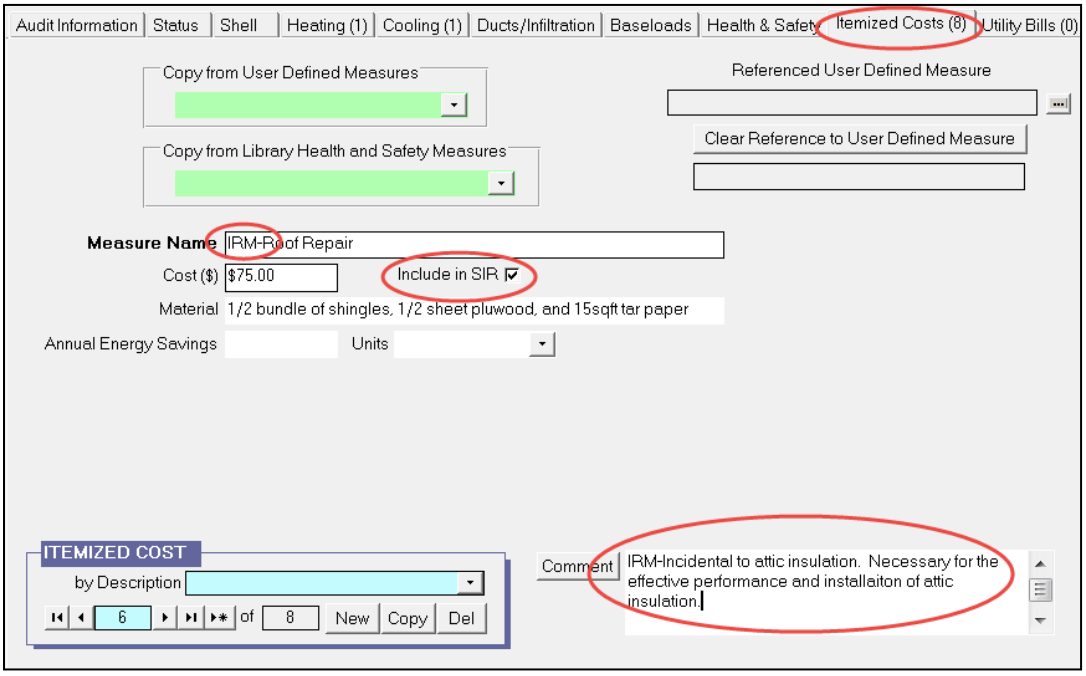
c. IRM—Incidental Repair Measure:

i. Incidental Repair Measures are those repairs which are ***necessary for the effective performance or preservation of one or more ECM's***. The IRM category is intended for a measure that is not typically part of the installation of an ECM, and is outside the manufacturers or industry standard for installation. IRM's either have no energy savings, or are beyond the normal scope of an ECM. Approved ECM's cannot be installed as IRM's. Some examples of IRM's are provided in the table below.

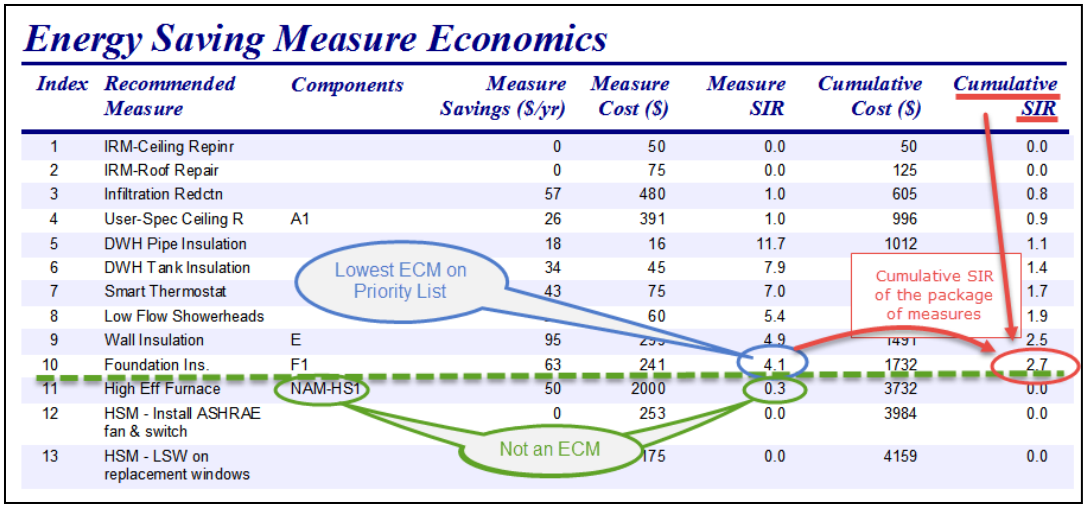
ii. IRM's should be audited as stand-alone measures, and their costs should be separate from ECM's and from HSM's. The cost of an IRM should include incidental repair

materials and labor. The IRM costs are not added to an individual or partial group of ECM costs. The total cost of all IRM's is added to the cost of the package of weatherization measures to calculate the whole unit or cumulative SIR. For each weatherized building, the cost of the total package of ECMs, added to the cost of all IRMs for the building, must have a cumulative SIR of 1.0 or greater.

iii. All IRM's must be included on the energy audit. They should be entered as a Itemized Costs so they appear on the input report under the Additional Measures section. The box next to "Include in SIR" must be checked so the measure will be included in the cumulative SIR. IRM's must be identified as an "IRM" in the title of the measure. The comments section must indicate which ECM(s) it is incidental to, along with an explanation of how each IRM is necessary for the effective performance or preservation of the ECM. See example below:



iv. When an IRM is included in a package of measures, an auditor must verify that the cumulative SIR is 1 or greater. The cumulative SIR is found under the Energy Savings Measure Economics section of the Recommended Measures report. The cumulative SIR of the package is the cumulative SIR of the lowest ECM on the priority list, or the last ECM on the list. See example below:



v. If a package of measures does not have a qualifying SIR (cumulative SIR is less than 1), it would be necessary to remove the combination of the ECM and its related IRM with the lowest SIR. If the IRM was deemed necessary for effective performance of the ECM, then both the ECM and the IRM must be removed in the attempt to meet the dwelling SIR. This process (removing the lowest ECM and its associated IRM) would continue until the package of measures (and each ECM) has a qualifying SIR. If one IRM is necessary to protect or enhance more than one ECM, (e.g. roof repair protecting attic insulation, sidewall insulation, and foundation insulation) then all of those ECMs together must be considered for removal until the SIR for the package of measures is 1.0 or greater. This process may result in deferral of the weatherization work until another funding source can be found to pay for the IRM(s).

vi. IRMs must be limited to those minor repairs necessary for effective performance or preservation of measures installed by the Sub-grantee.

