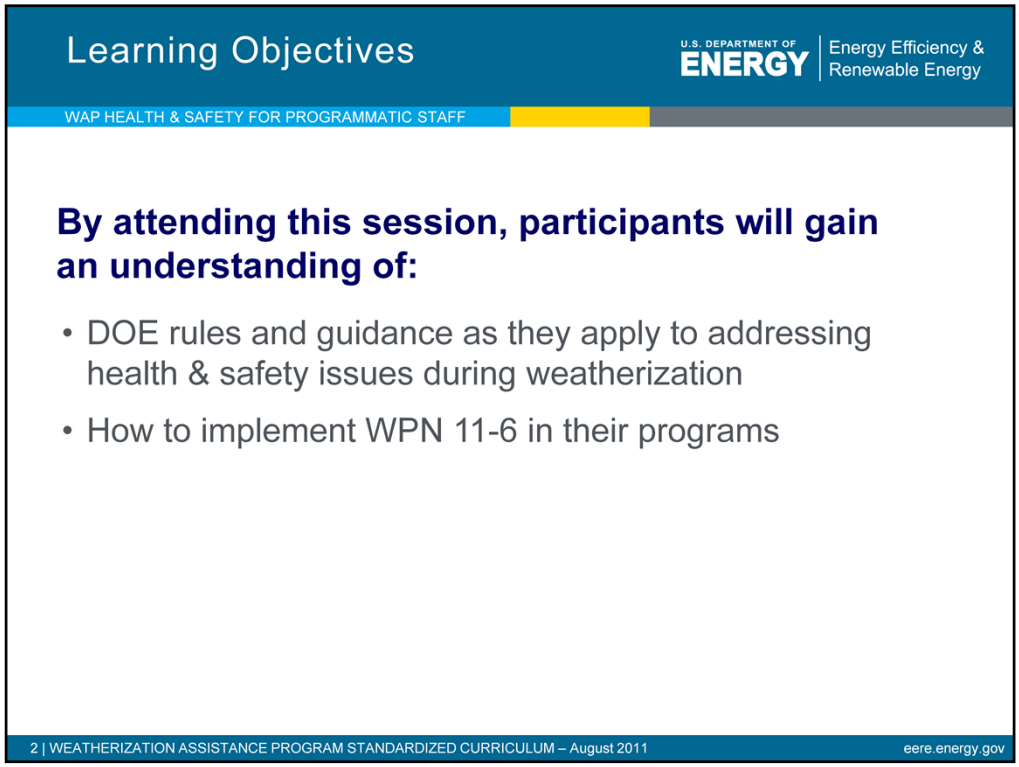
PROGRAMMATIC STAFF

WAP Health & Safety



This session will identify DOE rules and guidance as they apply to addressing health & safety issues during weatherization.

This training also allows time for attendees to fill out the Health and Safety Plan template, included in the packet of materials with this presentation.

Addressing Health & Safety in WAP

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

WAP is primarily an energy efficiency program.

Health & Safety measures must meet criteria:

(1) Elimination of hazards is necessary before, or as a result of, the installation of weatherization materials; and

(2) H&S spending is limited (expressed as a percent of average dwelling unit costs), and the limit is reasonable in light of the primary energy conservation purpose of the Weatherization Assistance Program.

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When considering what activities make sense as a health and safety expense, consider these two questions:

1. What must we do within reasonable costs to get the home to a point where we can go forward with weatherizing, where the weatherization work will be lasting and effective?

2. What must we do to ensure that the weatherization work we conducted does not create a health or safety problem for the occupant?

Overview of WPN 11-6

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- Drafted in 2011 to put all relevant H&S guidance in one place.
- Describes most common issues encountered during weatherization, what is allowed, what is required, and what is prohibited in terms of dealing with these issues.
- Outlines how grantees must address H&S in their grantee plan, and where more guidance may be needed at the local level.

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Weatherization Program Notice (WPN) 11-6 describes the most common issues encountered during weatherization - what is allowed, what is required, and what is restricted.

The guidance also outlines how grantees must address H&S in their grantee plan, and allows for or at times requires additional direction to be passed down to the local level. The grantee's H&S plan is meant to be the enforceable implementation document of 11-6 for their local programs and should take care to include all of the relevant information from 11-6.

This presentation covers WPN 11-6 in detail, but it is not intended to provide full training on each of the issues outlined in the guidance. For example, we will discuss how mold and moisture must be addressed in the plan, but will not go into detail about how to identify and mitigate moisture issues. The intended audience for this presentation is program directors and others involved in drafting program policy and the grantee health and safety plans. This presentation will also be useful for those implementing or enforcing weatherization H&S guidance.

Implementing 11-6 in the Plan

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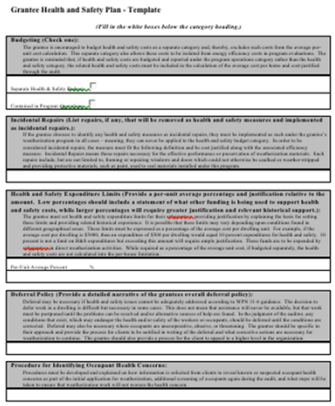
- Budget
- Identify measures
- Set per unit spending limits
- Deferral policy
- Occupant health concerns
- Identify hazards and approaches
- Training/testing
- And more…



Grantee Health and Safety Plan - Template

(Fill in the white boxes below the category heading.)

Budgeting (Check one):

The grantee is encouraged to budget health and safety costs as a separate category and, thereby, exclude such costs from the average per-home cost calculation. Only separate category also allows these costs to be excluded from energy efficiency costs in program evaluations. The grantee is reminded that, if health and safety costs are budgeted and reported under the program operations category rather than the health and safety category, the related health and safety costs must be included in the calculation of the average cost per home and cost justified through the audit.

Separate Health & Safety: Yes/No/N/A

Contained in Program: Yes/No/N/A

Incidental Repairs (List repairs, if any, that will be removed as health and safety measures and implemented as incidental repairs.):

If the grantee chooses to identify any health and safety measures as incidental repairs, they must be implemented as such under the grantee's weatherization program in all cases – meaning, they can never be applied to the health and safety budget category. In order to be considered incidental repairs, the measures must fit the following definition and be cost justified along with the associated efficiency measures. Incidental Repairs means those repairs necessary for the effective performance or preservation of weatherization materials. Such repairs include, but are not limited to, fixing or repairing windows and doors which could not otherwise be caulked or weather-stripped and providing protective materials, such as paint, caulks and sealants, installed under the program.

Health and Safety Expenditure Limits (Provide a per-unit average percentage and justification relative to the amount. Low percentages should include a statement of what other funding is being used to support health and safety costs, while larger percentages will require greater justification and relevant historical support.):

The grantee must set health and safety expenditure limits for their organization, providing justification by explaining the basis for setting these limits and providing related historical experience. It is possible that these limits may vary depending upon conditions found in different geographical areas. These limits must be expressed as a percentage of the average cost per dwelling unit. For example, if the average cost per dwelling unit is $4,000 and the limit is set at 10 percent, the limit would be $400 per dwelling unit. Although 10 percent is not a limit on H&S expenditures but exceeding that amount will require ample justification. These limits are to be expended by organizations on direct weatherization activities. While required as a percentage of the average unit cost, if budgeted separately, the health and safety costs are not calculated into the per-home limitation.

Per Unit Average Percent: %

Deferral Policy (Provide a detailed narrative of the grantees overall deferral policy):

Deferral may be necessary if health and safety issues cannot be adequately addressed according to WPN 11-6 guidance. The decision to defer work is a dwelling is difficult but necessary in some cases. This does not mean that assistance is/forever be available, but that work must be postponed until the problems can be resolved and/or alternative sources of help are found. In the judgment of the auditor, any dwelling unit where the health and safety problems are so severe that the dwelling unit is not fit for human habitation should be considered. Deferral may also be necessary where occupants are uncooperative, abusive, or threatening. The grantee should be specific in their approach and provide the process for clients to be notified in writing of the deferral and what corrective actions are necessary for weatherization to continue. The grantee should also provide a process for the client to appeal to a higher level in the organization.

Procedure for Identifying Occupant Health Concerns:

Procedures must be developed and explained on how information is solicited from clients in crisis/known or suspected occupant health concerns as part of the initial application for weatherization, additional screening of occupants again during the audit, and what steps will be taken to ensure that weatherization work will not worsen the health concern.

The Health & Safety Plan Instructions and Template (Template), included, walks you through the development of an updated H&S plan that covers all relevant issues. This graphic will be used as an icon with the appropriate page number in the Template where each issue is addressed.

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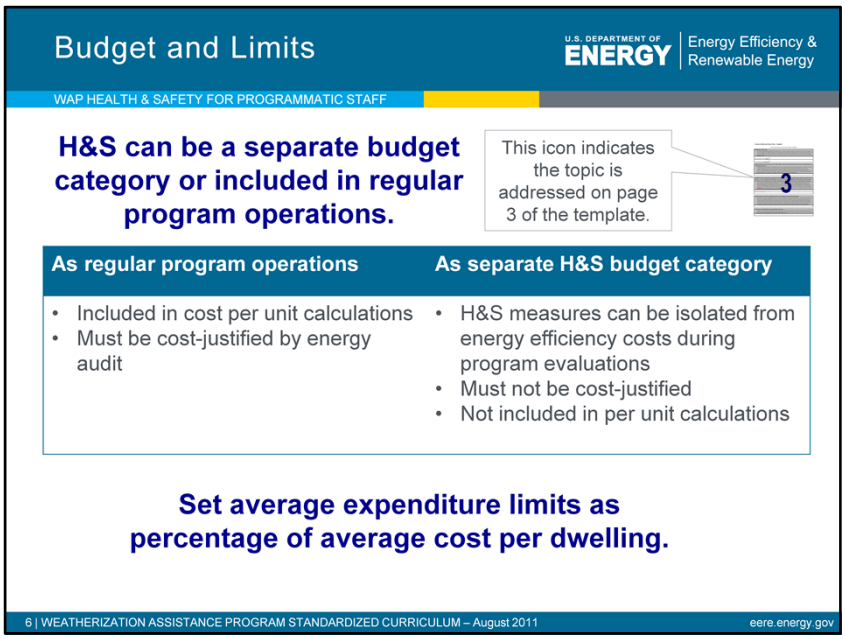
To implement 11-6 in the DOE WAP, grantees need to draft a Health & Safety plan that addresses all of the issues outlined in the guidance, identifies average spending limitations, and more.

As we go through the issues one by one, we'll address each of the items listed here and any others that must be included in the H&S plan with the relevant topic.

Refer to the provided Health and Safety Plan Template. We will refer to this template throughout the rest of the presentation and use the opportunity to draft language around each issue covered.

The above graphic will be used as an icon with a page number corresponding to the relevant presentation topic in the template.



The grantee must show how they will budget their health and safety costs. These costs can either be in a separate health and safety budget category, or as part of the regular program operations. The grantee is encouraged to budget health and safety costs as a separate category, thereby excluding these costs from the average cost per unit calculation. Creating a separate budget category also allows these costs to be isolated from energy efficiency costs for program evaluation purposes. The grantee is also reminded that, if health and safety costs are budgeted and reported under the program operations category rather than a separate health and safety category, the costs must be included in the calculation of the average cost per unit and cost-justified through the energy audit.

The grantee will set health and safety expenditure limits, providing justification for the basis of these limits. These limits must be expressed as a percentage of the average cost per dwelling unit. While it has been a common practice to accept 10 percent as a benchmark for the health and safety allowance, the grantee should establish a percentage that best reflects both the history of these applications and the updated details of the H&S protocols in the Plan. A higher percentage requested for H&S requires more stringent documentation to support the costs. While required as a percentage of the average unit cost, if budgeted separately, the health and safety costs are not calculated into the per-house limitation.

Note the icon in the upper right corner of the slide. This indicates where this topic is found in the template. If time allows go to page 3 of the template and draft language. If you continue this process throughout the presentation, you should be able to complete the health and safety plan or at least take notes to help lead discussions for your update.