Examples of IRM's, HSM's and Ancillary Items:

Energy Conservation Measure (ECM)	**Ancillary Items** (Cost must be included in SIR for associated individual ECM)	**Incidental Repair Measure (IRM)** (Cost must be included in SIR for whole unit package of ECM)	**Health and Safety Measure (HSM)** (Separate cost justification, Not included in SIR)
Attic insulation	Eave baffles, hatch dam, dams for heat producing devices	Attic vents, Minor roof repair to preserve insulation. Knob & Tube Wiring to allow for attic insulation	Minor repair of leaking roof that may create moisture/mold issue in attic insulation
Wall insulation	Sealing high and low openings in balloon framing	Sealing unusual openings as in void areas between double ceilings. Minor roof repair to preserve insulation	Minor repair of leaking roof that may create moisture/mold issue in new wall insulation
Floor Insulation	Dams for heat producing devices, fasteners	Water heater repair to prevent leaking and damaging floor insulation	

Air sealing	Fasteners for patches	Unusually large holes in envelope such as more than 1 sheet of sheetrock, patching materials and labor	
Attic hatch - (a required part of the larger air sealing ECM, sealing the access opening with a rigid lid and weatherstripping)	Items to complete proper construction such as: hold down clasps, handles, caulk for ceiling-to-hatch frame seal, insulation	Demolition and/or framing from a new hatch, new ceiling trim and stop	
Crawl space or knee wall access door (a required part of the larger air sealing ECM, sealing the access opening with a rigid door weatherstripping)	Hinges, latches, insulation	Demolition of deteriorated existing frame, new framing, new trim and stop	
Caulking, weatherstripping existing windows (done as part of the larger air sealing ECM)	Backer rod, cleaning off old caulk	Primer or sealer, replacing deteriorated framing, other prep repair	
Vinyl replacement windows for double hung sashes	Fasteners, interior and exterior caulk materials & labor	Replace broken stops, replace or repair rotted jambs and wall framing	
Replacement or repair of heating/cooling systems	All typical accessories for proper installation	Flue repair, providing combustion air from outside the CAZ as needed	All, including flue repair and combustion air from outside CAZ as needed, if the system is inoperable
Heating/cooling system replacement	Include all associated costs within replacement costs	Construction of separate CAZ per code requirement	Include all associated costs if SIR disqualifies as ECM
CFL or LED		Replace hazardous light socket or fixture	Replace hazardous light socket or fixture

d. NAM—Non Audited Measure

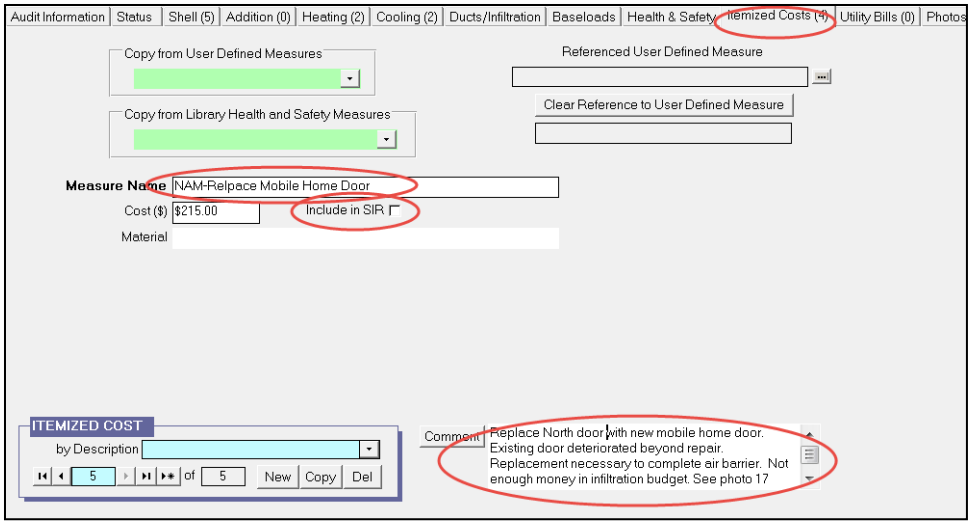
i. A Non Audited Measure is an allowable measure that does not require an SIR of 1 to be installed (see Guidelines Section B8). Typically NAM's are allowable because the job qualifies for use of other funding and the measure meets specific requirements.

ii. **DOE funding cannot be used to pay for a NAM.**

iii. If a measure is an Allowable Weatherization Measure (per section B8), it should first be evaluated to see if it qualifies as an ECM before considering it as an NAM.

iv. NAM's should be entered as an Itemized Cost so they appear on the input report under the Additional Measures section. The box next to "Include in SIR" must be un-checked so the measure costs will not be included in the cumulative SIR.

v. Whenever possible, NAM's should be identified as an "NAM" in the title of the measure, and the comments section must indicate why the measure is allowable without an SIR. See example below:



vi. DOE funds cannot be used to address incidental repair or health and safety issues caused by or related to the installation of a NAM. ***If a NAM has related health or safety costs, or incidental repair costs, these costs must be included in the cost of the NAM.***

e. User Defined Measures

IRM's, HSM's, and NAM's can also be created as User Defined Measures in the Setup Library. In addition to the other setup rules listed above, the Energy Savings field should be set to "No Energy Savings."