Budget and Limits

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To calculate average H&S expenditure limits you must set an average cost per dwelling unit

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Determining program operations	Determining H&S expenditures
Determine your average cost per dwelling unit (not to exceed $6,500). Determine the planned number of homes to weatherize (represented as 10,000 in the example).	Determine the amount needed for health and safety in the average home ($650 in the example) as a percent of the average cost per dwelling unit ($6,500).
$6,500 x 10,000 = $6,500,000	$650 / $6,500 = %10

Program Operation x H&S Percent = Total H&S Budget
$6,500,000 x 0.10 = $650,000

Or

Average H&S Expenditure Limit x Planned # of Homes = Total H&S Budget
$650 x 10,000 = $650,000

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To calculate an average H&S expenditure limit you must first determine an average cost per dwelling unit for energy conservation (not to exceed $6,500) as well as the number of homes planned for weatherization during the program year. This will give you the total amount budgeted for program operations and does not include budget categories such as training & technical assistance or administrative costs, nor does it include the health and safety budget category.

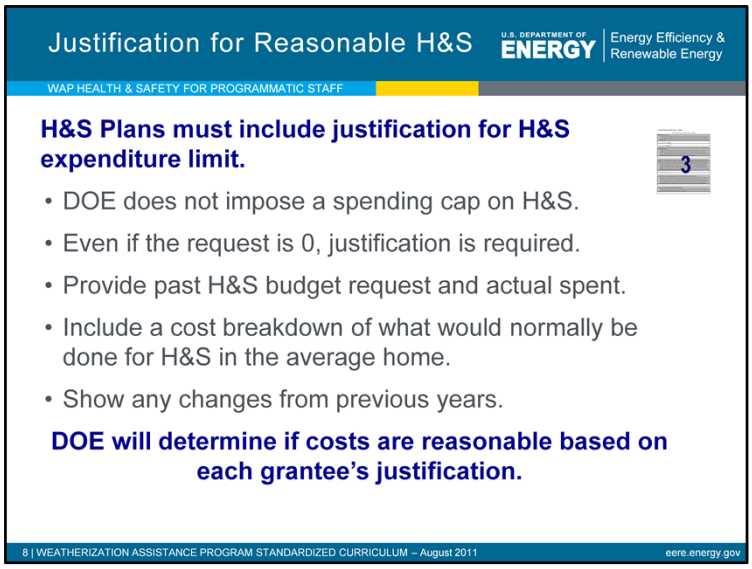
To determine total program operations, multiply the average cost per unit, here $6,500, by the number of homes you plan to weatherization during the budget period. We selected 10,000 just to make the math easier. The total program operations budget would be $6.5 million.

For the next step, you must determine how much you will need to spend in the average home for health and safety. We will discuss how to determine this amount in a moment when we discuss health and safety justification in the plan. For this example, we decided that the homes for this particular grantee program need about $650 on average for health and safety. To determine the average expenditure limitation for health and safety, just divide the $650 average limit by the per unit average cost of $6,500 to get a 10 percent health and safety budget.

Determining your total health and safety budget can be done two ways, and I suggest trying it both ways to confirm the totals. For the total health and safety budget, multiply the total program operations by the percent decided for health and safety. Here we had 6.5 million x 10 percent or .10 to get a $650,000 health and safety budget.

The other option would be to multiply the average H&S expenditure limit, $650 here, by the planned number of homes (10,000) which also equals the $650,000 H&S budget.

Again, while the calculation is done using the average cost per dwelling unit, the H&S costs are not included as part of the $6,500 limit for the unit – they are in addition to that amount. Incidental repairs, however, must be cost-justified and are included in the $6,500 average per dwelling limit.



H&S plans must include justification for H&S expenditure limits, regardless of what was approved historically by DOE for the grantee. Justification is required even if the request is zero for example, stating that other funding will be used or that the grantee is including H&S costs in the program operations budget category and choosing not to have a separate H&S budget. The amount of justification required will depend on the percent requested for H&S.

It is helpful to state previously approved H&S budget percentages and the actual percent spent for past program years. This identifies what has been done historically by the grantee and should be sufficient for budgets that are not increasing drastically and are around 10%. If there is a big gap between requested and actual expenditures, then you should question if the request is appropriate and be sure to state why in your H&S plan. This should detail any changes from previous years that might affect H&S expenses, like implementing the new ASHRAE 62.2 requirements.

When requesting higher amounts, it is important to provide additional documentation detailing how the requested amount per home was reached by the grantee. This should be documented in the plan as justification for the request. It should include a breakdown of costs for all H&S activities that are normally conducted in a home, again identifying any new categories that may not have been addressed in previous years.

DOE will determine if costs are reasonable based on each grantee justification.

H&S Costs Sample Table

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Allowed Measure	Average Cost	Frequency	Total
Measure A	$100	40%	$40
Measure B	$500	10%	$50
Measure C	$1000	20%	$200
Measure D	$200	90%	$180
Measure E	$50	100%	$50
Total:	$1850		$520

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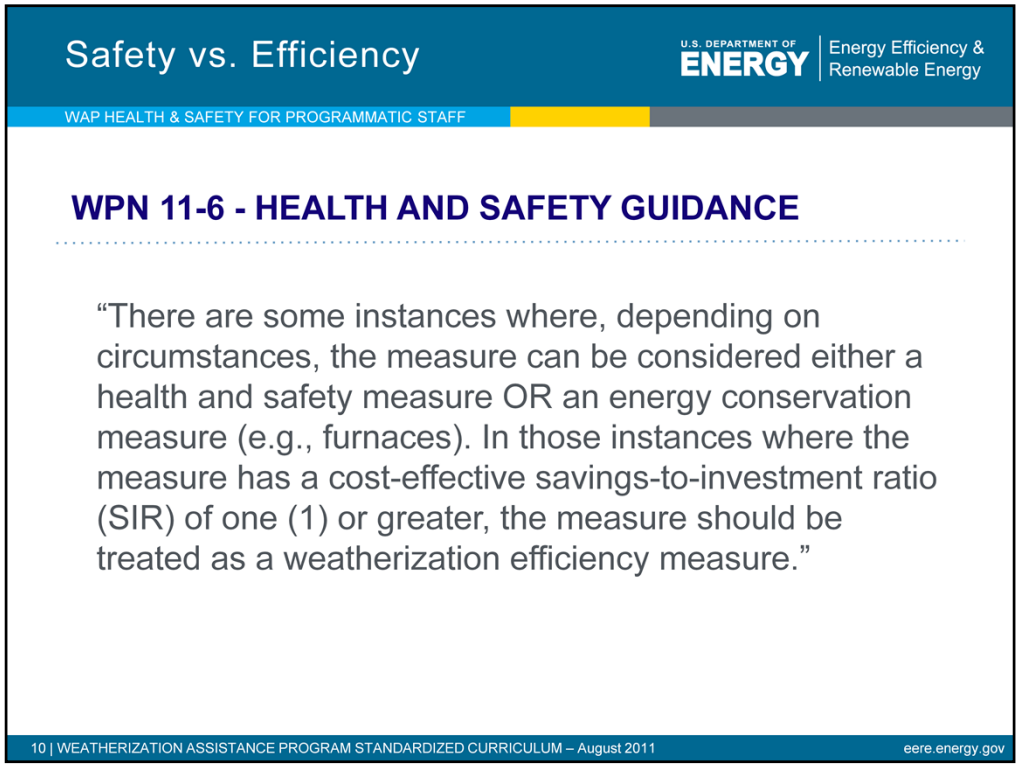
To determine and justify average health and safety costs, a table could be used in your plan to show the amount of money spent on H&S in a normal unit. The more detail, the better the justification, and the more informed the grantee will be in making the decision. It could also help with consideration for defining some H&S issues as incidental repair, which will be discussed in more detail later during this presentation.

The sample table includes a list of the allowed measures identified in your H&S plan, their average cost, and how often they are performed. Measure A might be Lead Safe Work, Measure B could be ventilation, C could be furnace replacement, etc. For example, furnace replacement might cost $1,000 and you replace them for H& in approximately 20% of the units weatherized. The average H&S expenditure for this issue is $200. This will show how much is spent on each issue in the average home and when totaled, determine how much should be requested for H&S costs.

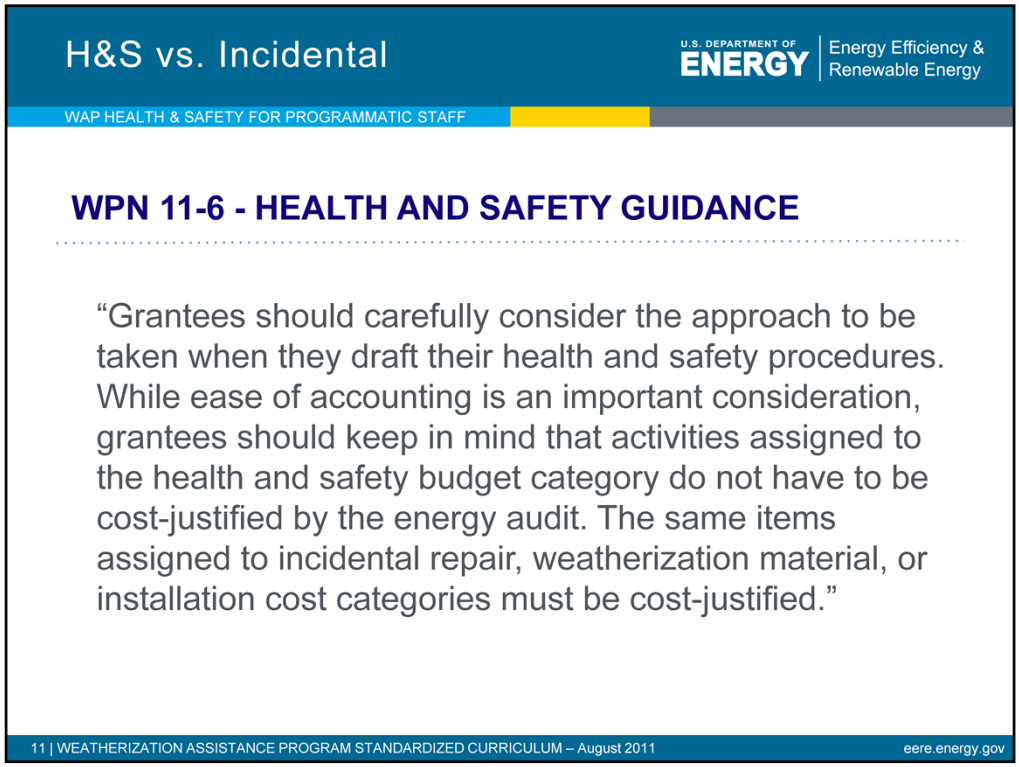
These estimates can be rough but they should be based on your actual housing stock and could even be developed from a random sample of client files. Be sure to state how you determined your estimates.

While the maximum that would be spent for any one home is $1,850 in our example, the average amount spent per home is $520, which would be the amount requested as a percentage of the average per unit production cost.

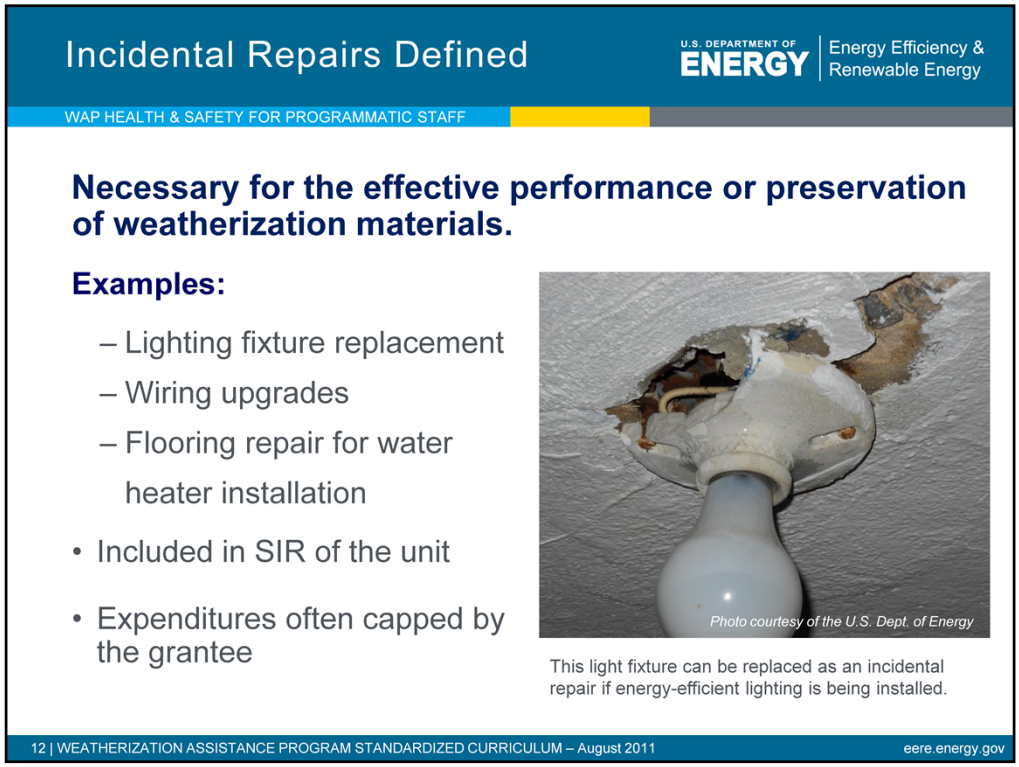


Grantees will perform those measure in 11-6 with health and safety funds, unless they can be stand alone energy conservation measures, or they are defined as incidental repair in the grantee Health & Safety Plan, effectively removing them from the health and safety budget category.