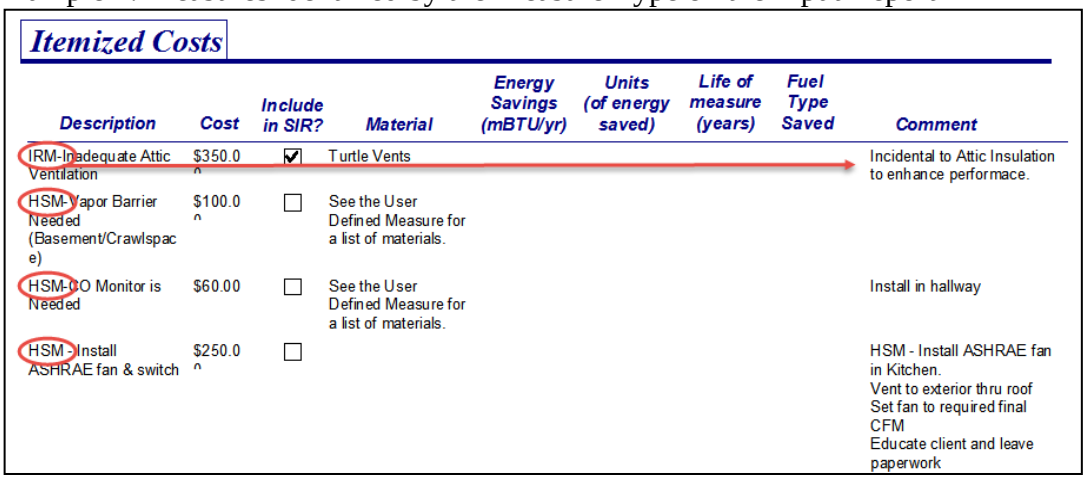
6. Identifying Measures on the Audit

a. Identifying a Measure by Type on Audit: Since the audit is the tool we use to document and justify every measure we install on a dwelling, it is important that every measure shall be identified on the audit as one of the four measure types. Identifying the measure type completes the justification process of an ECM and an HSM, and partially completes the justification process for an IRM and a NAM. Each Measure is to be identified by type and meet the additional justification requirements listed in Table 1.

Table 1. How to Identify and Justify a Measure on the Audit

	ECM Energy Conservation Measure	HSM Health & Safety Measure	IRM Incidental Repair Measure	NAM Non-Audited Measure
How to Identify Measure Type on Audit	ECM's appear on Recommended Measures Report with a measure SIR of 1 or greater	Listed as an itemized cost with "HSM" written in front of the measure name	Listed as an itemized cost with "IRM" written in front of the measure name	Listed as an itemized cost with "NAM" written in front of the name, OR a manditory Heating or Cooling Measure with "NAM" written in front of the System Code.
Additional Justification Required	None	None as long as its an approved HSM.	Yes-Must document the ECM(s) the IRM is incidental to; and describe how it Protects or Enhances ECM	Yes-Must document why NAM is allowable without an SIR

Example 1: Measures identified by the Measure Type on the Input Report



Itemized Costs

Description	Cost	Include in SIR?	Material	Energy Savings (mBTU/yr)	Units (of energy saved)	Life of measure (years)	Fuel Type Saved	Comment
IRM-Inadequate Attic Ventilation	$350.0 0	☑	Turtle Vents					Incidental to Attic Insulation to enhance performace.
HSM-Vapor Barrier Needed (Basement/Crawlspace)	$100.0 0	☐	See the User Defined Measure for a list of materials.					
HSM-CO Monitor is Needed	$60.00	☐	See the User Defined Measure for a list of materials.					Install in hallway
HSM - Install ASHRAE fan & switch	$250.0 0	☐						HSM - Install ASHRAE fan in Kitchen. Vent to exterior thru roof Set fan to required final CFM Educate client and leave paperwork

7. Standard File Formatting

a. Completed audits shall be organized in a standardized format to create uniformity across all agency files, to help agencies determine if the file is complete, and to aid in reviewing of electronic files. Audit files shall be organized into the following sub-sections:

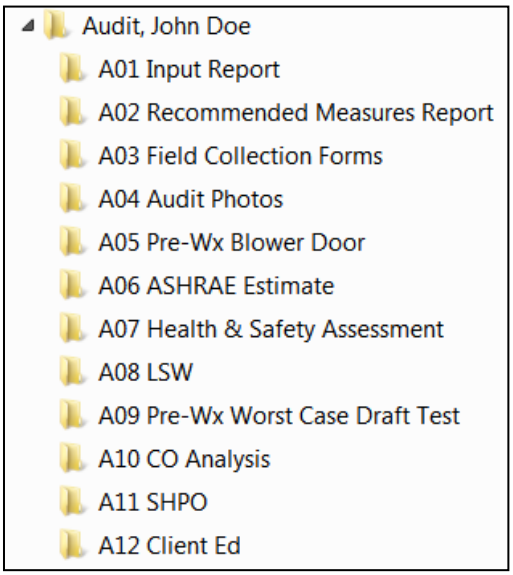
- A01 Input Report
- A02 Recommended Measures Report
- A03 Field Collection Forms
- A04 Audit Photos
- A05 Pre-Wx Blower Door
- A06 ASHRAE Estimate

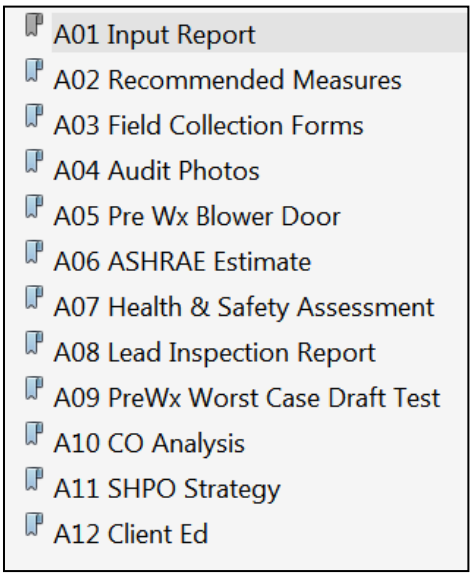
- A07 Health & Safety Assessment
- A08 LSW Strategy & Testing
- A09 Pre-Wx Worst Case Draft Test
- A10 CO Analysis
- A11 SHPO Strategy & Docs
- A12 Client Ed

i. Paper File Systems—If the audit is stored at the agency as a paper file, the completed audit should be arranged in the order listed above with a tab or a page divider indicating where each sub-section of the audit begins.

ii. Electronic File Systems—If the audit is stored at the agency as an electronic file, the sub-sections should be used to organize the audit. If the Audit contains multiple files and file formats, a Library should be created with a folder for each sub-section listed above. If the entire audit is saved as a Single Document such as a pdf, the file should be bookmarked or should include a table of contents (preferably hyperlinked) indicating the beginning of each subsection. See examples below.