If measures such as furnace or water heater replacement can potentially be cost-justified through the audit or priority list, then they must be reviewed. If they achieve an SIR of 1 or greater, they are cost-justified and must be charged to regular program operations. If it is determined that the measure is not cost effective, it can be considered for health and safety repair or replacement.

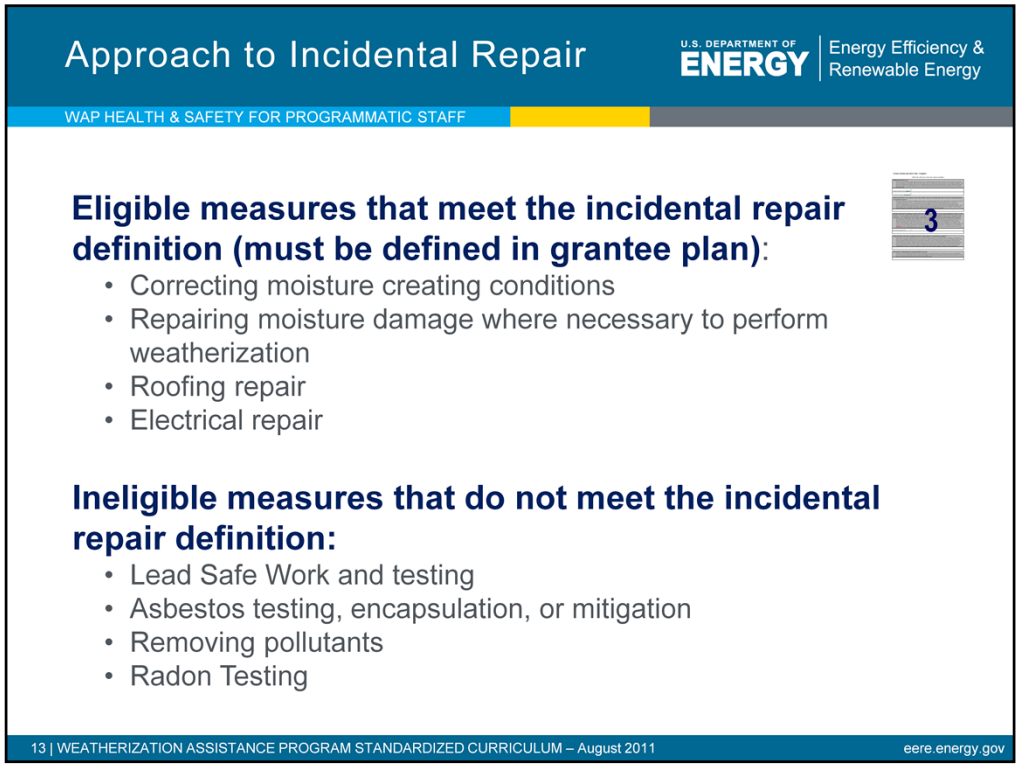


When defining those measures in 11-6 as incidental repair in the grantee Health & Safety Plan it removes them from the health and safety budget category. This practice can help manage health and safety budget limitations, but it must be done consistently across the program. If a grantee does not remove health and safety measures identified in 11-6, then they must be performed with health and safety funds. If some are removed, be sure to state clearly within your health and safety plan that they will be performed as incidental repair and must be cost-justified with the package of measures.



Incidental repairs are those repairs necessary for the effective performance or preservation of weatherization materials. Incidental repairs are different from the regular energy conservation measures installed in homes, and some rules apply:

- Incidental repairs must assist in the performance or protect energy-saving measures – Incidental repairs may be necessary to ensure the lifetime of the energy conservation measures being installed in the home. For example:
  - Lighting fixture replacement – You can replace a hardwired lighting fixture if it is necessary to install energy-efficient lighting
  - Wiring upgrades – This can be done when it is a component of the measure being installed, such as upgrading wiring to handle the extra load of a cooling system
  - Flooring repair for water heater installation
- Costs must be included in the ***savings-to-investment ratio*** (***SIR)*** calculations. Incidental repairs must pass the cost-effectiveness test. While the justification of incidental repairs must be tied to a measure or specific group of measures, the price of incidental repairs can be included in the entire package of measures. If the SIR is still 1 or higher and the repairs meet the requirements listed above, the incidental repairs may be performed. Because of this rule incidental repairs are self-limiting costs – they can't exceed what will fit into the SIR of the total package of measures.
- Expenditures are sometimes capped by the grantee to prevent unreasonable spending on non-energy-saving repairs. Expenditures are typically capped at a certain dollar amount per home ($500 per home, for example) or at a percentage of the maximum allowable cost per home.
- Remember when drafting your H&S plans that measures designated as incidental repairs must meet DOE's definition. The purpose and justification of the repairs, and corresponding measure or group of measures must be documented in the client file.



Some measures that are eligible to be removed from the H&S budget category and identified as incidental repairs are:

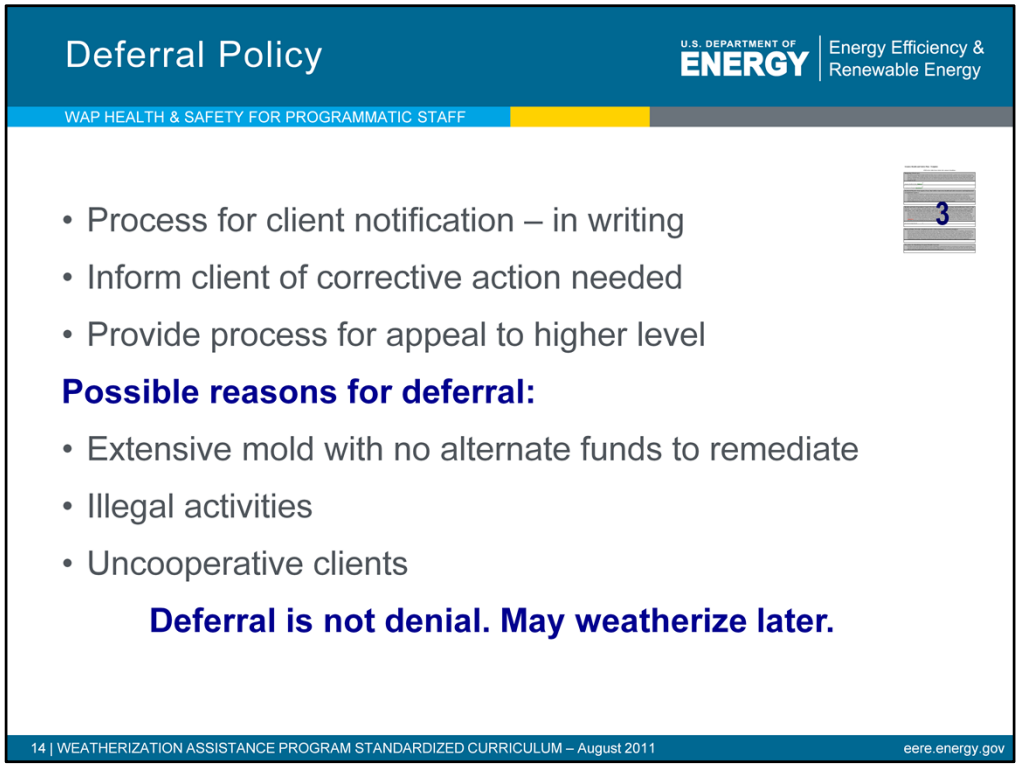
- Correcting moisture creating conditions
- Repairing moisture damage where necessary to perform weatherization
- Roofing repair
- Electrical repair

If you choose to remove measures from the H&S budget category and define them as incidental repairs, this must be clearly stated in the H&S plan. The definitions must be applied consistently across your service territory, and those measures can no longer be charged to the health and safety budget category.

Think carefully about how broadly or narrowly you define an incidental repair. For example, once a grantee determines to conduct all moisture repair related to drywall as an incidental repair it must always be conducted as an incidental repair and be cost-justified. Defining this aspect of moisture repair as an incidental repair may help manage your budget without unduly constraining your program. A broader definition stating that all moisture repair must be charged as incidental repair is far more limiting. Similarly, removing all roof repair from the health and safety budget category could help manage the H&S expenditure limit, but it may also increase deferrals if the package of measures can't achieve an SIR of 1 or greater.

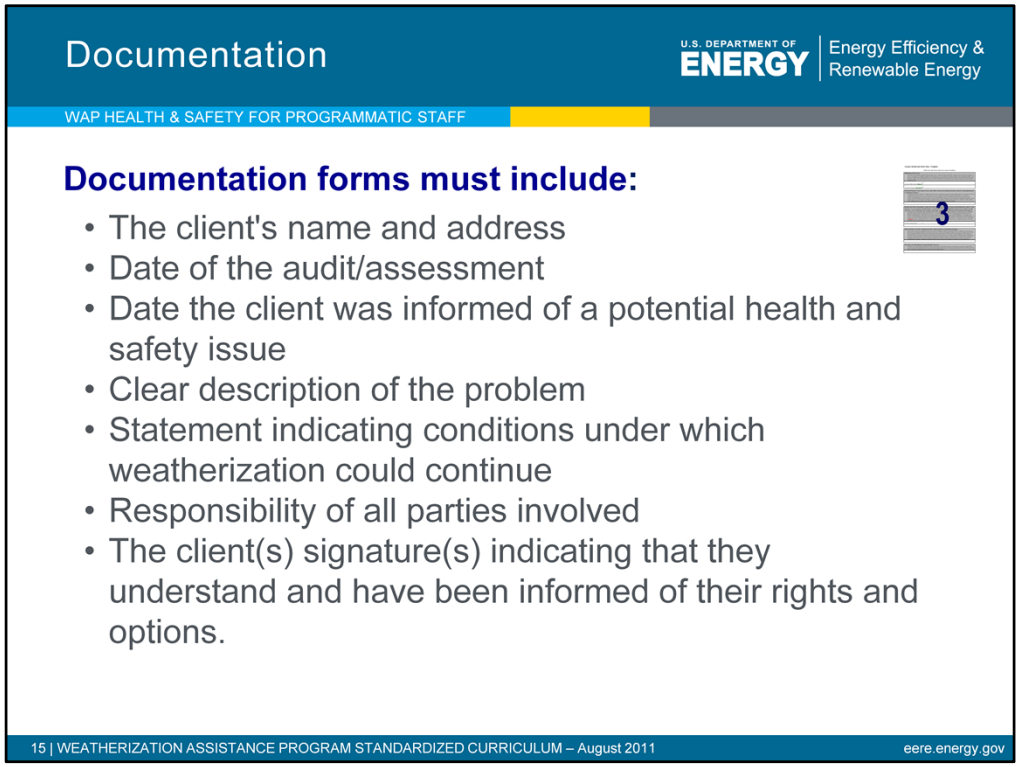
The measures that do not meet the definition of incidental repair and cannot be separated from the H&S budget category include:

- Lead Safe Work and testing
- Asbestos testing, encapsulation, mitigation
- Removing pollutants
- Radon Testing

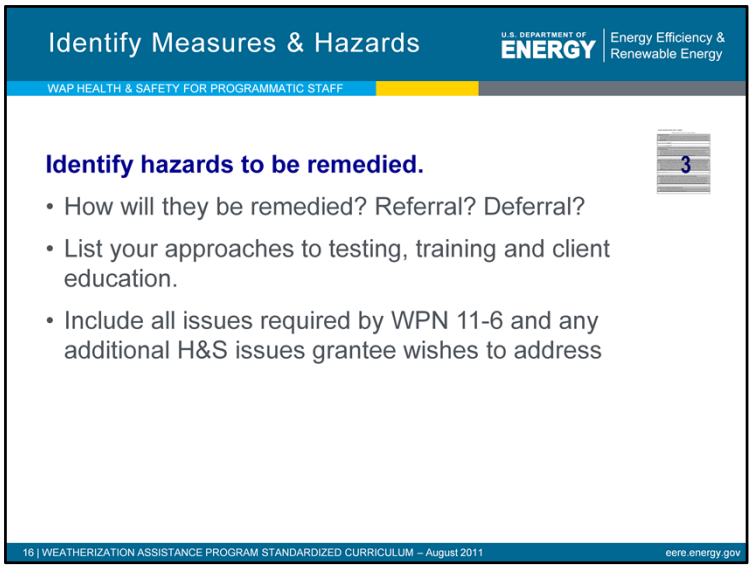


The grantee must create a deferral policy. This part of the H&S Plan should outline the general policy, but more specific deferral/referral information should be provided for each H&S issue where applicable. Deferral may be necessary if health and safety issues cannot be adequately addressed according to WPN 11-6 guidance. The decision to defer work in a dwelling is difficult but necessary in some cases. This does not mean that assistance will never be available, but that work must be postponed until the problems can be resolved or alternative sources of help are found. If in the judgment of the auditor, any conditions exist that may endanger the health or safety of the workers or occupants, and these conditions cannot be corrected with H&S funds, the unit should be deferred until the conditions are corrected. Deferral may also be necessary where occupants are uncooperative, abusive, or threatening. The grantee should be specific in their approach and provide the process for clients to be notified in writing of the deferral and what corrective actions are necessary for weatherization to continue. The grantee should also provide a process for the client to appeal to a higher level in the organization.

There is a sample Deferral of Services notification letter included with the bundle of materials for this presentation.



Grantees must develop forms to include these listed components. The client must be informed in writing of any observed H&S hazards and a copy signed by the client must kept in the client file.



The grantee must identify the hazards to be remedied; anticipated approaches to testing, training, and client education; and conditions that require referral to other agencies. The Health and Safety Plan should comply with WPN 11-6, addressing each issue identified in the Guidance as well as any additional health and safety issues the grantee wishes to address. This should include guidelines for determining and documenting whether the potential health and safety issue should be remedied, referred to other agencies, result in partial weatherization, or lead to deferral. Subgrantees are expected to pursue reasonable options on behalf of the client, including referrals, and to use good judgment in dealing with difficult situations.

The grantee must:

- Develop procedures that include a method for determining when DOE monies will be used to remedy the health and safety issue, and how the grantee will treat problems that cannot be remedied with DOE monies after discovery.
- Specify how training will be provided for each of the health and safety issues included in the grantee's H&S Plan, and how agency staff will determine the presence of any health and safety problem that requires action by the subgrantee, including, at a minimum, those tests required in WPN 11-6 (e.g., combustion safety testing).

As each issue is discussed, consider if it would be best defined as H&S or as an incidental repair in the grantee plan, and if defined as H&S, how identified hazards would be approached. If chosen as incidental repair be sure to state that H&S funds cannot be used to address the issue.

The Issues

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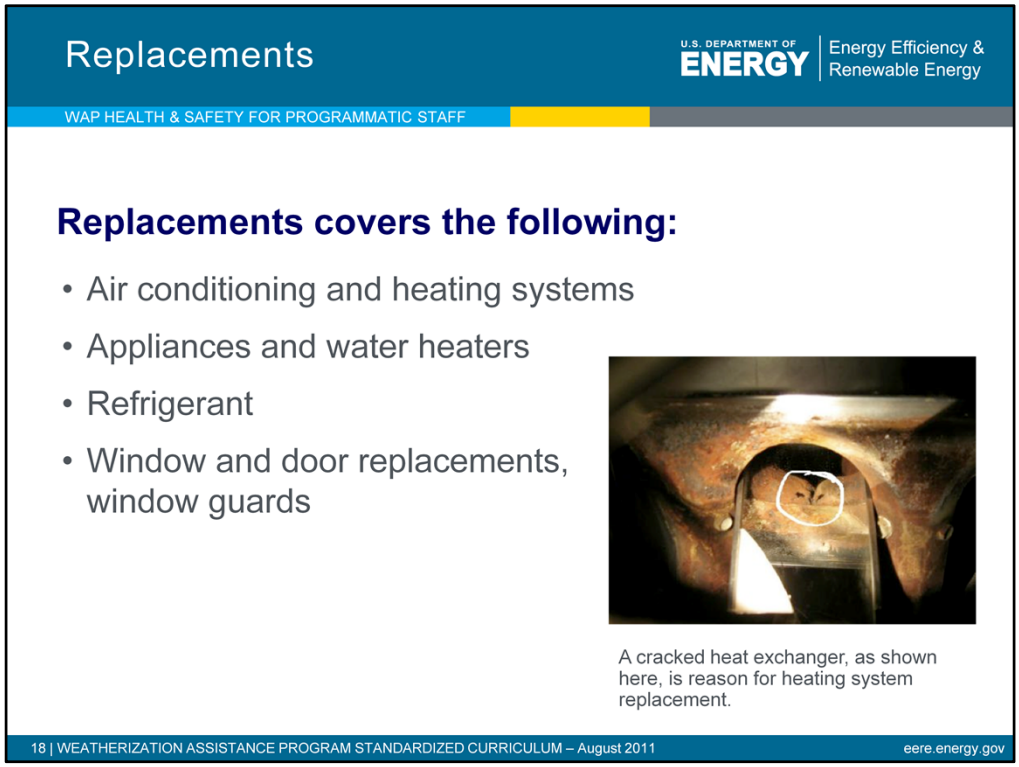
All of the H&S-related issues described in 11-6 fall into 10 broad categories:

- Replacements
- Asbestos
- Codes & Structure
- OSHA for WAP
- Lead-based Paint
- Mold & Moisture
- Radon
- Combustion Appliance Safety and Heating Systems
- Occupant Wellness

For training purposes, DOE divided the H&S issues addressed in 11-6 into 10 broad categories each encompassing multiple H&S issues. Through the rest of this course, we will look at the issues within each category and review what is allowed, what is required, and what is restricted, based on the most current DOE guidance.



Replacements covers:

- Air conditioning and heating systems
- Appliances and water heaters
- Refrigerant
- Window and door replacements and window guards

Air Conditioning and Heating Systems

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Allowed	• "Red tagged", inoperable, or nonexistent heating system replacement, repair, or installation is allowed where climate conditions warrant, unless prevented by other guidance. • "Red tagged", inoperable, or nonexistent air conditioning system replacement, repair, or installation is allowed in homes of at-risk occupants where climate conditions warrant.
Required	• Replacements should first be attempted as an ECM. • Provide client education on maintenance and use of new system. • Provide client education on proper disposal of bulk fuel tanks when not removed during weatherization. • Definition of at-risk occupants (for air conditioning replacement) and climate condition justification must be in the grantee's health and safety plan.
Restricted	• Air conditioning and heating systems cannot be replaced where climate conditions do not present a health and safety threat. • Air conditioning systems cannot be replaced with H&S funds if occupants do not meet grantee definition of "at-risk".

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Throughout the rest of this presentation, be sure to note the format where green is allowed, yellow is required, and red is restricted for each specific H&S issue.

Where an activity is allowed, grantees have flexibility over how they address that portion of the guidance in their health and safety plans. Where an activity is required or restricted, the language in WPN 11-6 or similar language conveying the same point must be stated in the grantee's health and safety plan. Just to be clear, when required or restricted, it must be carried from 11-6 guidance into the grantee's health and safety plan.

For air conditioning and heating systems - replacement, repair, or installation is allowed, but must have a climate justification provided in the H&S plan.

Repair, replacement, or installation of cooling systems must be justified by climate conditions and also be accompanied by the presence of an "at risk" occupant, as defined in the grantee H&S plan.

Always attempt an SIR on replacements, and perform as an energy conservation measure when it is cost-justified by an SIR of 1 or greater.

AC and Heating System Replacements in the Plan

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To ensure uniform implementation, the H&S Plan must include:

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Heating Systems	Cooling Systems
	Definition of "at risk occupants"
Explain protocols for repair and replacement, include justification for allowing repair/replacement as H&S measure within scope of grant	
Climate justification – include degree days and recorded preventable deaths	

An attempt must be made to cost-justify the measure prior to using H&S funds.

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The grantee must provide an explanation of protocols for the repair and replacement of both heating and cooling equipment. This should include:

- In what instances the measure can or cannot be conducted,
- Climate justification with degree days, and
- How the grantee defines "at-risk occupants" for cooling allowance. For example, will "at-risk" be anyone over 70 or under 5? Will it include certain health conditions?

If you concur with WPN 11-6, completing the concurrence sections is as simple as copying the allowability for this measure as written in WPN 11-6. If you opt to adopt alternate guidance, draft language addressing the allowability of this measure within the scope of your service delivery in the space provided.

This requirement is consistent for each issue. Where WPN 11-6 requires or restricts certain actions, those guidelines must be followed, even when adopting alternate guidance for the allowed components of an issue.

In the plan, state for those measures identified in 11-6 that could potentially achieve an SIR of 1 or greater - When the measure can be cost-justified, it cannot be installed with H&S funds. All replacements must be determined by the audit or priority list not to be eligible efficiency measures before considering them as H&S measures.

Appliances and Water Heaters

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Replacement of water heaters is allowed on a case-by-case basis as defined in the grantee's health and safety plan. • Repair and cleaning of water heaters and other appliances is allowed if necessary in order to perform weatherization measures.
Required	• Replacements should first be attempted as an ECM. • Determine whether appliances/water heaters are performing safely. • Combustion safety testing is required wherever combustion appliances are present. • Provide client education on proper use, maintenance and disposal of appliances.
Restricted	• Replacement and installation of appliances other than water heaters, such as stoves or washing machines, are not allowable health and safety costs.

Water heaters are the only appliance that can be replaced as a health and safety measure. Other appliances may be cleaned, tuned, and repaired, but not replaced, as a health and safety measure.

Notice that in the "required" section of the slide, combustion safety testing is required. If you have a gas oven that tests poorly, you may repair or tune the appliance, but not replace it.

Appliance and Water Heater Replacements

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

When replacing hot water heaters or heating/cooling systems for H&S reasons, or any appliances as energy conservation measures, removal and proper disposal or the old appliances is required. Appliances may not be left behind for the client to deal with.

As with any appliance replacement, the old water heaters must be removed and properly disposed of.

On page 4 and 5 of the template, define your protocol for water heater replacements. Under what conditions will you allow the replacement of water heaters? Instruct agency staff to document what conditions were present that led to replacement in the client files.

Briefly describe your disposal procedures, or indicate where these procedures can be found in the state plan or technical field guide.

Refrigerant

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

When working with or replacing refrigerators or air conditioners, refrigerants must be handled according to these guidelines:

Allowed	• Refrigerators may be replaced as an energy conservation measure (ECM). Cooling systems may be tuned or replaced as an ECM or replaced as a H&S measure.
Required	• Reclaim refrigerant per Clean Air Act 1990, section 608, as amended by 40 CFR82, 5/14/93. • Refrigerants must be handled by technicians certified under EPA section 608. • Appliance disposal includes refrigerant reclamation. • Educate clients not to disturb refrigerant.
Restricted	• Non-certified technicians may not attach or disconnect hoses or gauges to measure pressure within the appliances, top-off or remove refrigerant from appliances, or otherwise damage the integrity of the appliance.