Example 2: Left, Library Approach (folder for each sub-section), or Right, Single Document Approach (bookmarks for each sub-section)





8. Standard Audit Settings and Methods

a. Audit Information

the following information should be used to determine which selections should be made on the Audit Information Tab:

i. Setup Library—Select the library that was effective on the work-start date (the date the on-site audit was started). Auditors should ensure the setup library complies with all settings listed herein.
ii. Fuel Cost Library—Select the library that was effective on the work-start date. See section B9.2.b.viii
iii. Supply Library—Select the library that was effective on the work-start date.
iv. Weather File—See section B9.2.b.x

b. Shell

i. The Shell tab and its respective sub-tabs should be used to enter all aspects of the thermal boundary so the audit can accurately evaluate dwelling energy loads, and determine which opportunities to improve the thermal boundary will be cost effective.
ii. **Thermal Boundary Strategy:** Auditors are required to formulate a cost-effective strategy to complete the thermal boundary, and to use the audit to evaluate each aspect of the strategy.
    a. Only those aspects with an SIR of 1 or greater shall be installed.
    b. Each audit must contain a written strategy for completing the thermal boundary. On most homes this can be documented using the "Shell" sections of the NEAT/MHEA audit.
    c. More complex single-family homes, and multi-family homes may require diagrams to document the strategy. A diagram is recommended on all homes as a best practice.

c. Walls

i. Information about each wall on the thermal boundary of a dwelling should be gathered and input into the audit. *This excludes walls associated with a foundation, or a finished or unfinished attic.*
ii. Inputs should accurately reflect the building type, orientation, surface area and existing insulation type and thickness.
iii. Whenever possible the audit should determine if wall insulation will be added
iv. Auditors should select the most cost effective insulation type to be added
v. If the wall cavity is already filled with insulation, and it is not feasible to install additional inslulation, Auditors can select "None" for the Added Insulation Type and should note the condition in the comment section.
vi. If there is no wall cavity, and the interior side of the wall is finished, Auditors can select "None" for the Added Insulation Type and should note the condition in the comment section.

d. Windows

i. Information about each window on the thermal boundary of a dwelling should be gathered and input into the audit.
ii. Each window should be set to "evaluate all" to ensure the window is evaluated for both weatherization and replacement with a Low-E window unless excluded in iii., or iv. below.
iii. All windows on the thermal boundary must be evaluated for replacement on the audit unless they are:
    a. in a bedroom which does not have a window that meets egress,
    b. or they are double paned low-e windows in excellent condition.
iv. All windows on the thermal boundary must be evaluated for weatherization or air sealing on the audit unless they are:
    a. in excellent operating condition and there are no opportunities to air seal the window.
v. **Basement Windows:** on the thermal boundary should be evaluated on the audit. To evaluate auditor should create an additional wall with a surface area 2 to 5 feet larger than the total surface area of all of the basement windows. Label the wall "BSMT Windows". Orient the wall to the direction with the majority of the basement windows. And assign all the basement windows to that wall.
vi. **Egress:** When none of the windows in a bedroom meets egress, the window(s) in that room cannot be replaced by weatherization. Auditors should still evaluate the window(s) to be sealed or weatherized by choosing Weatherize in the retrofit options field. And it should be noted in the comment field that the windows in that room do not meet egress.
vii. **LSW for Windows:** the cost of Lead Safe Weatherization for windows should never be included in the window ECM. When LSW is required, it should be included on the audit as one HSM for all the Windows requiring LSW. If a window is being replaced as a NAM, the cost of LSW for that window should be included in the NAM.
viii. **Methods for evaluating windows:** There are two methods for estimating window cost. By Square foot (NEAT) and United Inch (MHEA), or by inputting the Actual Cost of each window.

    a. SqFt/United Inch: Calculate the agencies average cost per SqFt for the NEAT and United Inch for the MHEA and enter these into the Setup Library under Costs on the Library Measures tab. List the typical Labor and Other costs respectively. If the Additional costs field is used to adjust the cost of any windows, an explanation must be provided in the comment section.

    b. Actual Cost: In the Setup Library, under Costs on the Library Measures tab, leave the Windows and Labor costs at zero, and set the other cost to include the average cost of labor and ancillary items (typically $50). Then use the Additional Costs field for each window on the audit to include the actual cost of the window. If the Actual Cost method is used an explanation in the comment section is not required. *This is one of the few times an explanation is not required for additional costs listed.

e. Doors

Information about each door on the thermal boundry of a dwelling should be gathered and input into the audit. All doors on the thermal boundry must be evaluated for replacement on NEAT audits by including the door type, condition, and leakiness.

i. **MHEA Doors:** Since the MHEA does not have a way to evaluate for the replacement of a mobile home door as an ECM based on its leakiness or condition, the door measures should be turned off in the MHEA Setup Library. Mobile home doors can only be replaced as an ECM if they are included in the infiltration reduction measure, or they can be replaced as a NAM using other funding sources where applicable.
ii. **LSW for Doors:** the cost of Lead Safe Weatherization for doors should never be included in the door ECM. When LSW is required, it should be included on the audit as an HSM. If a door is being replaced as a NAM, the cost of LSW for that door should be included in the NAM.
iii. **Replacing Doors with Glass:** The goal of replacing a door is to increase the thermal resistance and air tightness of that door. If an existing door on the thermal boundry has glass in it, the auditor can evaluate to replace the door with a more energy efficient door with glass similar to the existing door. The glass in the replacement door must be double paned, Low-e glass and the door must audit with an SIR of 1 or greater. If a door with similar glass does not have the required SIR, the audit should be re-run with a replacement door without glass. If a replacement door has glass in it, a photo of the existing door must be included in A04 audit photos.
iv. If a client refuses the replacement of a door on the thermal boundry, the auditor should evaluate the situation to determine if the declined measure is allowable and should document the situation accordingly *(see guidelines B9.3.a.iii Delcined Measure)*.
v. Sliding glass doors should be evaluated as windows on the Windows tab

f. Attics

Information about all attics that are part of the thermal boundry shall be gathered and input into the audit. When there are multiple attics, or attics of differing types or materials, auditors should create multiple attics and evaluate each to complete the thermal boundary.