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Many refrigerators, window A/C units and dehumidifiers contain chemicals that are harmful to the environment if released. Proper handling of these chemicals is outlined in section 608 of the 1990 Clean Air Act, and weatherization work must adhere to these guidelines.

You can find the EPA list of approved 608 Certification training online at www.epa.gov.

When detailing client education requirements in your H&S plans, you could require that the client receive the included “Safe Disposal of Refrigerated Household Appliances FAQ” developed by the EPA.

Handling Refrigerant

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Non-certified technicians may not attach or disconnect hoses or gauges to measure pressure within the appliances, top-off or remove refrigerant from appliances, or otherwise damage the integrity of the appliance.

If gauges like these are in use, an EPA-certified technician must be doing the work.

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If gauges like the ones shown here are in use, an EPA-certified technician must be doing the work.

At this time, you could take a few minutes to draft procedures around safe refrigerant handling on pages 14 and 15 of the template.

Window & Door Replacement; Window Guards

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Allowed	• Replacement, repair, or installation of doors, windows, or window guards may be allowed as an incidental repair or an ECM if replacement is cost-justified by a DOE-approved energy audit. • In cases where code compliance is triggered by weatherization activity, health and safety funds can be used to meet the requirements of the jurisdiction having authority. 18
Required	• If disturbing lead paint, follow Lead Safe Work (LSW) practices and provide information on lead risks to the client. • If complying with local code requirements, the specific code must be noted in the client file with reference to the related weatherization measure(s) that triggered the code activity.
Restricted	• Replacement, repair, or installation of doors, windows, or window guards is *not* an allowable health and safety cost.

Windows and doors may only be replaced as energy conservation measures when they are cost-justified as a stand alone measure. There may be times when they could be repaired as incidental repair or rolled into the SIR as a part of an ECM, as with air sealing. In many climates, windows and doors will not be cost-effective as ECMs, or may not be high enough on the priority list to be installed.

Repair, replacement, and installation are not allowed with H&S funds, except in cases where code compliance is triggered by weatherization activity. The code requirement must be noted in the client file along with justification for the repair or replacement. Note, that the purpose is to meet code compliance and should not include anything beyond what is required.

You can use the included "Worksheet - Comparison of Heat Loss and Potential Savings by Building Component" to walk through some calculations to determine if window replacements produce cost-effective energy savings more so than other measures, like insulation.

Refer page 18 of the template to draft language addressing window and door replacements in your Plan.

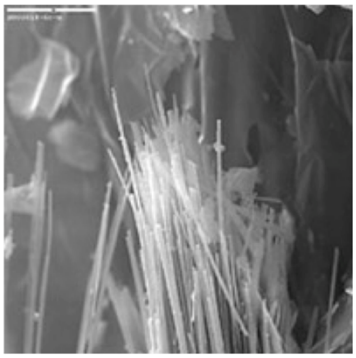
Asbestos

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Asbestos covers the following:

- Asbestos – in siding, walls, ceilings, etc.
- Asbestos – in vermiculite
- Asbestos – on pipes, furnaces, and other small covered surfaces



This scanning electron micrograph of asbestos shows the tiny, glass-like fibers that make asbestos so dangerous. These miniscule fibers become lodged in the lungs and can cause mesothelioma or other cancers.

Photo source: U.S. Geological Survey and U.S. Environmental Protection Agency, Region 8, Denver, Colorado

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Asbestos fibers can be dangerous to installers and clients if they are friable and could become airborne. Long-term exposure to airborne asbestos fibers can cause lung cancer and other serious health concerns. For this reason, we want to safely handle asbestos and protect the health of our weatherization network and the population we serve.

Asbestos is found in a number of building materials, which are encountered regularly in weatherization - from pipe insulation and ceiling panels, to vermiculite insulation and some siding. WPN 11-6 breaks asbestos into three categories, allowing grantees to tailor their plans to treat the hazards according to their housing stock, program budgets, and partnerships with other organizations that can safely encapsulate or remove this material.

Asbestos in siding, walls, ceilings, etc.

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Removal of siding is allowed when necessary to perform energy conservation measures. • Recommended, where possible, to insulate through home interior.
Required	• Inspect exterior wall surface and subsurface for asbestos siding prior to drilling or cutting. • All precautions must be taken not to damage siding. • Inform the client that asbestos siding is suspected present and what precautions will be taken.
Restricted	• Asbestos siding must never be cut or drilled. • Labor and material costs for activities that would have been conducted anyway, without consideration for asbestos, are not covered by health and safety funds.

Asbestos siding must be dealt with when installing dense-pack sidewall insulation through the exterior or otherwise penetrating the building envelope. Removal of siding is allowed for this or other purposes necessary to perform weatherization activity. Installers should never cut or drill through asbestos siding, and must take every precaution to avoid damaging the siding when removing.

Asbestos in vermiculite

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Allowed	• Encapsulation by a certified asbestos control professional is allowed. • Where blower door tests are performed, it is a best practice to perform pressurization instead of depressurization. • Asbestos Hazard Emergency Response Act of 1986 (AHERA) certified prescriptive sampling is allowed by a certified tester.
Required	• Assess whether vermiculite is present. • When vermiculite is present, unless testing determines otherwise, take precautionary measures as if it contains asbestos, such as not using blower door tests and using personal air monitoring in attics. • Instruct clients not to disturb suspected asbestos-containing material. • Provide asbestos safety information to the client. • Formally notify client if test results are positive for asbestos and acquire client's signature.
Restricted	• Removal is not allowed.

Not all vermiculite contains asbestos, but the largest U.S vermiculite mine, in Libby, MT, is known to contain asbestos.

There is still some debate on the accuracy of results obtained from EPA's current recommended testing protocols. Given the absence of alternative, universally acknowledged testing procedures, and the widespread existence of vermiculite insulation in the housing stock most served by weatherization in some parts of the country, 11-6 allows states to follow jurisdictional testing procedures to determine the presence of asbestos and therefore serve the largest population possible. Be sure to determine what is allowed through your state and make sure that it recognizes certified control professionals to perform testing and encapsulation.

Take precautionary measures unless vermiculite is known <u>not</u> to contain asbestos.

If testing determines asbestos is present, require workers to wear air monitoring devices while working around the material. Encapsulation is allowed by 11-6 but the vermiculite may not be removed with weatherization funds.

If testing determines no asbestos is present, weatherization may proceed as usual.

In other words, you can decide to allow testing and act accordingly, or you can decide to treat all vermiculite as if it contains asbestos.

Refer to page 5 of the template. Determine if you will allow testing or make a note to contact your jurisdictional authority for asbestos, likely the state? What safety protocols will you enact to ensure the safety of workers and clients?

Asbestos on pipes, furnaces, etc

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Encapsulation is allowed by a certified asbestos control professional. • Removal may be allowed by a certified asbestos control professional on a case by case basis as defined in the grantee's health and safety plan. • Testing is allowed by a certified asbestos control professional.
Required	• Assume asbestos is present in covering materials. • If conducting encapsulation, it must be completed prior to blower door testing. • Instruct clients not to disturb suspected asbestos containing material. • Provide asbestos safety information to the client.
Restricted	• Labor and material costs for activities that would have been conducted anyway, without consideration for asbestos, are not covered by health and safety funds.

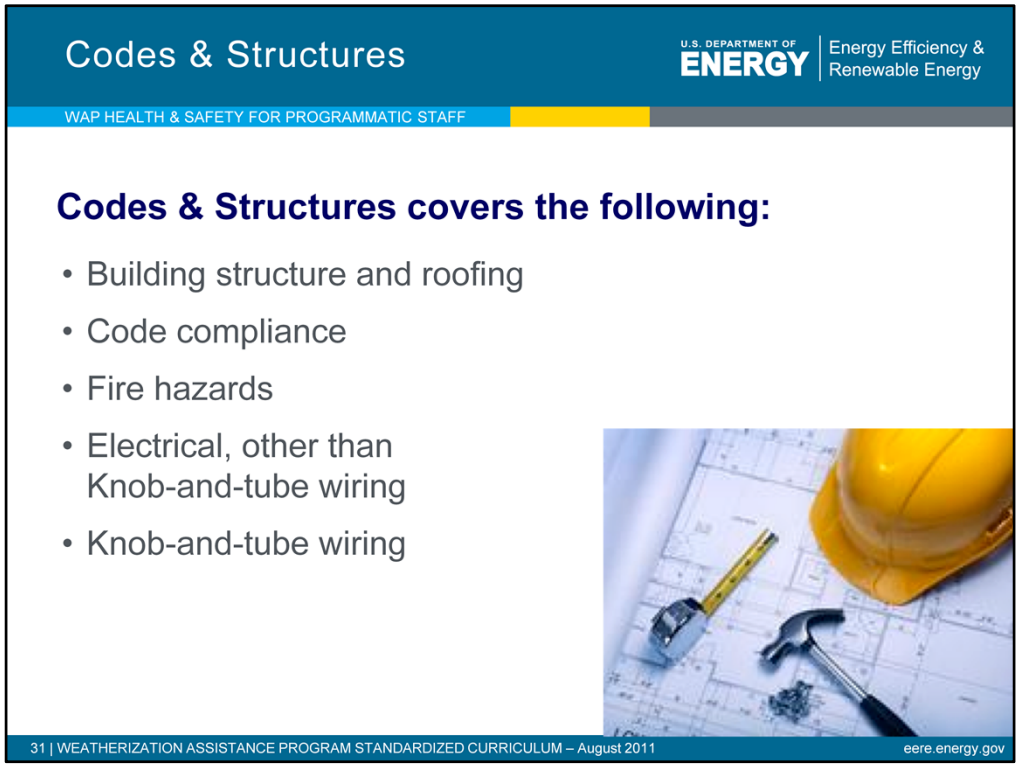
With asbestos on pipes, furnaces and other small surfaces, a little more flexibility is allowed. Encapsulation and removal are both allowed by certified control professionals. The conditions for each action should be clearly stated in the grantee plan. Unless testing determines otherwise, always assume asbestos is present in those materials that are likely to contain asbestos.

Removal is to be treated on a case-by-case basis. The decision making process can be made easier with clear guidance from the grantee in their health and safety plan. For instance, the grantee may state that removal is allowed only when existing asbestos is friable, or likely to become airborne. The plan can also require review of each case by the state, and lay out the process for local agencies to follow.

Only those costs directly associated with the testing, encapsulation, or removal of asbestos can be charged as H&S costs. The other activities associated with the energy efficiency measure, those that would have occurred without consideration for the asbestos, cannot be charged to H&S.

That means if you are replacing an asbestos-covered boiler as an ECM, you can charge the asbestos-related costs to H&S, but the rest of the replacement costs are charged to regular program operations.

This is what asbestos looks like for the three categories addressed by this guidance: in siding, in vermiculite, and in small covered surfaces such as pipe wrap or furnace coverings.



Codes and Structures covers health and safety issues as they relate to:

- Building structure and roofing
- Code compliance
- Fire hazards
- Electrical hazards, and
- Knob-and-tube wiring.

Building Structure & Roofing

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Building structure and roofing repairs may be corrected with health and safety funds as they relate to code compliance (see code compliance) and mold and moisture (see mold and moisture).
Required	• Visual inspection. • Ensure that areas requiring access for performance of weatherization assessment, work, and inspection have safe access. • Notify client of structurally compromised areas.
Restricted	• Building rehabilitation is beyond the scope of the Weatherization Assistance Program. • Health and safety funds should not be used when the repair is a component of an ECM. In that case, the repair should be cost-justified as an incidental repair.

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Building structure and roofing repairs may be corrected with health and safety funds as they relate to code compliance and mold and moisture.

Many grantees have traditionally treated roof leak repairs as an incidental repair, necessary to preserve the integrity of insulation added to attics during weatherization. This new H&S guidance requires that roof repairs be treated consistently as H&S repairs or as incidental repairs. If you choose to designate roof repairs as incidental repairs, the designation must be applied consistently across the service territory. In that case, wherever roof repairs are not cost-justified as an incidental repair, the job must be deferred.

If the code issue is a part of the measure, such as reinforcing flooring to install a water heater, then the costs are not health and safety since this would have been done without regard to the 11-6 guidance.

Refer to page 7 of the template and develop language regarding structural and roof repairs. The default for roof repairs is now a H&S measure. If the grantees wish to remove those from the H&S budget, they must designate here that roof repairs will be incidental repairs.