i. The auditor shall identify the existing insulation type(s) and depth(s).
ii. Wherever possible the Audit shall determine how much attic insulation shall be added. Auditors should select the added insulation Measure and Type, but should not enter anything in the Added R Value or Max Depth fields. These fields should be left blank whenever possible so the audit will determine how much insulation to add.
iii. If there is more than one type of existing insulation, the type that best represents the majority of the existing insulation shall be selected, and the depth shall be the combined depth of each type of insulation

iv. If there are large sections of an attic (> 30sq ft) where the insulation type or the average depth differs substantially from another, each section should be entered into the audit as a separate attic.

v. As a best practice, dwellings with finished attics, or mulitiple attics should include a diagraham showing each attic listed on the audit

g. Foundations

Information about all foundations that are part of the thermal boundry shall be gathered and input into the audit. Where there are multiple foundations, or foundations of differing types or materials, auditors should create multiple foundations and evaluate each to complete the thermal boundary. When evaluating foundations, the goal is to choose the strategy that will allow you to complete the thermal and air boundary as much as possible, or the strategy that provides maximum allowable completion.

i. The auditor shall identify the existing insulation type(s) on the audit

ii. The auditor shall determine the best location of the foundation thermal and air boundary.

iii. Utah Field Guide Tables 6-1, and 6-2 shall be used to help determine weather the best location of foundation thermal and air boundary should be at the wall or the floor.

iv. As a best practice, zonal pressure diagnostics should be used to help determine weather the best location of foundation thermal and air boundary should be at the wall or the floor.

v. The air sealing, or infiltration reduction strategy must align with the thermal boundry strategy selected

vi. When the thermal strategy is evaluated, if the NEAT/MHEA leaves a substantial portion of the thermal and/or air boundary incomplete, the auditor must provide additional documentation to show how the strategy selected provides maximum allowable completion.

vii. Whenever possible, the Audit tool should determine how much insulation shall be added.

viii. As a best practice, dwellings with multiple foundations should include a diagraham documenting each foundation listed in the audit.

h. Appliance Specs (HVAC, Water Heater, Refrigerator)

Wherever possible the manufacturer's specifications for the appliance inputs, outputs, efficiency, consumption, etc. shall be used in the energy audit. If his data cannot be found on the nameplate of the appliance, in the Preston's Guide, or the manufacturer's website, auditors must document how the Specifications were derived in the comment section for the appliance.

i. The Shipped from Factory ratings should be used whenever possible.

ii. The altitude deration rating should not be used.

iii. For Furnaces: If the Manufacturer's efficiency rating cannot be determined, the following methods can be used and must be documented in the comments section:

The Output capacity can be determined using the following equation:
# of burners x 20,000 x efficiency = Output capacity

Example: 3 burners x 20,000= 60,000 x 80% efficiency =48,000 BTUH

Combustion analysis can be performed to determine Steady State Efficiency.

Note: any Natural draft furnace will be 60% to 70%
Cat 1 furnace will be 80% to 89%
Any furnace with PVC flues will be over 90%

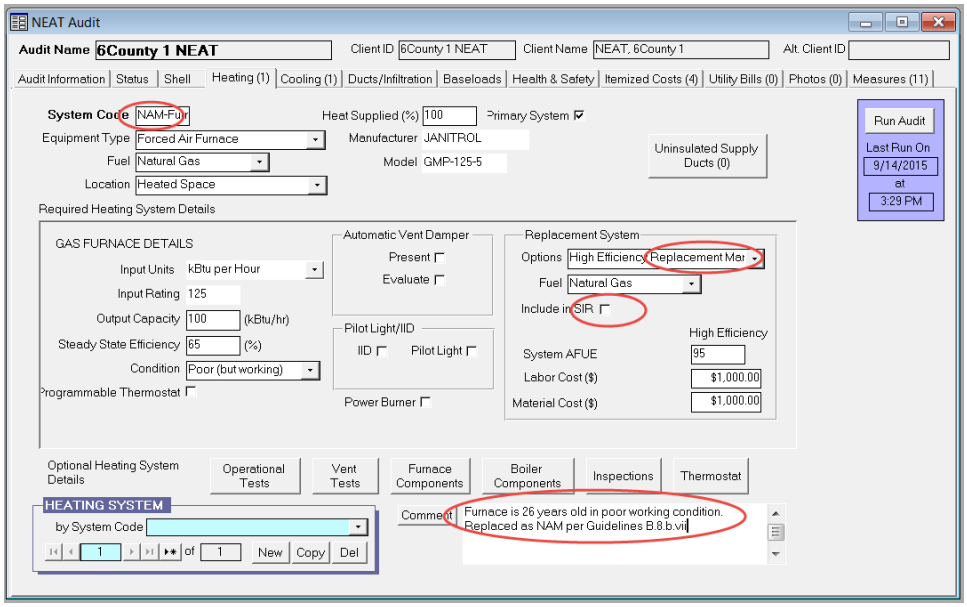
i. Heating

Information about each heating system on a dwelling should be gathered and input into the audit. The Heating tab of the audit must represent the type of heating system which will be in operation ***post-weatherization*** regardless of whether the heating system will be replaced as an ECM, an NAM, or not at all. This will ensure the SIR of all measures tied to the heat load is properly calculated since the heat load is determined by the post-weatherization furnace.

i. Heating Replacement as an ECM: To properly evaluate a dwelling, the existing heating system must be listed, along with a reasonable replacement option. The replacement option selected must be an active and allowable measure. The replacement info must be entered regardless of the age or condition of the existing heating system. If the existing system is a brand new 96% efficient furnace, auditors still need to enter in a replacement to show that replacing the furnace will not have a payback.

ii. Heating Replacement as an NAM: The replacement system should always be audited first using the "Evaluate All" option to see if the furnace can be replaced as an ECM--(except for fuel conversions). If a Heating system replacement does not have an SIR of One or greater, and it is determined that it is necessary to replace the system based on other reasons per Guidelines Section B, then the Heating system should be replaced as a NAM. To do this, the auditor should:

a. select the appropriate mandatory Replacement System Option in the Replacement System Options field. *Note: This is one instance where it is permissible to select "replacement mandatory" from the measure options.*
b. leave the Include in SIR box Un-checked.
c. Change the name of the System Code to "NAM" or "NAM-- plus the system code the agency prefers to use".
d. Document the reason for replacing the heating system as a NAM.
See Example below:



iii. Fuel Conversion (NAM): The NEAT audit is not designed to evaluate for fuel conversions. A Fuel Conversion will be treated as a NAM. DOE funds will never be used to pay for a Fuel Conversion. If a fuel conversion is to be done on the home, the auditor must use *Attachment 7: Fuel Conversion calculator* to show a savings-to-investment ratio of 1 or greater. Since the NEAT Audit limits the replacement options to only those heating systems that will work with the primary heating fuel, auditors will have to work around the audit by selecting an existing furnace type similar to the type of furnace to be installed, which will allow the appropriate Replacement system to be selected. Then use the comments field to document what the actual existing heat source is, and that a fuel conversion is allowable. This work-around is not necessary in the MHEA except when the Fuel for the existing Equipment is Wood or Coal.

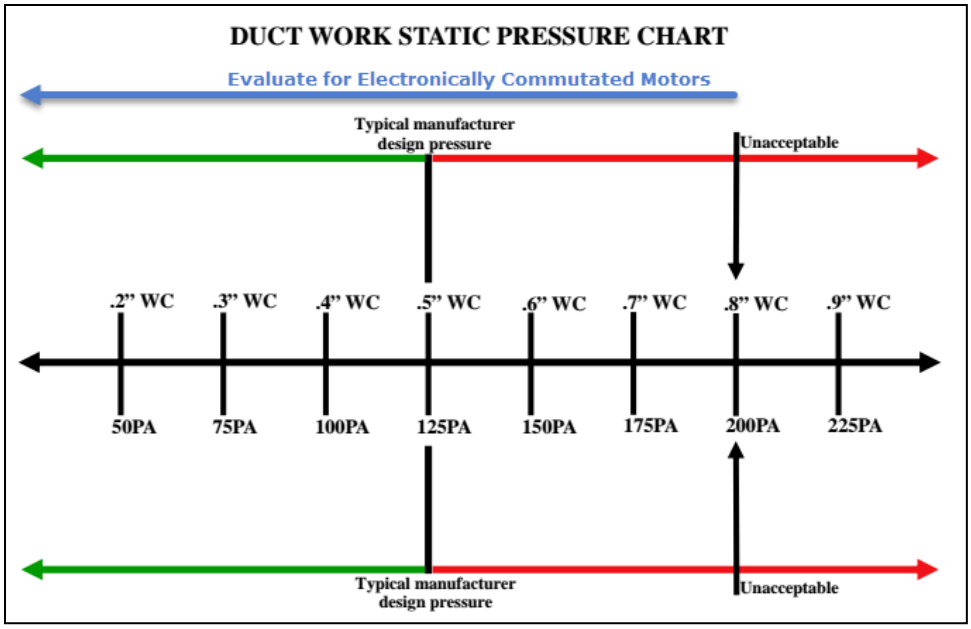
iv. Electronically Commutated Motors

a. A user defined ECM should be created for Electronically Commutated Motors. *See Section B9.b.vii Approved User Defined Measures.*

b. All Furnaces with standard PSC motors should be evaluated for installation of an Electronically Commutated Motor anytime the total External Static Pressure (ESP) is below .8" water column (WC). If ESP is higher than .8" WC then an Electronically Commutated Motor should never be installed. *See chart below.*

c. A 4" media box should be installed whenever possible in conjunction with the new motor, and should be audited as an IRM incidental to the Electronically Commutated Motor.

d. Learn More: Here's a good video about measuring External Static Pressure:



v. Fireplace as the Primary Heat Source:

a. If a fireplace is the primary source of heat for a dwelling, the following imputs should be used.

Input Units: Lbs per hour
Input Rating: 8
Output Capacity: 32 kBTU/hr
Steady State Efficiency: 50%

b. If the fireplace is the primary source of heat, a blower door must be used to simulate a fire as part of the Worst Case Draft test.

c. In homes where the fireplace is not the primary source of heat, it is not necessary to simulate a fire as part of the Worst Case Draft test. If there is a natural draft appliance in the home, it should be noted on the Health & Safety Assessment that using the fireplace could cause the appliance to backdraft. Appropriate Client education should be administered, and signed for by the client.

vi. Duct Insulation

All uninsulated duct located outside the thermal envelope should be evaluated to be insulated using the NEAT audit, and should always be insulated when using the MHEA audit.

a. MHEA: Since there is not a way to evaluate duct to be insulated using the MHEA, all un-insulated duct located outside the thermal envelope shall be insulated as part of a belly or attic Insulation measure, or as a NAM.

b. NEAT: All uninsulated supply and return ducts should be evaluated using the "Uninsulated Supply Ducts" section of the heating tab, even though the button label in the audit says, "Uninsulated Supply Ducts".

c. NEAT: If more than three uninsulated duct sizes are present, similar duct sizes should be combined so that all uninsulated duct will be represented in the three spaces provided in the audit.
d. NEAT: Duct can be combined by averaging the size to represent the total surface area of the uninsulated duct (i.e. 10' of 6" round duct and 10' of 8" round duct can be combined and listed as 20' of 7" round duct).
e. NEAT: Since only one location can be selected, Attic or Subspace, the location with the majority of the uninsulated duct should be chosen.
f. Uninsulated Duct for Evaporative Cooler(s) and other secondary HVAC systems which will be operable Post-Weatherization should be evaluated to be insulated using NEAT, and should be insulated using MHEA.
g. Uninsulated duct in a crawl-space that is inside the thermal envelope (or will be post-Wx) can be evaluated to be insulated (NEAT) and can be insulated as a NAM using the MHEA; but is not required to be.

j. Cooling

Information about each cooling system on a dwelling should be gathered and input into the audit. The Cooling tab of the audit must represent the type of cooling system which will be in operation post-weatherization regardless of whether the cooling system will be replaced as an ECM, an NAM, or not at all. This will ensure the SIR of all measures tied to the cooling load is properly calculated since the cooling load is determined by the post-weatherization equipment.