Code Compliance

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Health and safety funds may be used to correct code compliance issues, but only where they are triggered by performing weatherization.
Required	• State and local (or jurisdiction having authority) codes must be followed while installing weatherization measures. • Condemned properties and properties where "red tagged" health and safety conditions exist that cannot be corrected under this guidance must be deferred. • Inform client of observed code compliance issues.
Restricted	• Correction of preexisting code compliance issues is not an allowable cost, other than where required due to weatherization measures being installed. • Health and safety funds should not be used when the repair is a component of an ECM, such as fixing a light fixture in order to install a CFL bulb. In this case, the repair should be cost-justified as an incidental repair.

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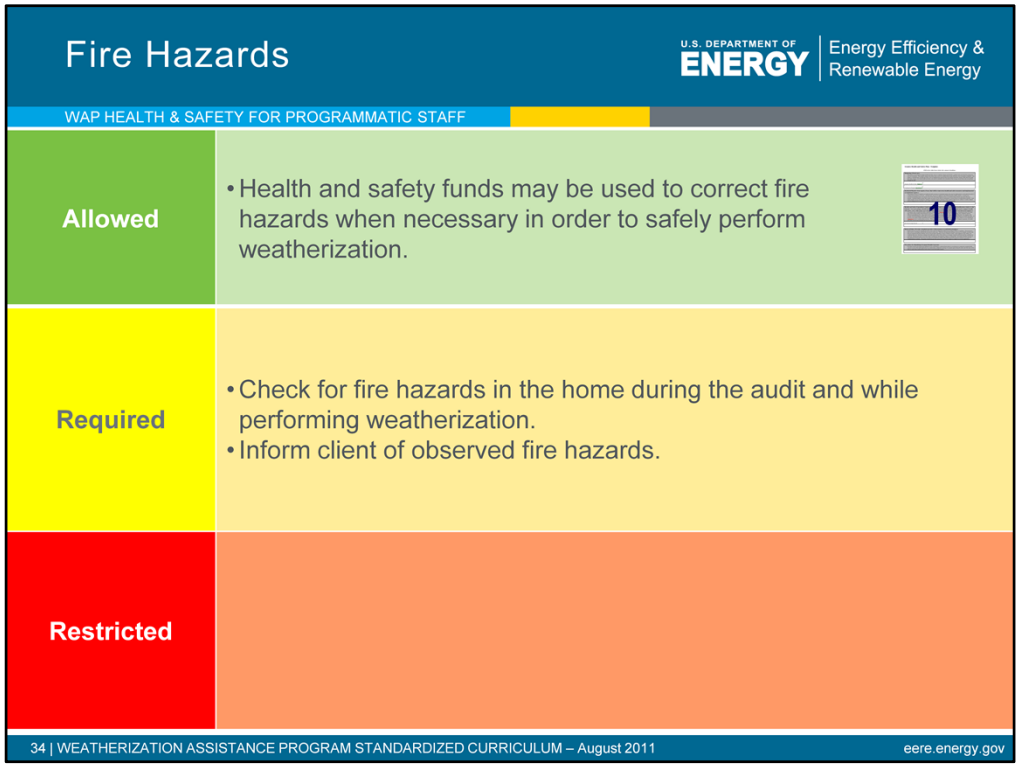
Health and safety funds may be used to correct code compliance issues only where they are triggered by weatherization activities.

An example of this may be when a client has a bedroom in the basement, but no code-compliant egress. If the basement is to be treated, air sealed and insulated for example, a basement egress may be added to the bedroom with H&S funds to bring the space up to local codes.

Refer to page 7 of the template and have attendees draft language for how they will handle code compliance issues.



We already address fire hazards somewhat regularly in the weatherization program when we correct combustion appliance venting problems. This guidance simply codifies the fact that grantees are allowed to use H&S funds to correct observed fire hazards when correction is necessary in order to perform weatherization.

If fire hazards are observed during weatherization, the client must be informed of those hazards even if they will not be treated during weatherization.

Electrical, other than Knob-and-Tube Wiring

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Minor electrical repairs are allowed where health or safety of the occupant is at risk and when necessary to perform specific weatherization measures. • Voltage drop and voltage detection testing are allowed.
Required	• Visual inspection. • Provide client information on overloading circuits and electrical safety/risks.
Restricted	• Health and safety funds should not be used when the repair is a component of an ECM. In that case, the repair should be cost-justified as an incidental repair.

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This guidance is purposely broad so that grantees can determine protocols that make the most sense for their program, and address the situations most often encountered in their housing stock.

If the electrical issue is a part of the measure, such as upgrading a circuit to handle the load for a new furnace being installed as an ECM, then the costs are not health and safety since this would have been done without regard to the 11-6 guidance

Refer to page 9 of the template and draft language describing your H&S protocols for minor electrical repairs. If a dryer must be moved in order to properly vent exhaust to the outside, will you allow the dedicated outlet to be moved with H&S funds? If an electric water heater has faulty wiring, will repairing that be an allowable H&S cost in your program? What procedure would you like local agency staff to follow when faced with a questionable electrical wiring issue? The plan should be detailed enough for local agencies to consistently make these types of decisions.

Knob-and-Tube Wiring

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Minor upgrades and repairs necessary for weatherization measures, and where the health or safety of the occupant is at risk, are allowed. • Voltage drop and voltage detection testing are allowed.
Required	• Must provide sufficient over-current protection prior to insulating over knob-and-tube wiring. • Inspect for presence and condition of knob-and-tube wiring. • Check for alterations that may create an electrical hazard. • Visual inspection. • Provide client information on overloading circuits and electrical safety/risks.
Restricted	• Replacing knob-and-tube wiring when the jurisdiction having authority allows related weatherization measures to continue is not allowed.

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Knob-and-tube wiring as originally installed is usually quite safe. It is the modifications that take place over time that lead to dangerous conditions when circuits are overloaded.

In jurisdictions that do not allow insulating over existing knob-and-tube wiring, the affected circuits may be replaced with H&S funds.

Where insulation *is* allowed over K&T after appropriate testing has confirmed the safety of those circuits, replacement of those safe circuits is not an allowable expense.

Knob-and-Tube Wiring

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Photo courtesy of Bill Van der Meer

This K&T circuit was dammed prior to insulating to prevent a fire hazard.

- H&S funds may be used to replace circuit, if required for insulation.
- Likely costs less than labor for this treatment.
- Will provide better insulation value for attic.

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The installers did a very nice job damming to keep insulation away from this K&T circuit…but was damming the best option in this case?

No.

Replacing the one circuit would likely have cost less than the labor and materials involved in damming. And replacing the circuit would have allowed a continuous blanket of insulation to be installed, improving the thermal envelope, and saving the client more on their energy bills.

OSHA for WAP covers the following:

- OSHA and Crew Safety
- Spray Polyurethane Foam (SPF)

OSHA for WAP covers the required OSHA training and spray polyurethane foam.

OSHA and Crew Safety

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Staff may receive additional OSHA training, as desired.
Required	• Workers must follow OSHA standards and Material Safety Data Sheets (MSDS) and take precautions to ensure the health and safety of themselves and other workers. • MSDS must be posted wherever workers may be exposed to hazardous materials. • Grantees must perform assessments to determine if crews are using safe work practices. • OSHA 10 hour training is required for all workers. • OSHA 30 hour training is required for all crew leaders.
Restricted	• Grantees and subgrantees may not "opt out" of OSHA training requirements.

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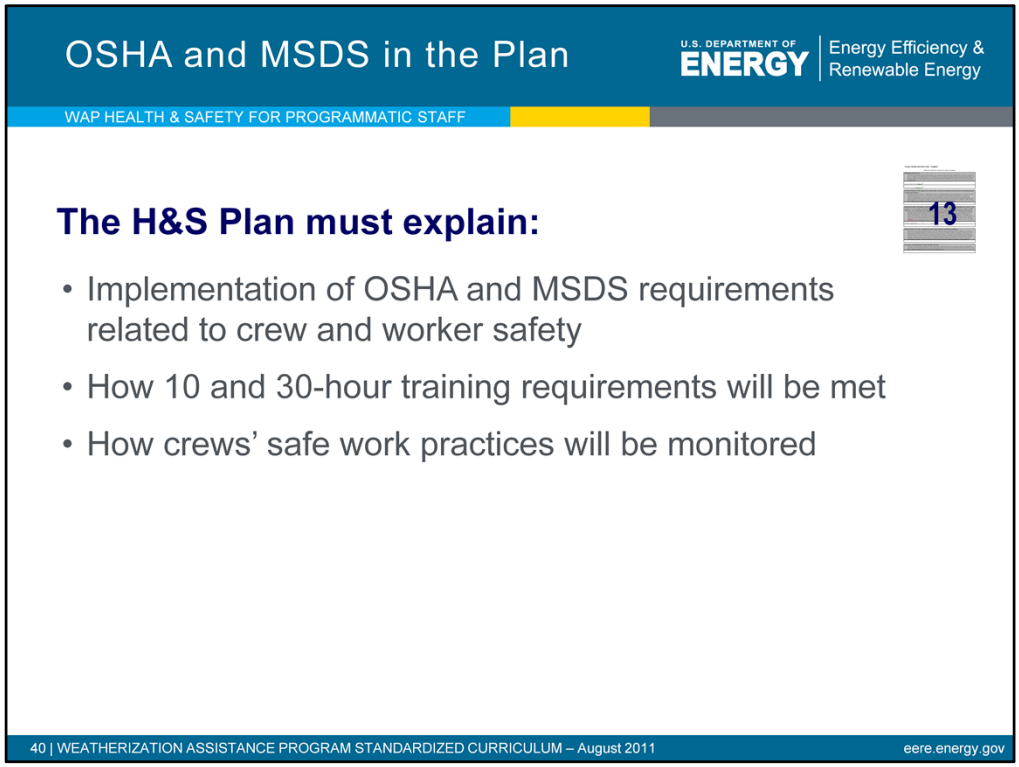
OSHA training is now required for all weatherization workers and crew chiefs. Workers must attend OSHA-10 training and receive the OSHA 10 certificate. Crew chiefs or an agency supervisor who is regularly onsite and can monitor and instruct work-site safety must attend and receive certification in the longer OSHA 30 course.

OSHA 10 covers basic safe work practices.

OSHA 30 deals more with developing and maintaining a work safety plan.

Every crew and contractor must also have the MSDS for any potentially hazardous materials used on the job, and make those sheets available to anyone who may be exposed to those materials. Having the MSDS handy can save valuable time for emergency personnel if an accident occurs and they need to determine the best treatment.



The grantee must explain implementation of OSHA and MSDS requirements related to crew and worker safety, how the 10 and 30-hour training requirements will be met, and what process is being used to determine if crews are using safe work practices according to all requirements.

OSHA Topics

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Topics covered in OSHA 10:

Mandatory - 4 hrs	Electives – 2 hrs
Introduction to OSHA – 1 hr • OSH Act • Inspections, Citations, Penalties • General Safety and Health Provisions • Competent Person • Value of Safety and health	Choose at least 2 of the elective topics: • Materials Handling, Storage, Use and Disposal • Tools – Hand and Power • Scaffolds • Cranes, Derricks, Hoists, Elevators & Conveyors • Excavations • Stairways and Ladders
OSHA Focus Four Hazards – 2 hrs • Fall Protection • Electrical • Struck by • Caught in/between	**Optional – 4 hrs**
Personal Protective and Lifesaving Equipment – 30 minutes	For the remaining four class hours: Teach any other construction industry hazards or policies and/or expand on the mandatory or elective topics.
Health Hazards in Construction – 30 minutes	

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4 of the 10 classroom hours required by OSHA 10 must cover mandatory topics, but agencies may select from a list of electives and create optional lessons for the remaining hours, to better gear the OSHA training toward weatherization.