i. See *Attachment 32: Cooling Equipment Policy* for further Guidance.
ii. If an air conditioner is to be replaced because it will no longer function with the heating system that is to be replaced as a NAM—Fuel Conversion, the cost of the Air Conditioner shall be included when calculating the SIR for the cost of the fuel conversion.

k. Ducts/Infiltration

i. **Infiltration Reduction Strategy:** Each audit must contain a written strategy for reducing air infiltration at the thermal boundary by 30% to 50%. The Air sealing strategy should align with the thermal boundary strategy. On most homes this can be documented in the comments section of the "Ducts/Infiltration" tab of the NEAT/MHEA audit. More complex single-family and multi-family homes may require diagrams to document the strategy. A diagram is recommended on all homes as a best practice.
ii. Auditors are required to:
    a. Measure and document the total leakage of the home using a blower door and the TecTite software.
    b. Use blower door and other methods listed in Utah Field Guide Chapter 12 to identify air-sealing opportunities

c. Air-sealing opportunities should be prioritized in the following order:
    i. Duct leakage to the outside—if included in Infiltration Reduction. (Highest Priority)
    ii. Opportunities that can be addressed in conjunction with the thermal boundry strategy
    iii. Between the conditioned space and the attic
    iv. Between the conditioned space and attached garage
    v. Between the conditioned space and the basement or crawl space
    vi. Between the conditioned space and outside (Lowest Priority)

d. Use the audit tool to determine the total budget for infiltration reduction by adjusting the cost of the measure to get it to an SIR of 1.
e. Formulate a cost-effective strategy to reduce air infiltration, based on the prioritization of the air-sealing opportunities and the budget of the measure.
f. Document the strategy in the comments section of the Ducts/Infiltration tab.
g. Wherever possible, Air infiltration reduction efforts should be entered into the Ducts/Infiltration section of the audit. This allows the audit to appropriately account for the energy savings of reducing air infiltration.

    Example: if the cost of air sealing an attic is included in the cost of the attic insulation measure, it reduces the real SIR of that measure, and could cause the SIR of the insulation measure to drop below a 1. The air infiltration costs should be accounted for on the Ducts/Infiltration tab.

iii. **Duct Sealing**

As a best practice Duct Leakage to the outside should be measured and evaluated for reduction on all homes with duct work outside the Conditioned Space.

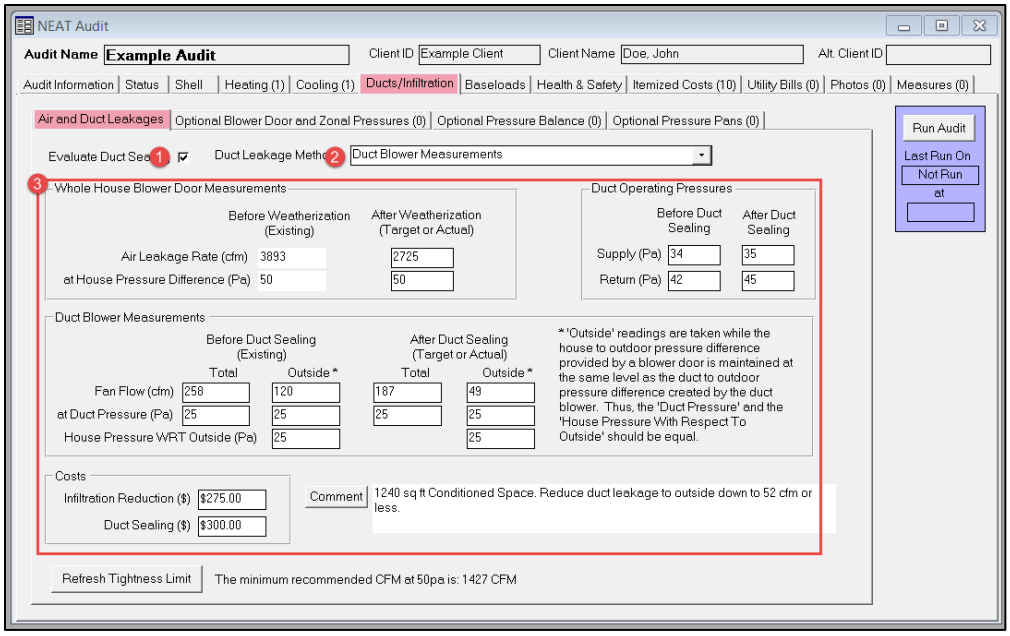
a. The goal is to achieve a 50% reduction in leakage to the outside. If the goal cannot be achieved, an explanation should be documented on the audit or in the production notes.
b. Duct Sealing and Infiltration Reduction should be evaluated as **separate** measures. The additional duct leakage information allows the audit to more accurately calculate energy savings, and generally allows for a greater investment in the two measures.
    i. Duct Leakage Method for a NEAT audit should always be Duct Blower Measurements.
    ii. Duct Leakage Method for a MHEA audit can be either Duct Blower Measurements, or Pressure Pan
c. If duct leakage is included in the air-infiltration measure, it shall be given highest priority in the air-sealing strategy.
d. Duct Leakage in a crawl-space should be considered leakage to the outside, regardless of whether the crawl is inside or outside the envelope post-Wx.
e. Duct Leakage in a CAZ can be addressed as a Health & Safety measure when the CAZ exceeds BPI's CAZ depressurization limits during WCD Testing.

BPI CAZ Depressurization Limits

Venting Condition	Limit (Pascals)
Orphan natural draft water heater (including outside chimneys)	-2
Natural draft boiler or furnace commonly vented with water heater	-3
Natural draft boiler or furnace with damper commonly vented with water heater	-5
Individual natural draft boiler, furnace or domestic hot water heater	-5
Mechanically-assisted boiler or furnace commonly vented with water heater	-5
Mechanically-assisted boiler or furnace alone, or fan-assisted DHW alone	-15
Chimney-top draft inducer (Exhausto-type or equivalent); High static pressure flame retention head oil burner; Direct-vented appliances/Sealed combustion appliances	-50

iv. **Duct Leakage Testing**

a. Duct Leakage Testing should be conducted on all dwellings with ducts outside the conditioned space. Testing is not necessary on duct systems that only serve an Evaporative Cooler see Section B9. 7. vi.
b. As a Best Practice, auditors should measure duct leakage and use the audit to evaluate the energy savings of sealing the ducts separate from other Air Infiltration Reduction costs. There are two approved methods for measuring Duct Leakage: Duct Blower Measurements Method for NEAT and MHEA, or Pressure Pan Measurements Method for MHEA only.
c. Duct Blower Measurements Method:
   Energy savings should be evaluated in the NEAT audit tool by:
   i. Checking, “Evaluate Duct Sealing”, on the Ducts-Infiltration/Air and Duct Leakages tab as shown in red below
   ii. Selecting the Duct Leakage Method, “Duct Blower Measurements” from the dropdown menu
   iii. Filling in all of the required fields appropriately.