Spray Polyurethane Foam

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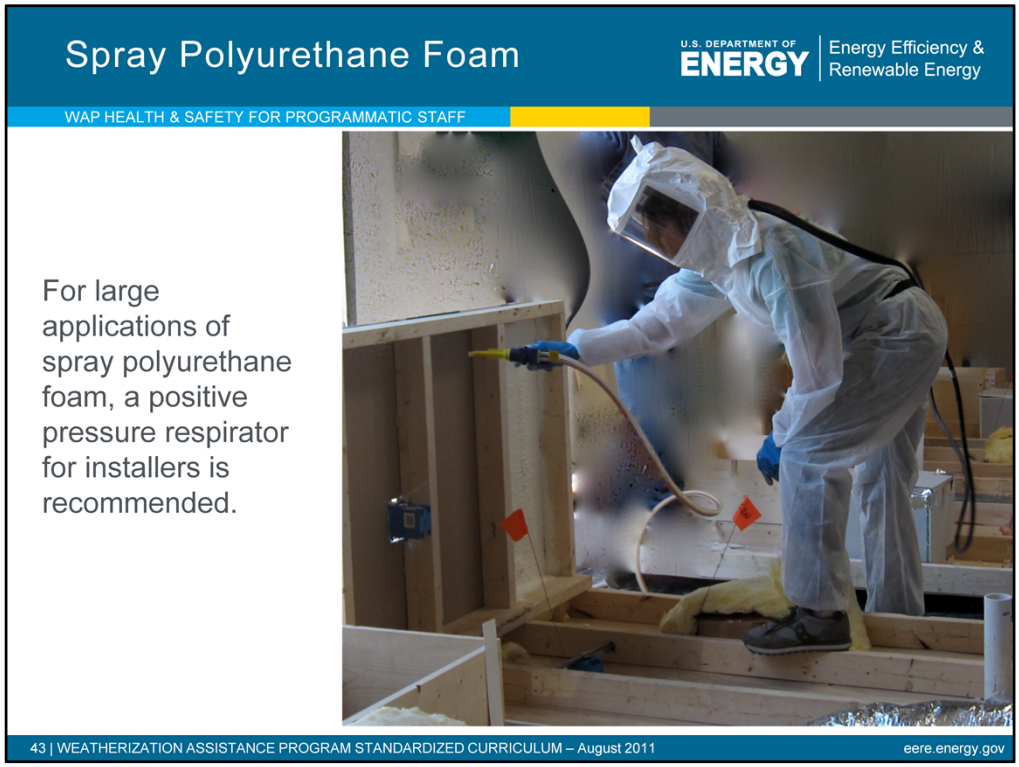
WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Spray polyurethane foam is allowed for use as long as appropriate precautions are taken.
Required	• Use EPA recommendations when working within, or when SPF fumes become evident within, the conditioned space. • When working outside the building envelope, isolate the area where foam will be applied, take precautions so that fumes will not transfer inside conditioned space, and exhaust fumes outside the home. • Use sensory inspection inside the home for fumes during foam application. • Provide notification to the client of plans to use two-part foam and the precautions that may be necessary.
Restricted	

Spray polyurethane foam (SPF) is widely used in the weatherization network, and it is an effective air sealant. But exposure to some key ingredients in SPF can cause asthma, lung damage, other respiratory problems, skin and eye irritation, and sensitization.

To avoid these harmful effects, workers should wear appropriate personal protective equipment (PPE), and occupants may be asked to vacate the home during and after application for a period recommended by the specific product manufacturer.

Crews and contractors can receive free on-line training at www.spraypolyurethane.org



For large applications, a positive pressure respirator is recommended. This ensures workers get adequate air quality during installation. And if the hood is tucked into the coveralls, it can help keep workers a little cooler when working in hot attics as the fresh outside air flows through the suit.

Lead-based Paint

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Lead-based Paint covers the following:

- Lead-based Paint

According to 1930's advertisements, 8 out of every 10 painters used this brand lead-based paint, but there were plenty of lead paint brands to choose from. Lead paint was valued for it's "stretch-ability", it could be thinned and thinned, and still provide great coverage.

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Lead-based paint is present in much of the housing stock treated by the weatherization network in some parts of the country.

Elevated lead levels in the blood causes neurological damage, and is especially dangerous to children and pregnant women.

Lead-based Paint

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Testing is allowed. • Health and safety funds can be used to cover those costs directly associated with conducting Lead Safe Weatherization (LSW), thus reducing the production costs associated with measures requiring it.
Required	• Follow guidelines established in EPA's Lead; Renovation, Repair and Painting Program (RRP) and DOE WAP's LSW. • Deferral is required when weatherization work could create health and safety hazards due to the extent and condition of lead-based paint in the house. • An EPA Certified Renovator must verify job site set up and clean up. • Grantee Monitors/Inspectors must be Certified Renovators and receive LSW training.
Restricted	• Labor and material costs that would have been conducted anyway, without consideration for LSW, may not be charged to health and safety funds.

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Testing is allowed using EPA approved lead test kits. The included EPA fact sheet describes the kits approved. For up-to-date lists, visit the EPA web site: epa.gov/lead/pubs/testkit

Installers must follow the guidelines of EPA's Lead: Renovation, Repair and Painting Program (RRP), and the DOE WAP's Lead Safe Weatherization (LSW). Where RRP has *de minimus* standards below which RRP is not applicable, LSW must be performed regardless of the square footage being disturbed, but the containment level is less for smaller areas.

Lead-based Paint in the Plan

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

The section on lead-based paint in the H&S Plan must:

- Describe planned implementation of RRP and LSW
- Describe how compliance will be verified
- Show clear understanding of differences between RRP and LSW, and how all protocols will be met

The grantee must explain how it plans to implement and verify compliance with RRP and LSW. The explanation should clearly show an understanding that LSW and RRP are separate requirements and that both protocols must be met.

LSW in Action

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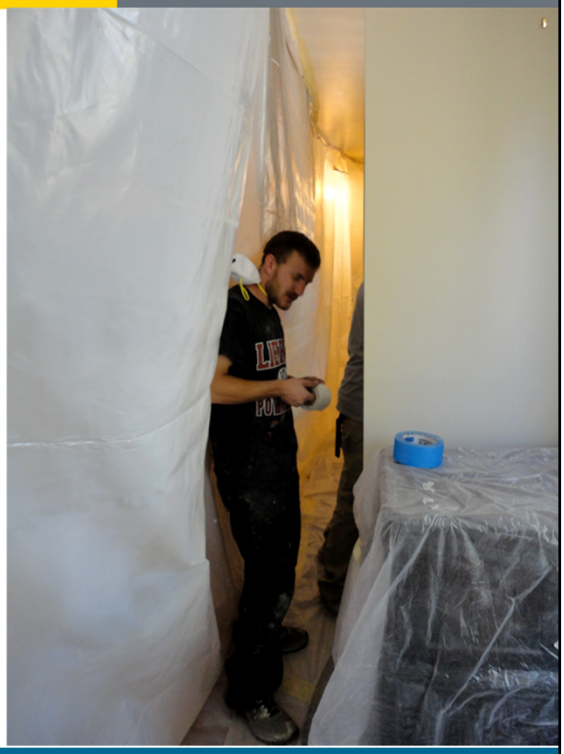
- When performing an interior blow for dense-pack sidewall insulation on a home containing lead paint, containment and proper cleanup is required.
- For exterior jobs, the ground must be covered with 6 mil poly for 10' around the area, and a containment perimeter 10' outside of that established.



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This photo illustrates level II containment by LSW standards. This is also in compliance with RRP rules.

Temporary containment in the form of 6 mil poly has been established surrounding the work area. When the job is complete, installers will follow the guidelines outlined in the EPA's "Steps to Lead Safe Renovation, Repair, and Painting" manual, folding the plastic dirty-side in, taping it closed, and containing it in a sturdy plastic bag.

All containment and disposal procedures are intended to minimize lead dust and thus reduce the chances of adverse effects on the families of clients and workers.

For more on the requirements around lead-based paint, check out the excellent episode of Wx TV dealing with the subject: http://wxtvonline.org/wxtv2/

Mold & Moisture

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Mold & Moisture covers the following:

- Mold and Moisture
- Drainage – gutters, down spouts, extensions, flashing, sump pumps, landscape, etc.

Mold, shown here in a bathroom, may not be removed, but the conditions causing it can be addressed. In this case, adding a bathroom exhaust fan on a timer should improve the situation.

Mold and Moisture covers how we can address mold and moisture, and the drainage issues that cause moisture problems in the home. You should also consider building structure and roofing here, also discussed under Code Compliance, since many of those repairs are related to mold and moisture issues.

Mold & Moisture

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Correction of moisture and mold creating conditions is allowed when necessary in order to weatherize the home and to ensure the long term stability and durability of the measures. • Diagnostics such as moisture meters are recommended pre-weatherization and at final inspection.
Required	• Where severe mold and moisture issues cannot be addressed, deferral is required. • Visual assessment is required. • Provide client notification and disclaimer on mold and moisture awareness. • Staff trained on national mold and moisture curriculum or equivalent.
Restricted	• Mold remediation is not allowed. • Repairs are limited to areas with water damage that can be corrected by weatherization workers. • Mold testing is not an allowable cost.

Mold and moisture are addressed together, because mold will primarily follow moisture, assuming the temperature range is conducive (such as conditioned homes) and a food source is present (mold eats wood, carpet backing, wallpaper glue, the paper on sheetrock, etc.). If we address the moisture problem, the mold will no longer grow. WAP allows the repair of water damaged areas by weatherization workers when it is necessary to perform weatherization. Mold remediation is not allowed. The client should be educated about the health risks and could be given direction on cleaning small areas. Some cleanup is allowed where in contact with a planned measure, such as cleaning mold where a sealant is to be applied.

If severe mold is already present, WAP funds may not be used to mitigate that mold. But where conditions are not so extreme that weatherization cannot proceed, H&S funds may be used to solve the moisture issues leading to mold growth or other moisture-related problems in the home.

Grantees must set guidelines for determining when mold conditions require deferral. Some grantees set a certain square footage of visible mold as the guideline for deferral. For example, you might determine that less than 6 square feet of mold is small enough to allow weatherization of the home and treat the moisture issues causing mold growth. Others subject each instance of mold to a state-level review for consideration.

On page 12 of the template, draft guidelines for addressing mold and moisture. Will you allow repair of minor plumbing leaks? How much mold is too much? Should a grantee-level review be required above a certain cost threshold?

Severe Mold

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Where severe mold and moisture issues cannot be addressed, deferral is required.

Where severe mold is present, deferral is required. We must not tighten up homes and further risk the health and safety of our clients.

Ideally, deferral will be accompanied by a referral – to another program that may be able to help with mold remediation.

Be sure to identify any referral opportunities or requirements in your H&S plan.

Drainage

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Drainage repairs are allowed with health and safety funds only as they relate to code compliance (see code compliance and mold and moisture (see mold and moisture). • A repair is allowed as incidental repair when it is a component of an efficiency measure, as with a French drain when installing an air conditioning system, but must be cost-justified with the ECM(s).
Required	• Inform client of importance of cleaning and maintaining drainage systems and proper landscape design.
Restricted	• Major drainage issues are beyond the scope of the Weatherization Assistance Program.

As stated on the slide, major drainage issues are beyond the scope of the WAP. The grantee must determine what amounts to major issues, and develop guidelines around that in their plan. For example, grading around the exterior of a home may be allowed if it can be done by hand by a few workers, but perhaps work requiring earth movers is considered major, and thereby not allowable.

Refer to page 8 of the template and consider what will work best for your housing stock, while allowing you to administer the program funds and still be able to manage the H&S budget.

Gutters and Downspouts

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

This loose gutter is causing water buildup near the house, which is causing a moisture problem in the basement as the water leaks through the foundation.

This gutter may be reattached and downspouts installed as necessary to relieve the moisture problem and thus maintain the integrity of the home.

Repairing gutters and downspouts is often an easy, inexpensive way to relieve bulk moisture issues.

Outlining which measures can be addressed in the grantee plan helps auditors make good decisions when developing the scope of work for each home.

Mold & Moisture in the Plan

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

The H&S Plan must include:

- Protocols used to identify mold and moisture related issues in client homes
- How these issues are discovered during initial audit/inspection
- Client notification policy
- Expected staff training related to alleviating causes of mold and moisture in the home

The grantee must explain the protocols being used to identify any mold or moisture related issues in the client's home. This should include how mold and moisture issues are discovered during the initial audit or assessment, and client notification procedures. The plan must also indicate how staff will be trained to alleviate limited mold and moisture creating conditions in the home.