d. Static Pressure, total duct leakage, and a duct Leakage to outside test results must be conducted on the dwelling to evaluate the duct sealing.

v. **Using the MHEA to evaluate Duct Sealing:**

There are two approved methods to evaluate Duct Sealing in an Manufactured Home. Either the Duct Blower Measurements method (above) or the Pressure Pan average.

a. No Ducts Outside the Conditioned Space: It is not necessary to conduct Duct Leakage Tests if all ducts are inside the conditioned space. If this is the case, leave the Evaluate Duct Sealing box unchecked and note in the comments "All Ducts are inside envelope."
b. Evaporative Cooler Ducts: Duct Leakage Testing is not required on duct systems that only serve an Evaporative cooler. Evaporative cooler duct outside the envelope should be evaluated for air sealing and insulation. Ducts should be evaluated for air sealing by including the cost in the Ducts-Infiltration/Air and Duct Leakages/Infiltration Reduction field, and should be evaluated for insulation by listing any uninsulated duct on the Heating Tab/UnInsulated Supply Duct fields.

l. Baseloads

Information about each baseload system on a dwelling should be gathered and input into the audit.

i. Water Heating
   a. The existing equipment should always be listed to allow audit to evaluate for showerheads and baseload costs.

b. All Showerheads should be evaluated for replacement. Auditors should use a bucket and a stopwatch to measure the flow of each showerhead, should consult with the client to approximate the time the showers are in use each day, and educate the client on the potential savings associated with replacing with low flow. If the client refuses to have a showerhead replaced, the showerhead should be removed from the evaluation, and the flow, usage, and reason for refusal should be noted in the comments section of the audit. This refusal shall not be treated as measure skipping.

ii. Refrigerators
   a. If the Existing equipment is listed in the NEAT/MHEA refrigerator database, the consumption information can be used to evaluate the SIR of a replacement fridge. Auditor must click on the Refresh button after all Existing and Replacement fields have been entered to adjust consumption to current conditions.
   b. If the existing equipment is not listed, the agency should measure the consumption with a meter to determine the SIR of a replacement.
   c. Auditors can use metered consumption on homes that are listed in the database if they are concerned that the listed consumption is not an accurate representation of actual consumption.
   d. If a client refuses a refrigerator replacement the replacement, the auditor should evaluate the situation to determine if the declined measure is allowable or legitimate *(see guidelines B9.3.a.iii Delcined Measure)*. If it is declined for a legitimate reason, the replacement refrigerator info shall be removed from the evaluation, the reason for the declined measure shall be noted in the comments section of the audit.

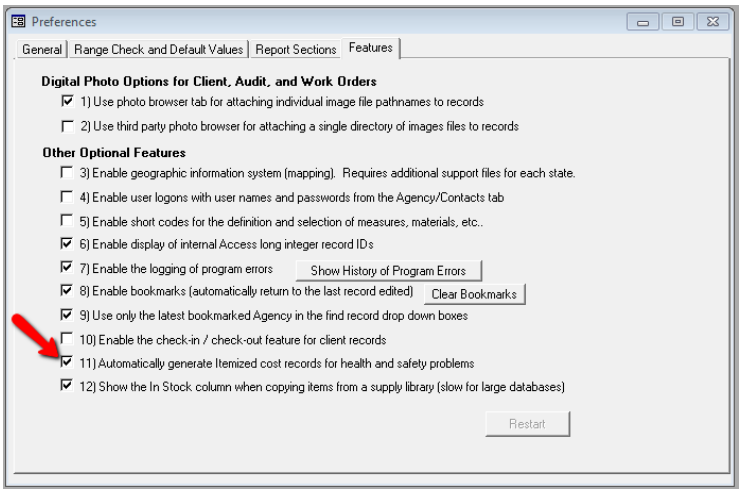
iii. Lighting Systems
   a. All incandescent bulbs in use for 1 hour or more each day, should be evaluated for replacement.
   b. Incandecent Bulbs in Vanities, Flood Lights, and fixtures candelabra and other non-standard sized bulbs should be evaluated for replacement with similar LED bulb(s)
   c. Incandescent Can lighting should be evaluated for replacement with LED Retrofit Can Lights. Air-tight LED retrofit can lights could also be considered for installation as part of an air-sealing measure.
   d. LED light bulbs should be used wherever possible
   e. When an LED bulb is cost prohibitive, a CFL should be considered
   f. LED bulbs must be Energy Star rated
   g. Agencies should use current stock of CFL bulbs before purchasing LED's

m. Health & Safety

A Health & Safety measure should be created on the itemized costs tab for every Health & Safety item identified as the agency's responsibility on the Health & Safety evaluation.

i. The cost of Health & Safety measures should be accurate estimates of the actual cost.
ii. The Health & Safety measures the Other Optional Feature #11 should be active in order to have selections on the Health & Safety tab create an itemized costs for the measure.

**Other Optional Feature #11 should turned on, or be selected under Audit Preferences so items selected on the Health & Safety tab will appear as Itemized Costs.*



n. Itemized Costs

Since the audit must list every measure which will be performed on an audit, the itemized cost tab shall be used to create all HSM's, IRM's and NAM's (except for HVAC Replacements) which will be conducted on the home. Follow the instructions under the associated measure type to create these measures.

1) **Immediate Disclosure of Emergency conditions**
2) **Establish Client Relations (See SF EA Pres p.11)**
    a. **H&S Concerns**
    b. **Energy Savings potential**
3) **Collect Appliance Info and Electrical Baseload Audit (SF p.11)**
4) **Look at allowing Fuel Switching with DHS money with state approval. Need to investigate if we may use DOE funds at all on the home or if no DOE funds can be used when fuel switching.**