Radon covers the following:

- Radon

Both of these homes may have elevated radon levels. Radon presence is not related to income or house size. Radon is an odorless gas released through the soils in certain parts of the country. If radon is present, air sealing the home without addressing the radon can make the problem worse.

Radon is an odorless gas released through the soils in certain geographic regions of the world. When we tighten a home through weatherization, what may have been safe levels of radon in the home could be elevated to unsafe levels due to the decreased dilution with outside air. By making the home tighter and more energy efficient, we may cause adverse health effects if radon and other indoor air quality (IAQ) issues are not measured and addressed.

Radon

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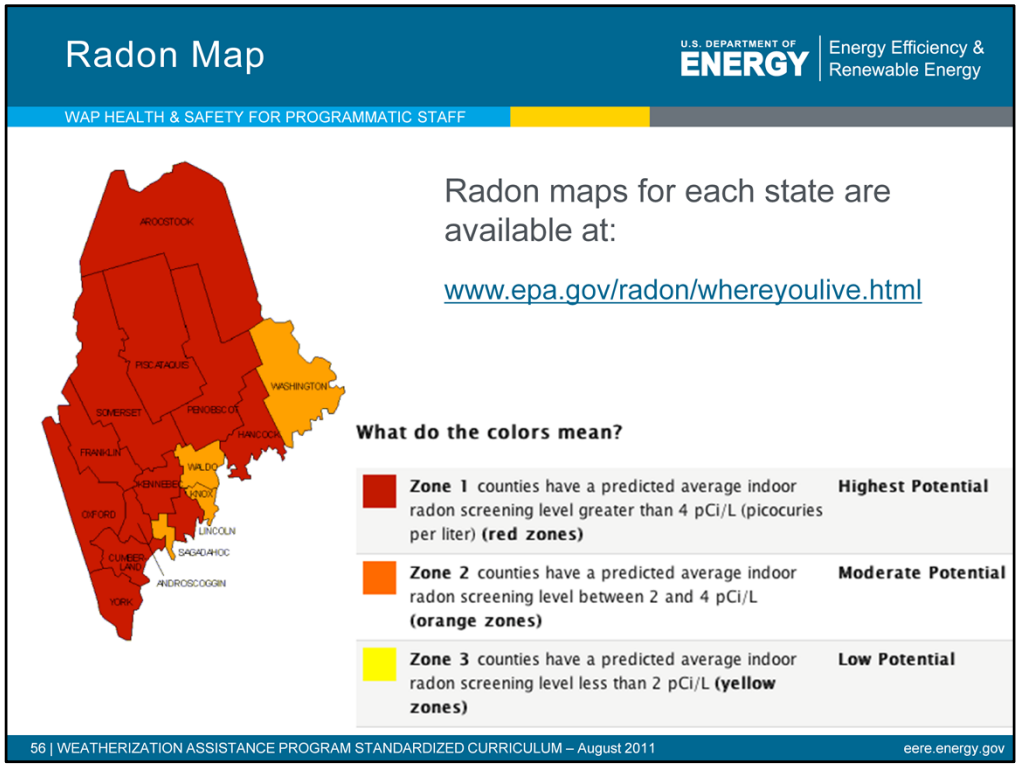
WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Testing is allowed in locations with high radon potential.
Required	• Whenever site conditions permit, exposed dirt must be covered with a vapor barrier, except for mobile homes. • In homes where radon may be present, precautions must be taken to reduce the likelihood of making radon issues worse. • Provide client with EPA consumer's guide to radon.
Restricted	• Radon remediation is not allowed with DOE funds.

Testing to determine radon levels is allowed where there is high radon potential. The EPA's retrofit protocols and radon map are good resources. Several states have also developed their own maps that give more accurate information. If you decide to allow or require testing as part of your health and safety plan, we recommend pre and post-testing so you are assured the weatherization work did not make the radon situation worse in the home.

Radon remediation is not allowed with DOE funds. This issue will be revisited after reviewing the results of the National Evaluation IAQ survey.

Exposed dirt floors must be covered with a sealed vapor barrier to contain soil gases. This is not required under mobile homes.



Radon maps showing risk levels are available for each state on the EPA radon web site.

Insert the appropriate map for the region being trained.

ASHRAE 62.2 for WAP covers the following:

- Ventilation

Installing an oven hood vented to the exterior, like the one shown here, can be covered under health & safety.

ASHRAE 62.2 for WAP covers ventilation.

Ventilation

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• When doing the ASHRAE 62.2 calculations, an infiltration credit based on the anticipated final blower door reading may be applied, reducing the total amount of fan CFM needed for the home.
Required	• 2010 (or most current) ASHRAE 62.2 is required to be met to the fullest extent possible when performing weatherization activity. • Existing fans and blower systems must be updated if not adequate. • To ensure compliance, ASHRAE 62.2 evaluation, fan flow metering, and follow-up testing are required. • Provide client with information on function, use, and maintenance of ventilation system and components. • Include disclaimer that ASHRAE 62.2 does not account for high polluting sources or guarantee indoor air quality. • ASHRAE 62.2 training for weatherization staff.
Restricted	• Installation and repair of ventilation that is a component of an ECM is not allowed as a health and safety cost.

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ASHRAE 62.2 is a ventilation standard developed specifically for small residential structures. The standard contains guidelines for reducing pollutants from adjoining garages, and formulas for determining the amount of mechanical ventilation required to ensure good ***indoor air quality (IAQ)***.

For many grantees, this will require adding more mechanical ventilation to homes than had previously been required in their weatherization program. Auditors and installers may also require training on measuring fan flows, calculating CFM requirements, and installing exhaust fans vented to the exterior.

ASHRAE 62.2 for WAP

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

ASHRAE 62.2 in the H&S Plan:

- Detailed explanation – How will you implement in program year 2012
  - Determine and provide training needs
  - Review audit and work processes for 62.2 incorporation
  - Cost evaluation to justify any increase in requested H&S funds for program year 2012

The grantee must provide a detailed explanation on implementation of ASHRAE 62.2, which will be required for the 2012 program year.

ASHRAE 62.2 will be new to many grantees, and may require substantial training of auditors, crew chiefs and installers.

Auditors and crew chiefs will need to measure existing flow rates and calculate required ventilation rates, and move away from previous concepts like Building Tightness Limits and Air Sealing Targets.

On page 18 in the template, develop language describing how you will ensure adequate training for relevant staff. Will revised air sealing training also be required? If the grantee previously relied on building tightness limits as determined by ASHRAE 62-1989, what will the new air-sealing protocols be? This last issue needn't be addressed here in the plan, but is something you will want to consider as you develop your training plan for the coming program year.

Combustion Appliance Safety and Heating Systems covers the following:

- Combustion Gases
- Solid Fuel Heating – wood stoves, etc.
- Stand Alone Electric Space Heaters
- Unvented Combustion Space Heaters
- Vented Combustion Space Heaters
- Smoke/Carbon Monoxide Alarms & Fire Extinguishers

Combustion Appliance Safety and Heating Systems covers:

- Combustion Gases
- Solid Fuel Heating – wood stoves, etc.
- Stand Alone Electric Space Heaters
- Unvented Combustion Space Heaters
- Vented Combustion Space Heaters
- Smoke/Carbon Monoxide Alarms & Fire Extinguishers

Combustion Gases

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	•Correction of venting is allowed when testing indicates a problem, although this should be done as an incidental repair when it is a component of an ECM.
Required	•Proper venting to the outside for combustion appliances, including gas dryers, is required. •Combustion safety testing is required when combustion appliances are present. •Inspect venting of combustion appliances and confirm adequate clearances to combustibles. •Test natural draft appliances for draft and spillage under worst case conditions before and after air sealing. Inspect cooking burners for operability and flame quality. •Provide client with combustion safety and hazards information, including the importance of using exhaust ventilation when cooking and the importance of keeping burners clean to limit CO production.
Restricted	•Replacement of cook stoves is not allowed, repair is allowed.

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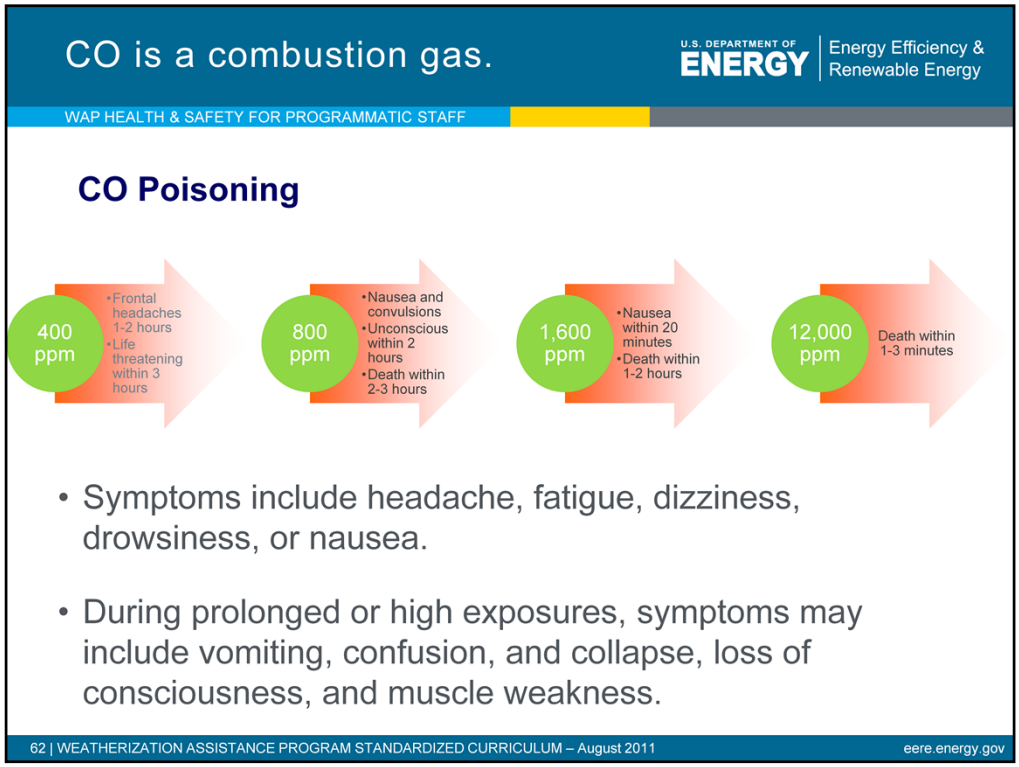
When testing indicates a problem, venting systems may be corrected to ensure the safe exhaust of combustion gases. However, if the heating system is being replaced as an ECM, alterations to the venting system should be included in the SIR as part of the ECM.



The most dangerous combustion gas commonly encountered in weatherization is carbon monoxide (CO). CO is an odorless, colorless byproduct of combustion that can lead to CO poisoning if present in ample quantities.

Symptoms of CO poisoning include headache, fatigue, dizziness, drowsiness, and nausea. During prolonged or high exposures, symptoms may worsen and include vomiting, confusion, and collapse, in addition to loss of consciousness and muscle weakness.

Combustion Gases in the Plan

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

The grantee must provide an explanation of procedures to be followed when problems are discovered during testing of combustion gases.

Suggest including:

- Description of test procedures, to ensure consistent meaning of results
- Action levels for draft, CO, and stack temp. for commonly-encountered appliances
- Action required

Combustion Analyzer
Bacharach, www.bacharach-inc.com/fyrite-tech.htm

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The grantee must provide an explanation of procedures to be followed when problems are discovered during testing of combustion gases.

Refer to page 8 of the template and draft language describing protocols.

- What are the approved test procedures to determine whether there is a problem?
- What level of CO in the home requires action? What about draft?
- What corrective actions are required? What follow-up testing should be done to confirm positive results, and how should this be documented?

Solid Fuel Heating

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Maintenance, repair, and replacement of primary indoor heating units is allowed where occupant health and safety is a concern. • Maintenance and repair of secondary heating units is allowed.
Required	• Inspection of chimney and flue, and worst-case combustion appliance zone depressurization testing.
Restricted	• Replacement of secondary heating units is not allowed.

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All indoor solid fuel heating units, like wood stoves and pellet stoves, may be maintained and repaired. Primary units can also be replaced if warranted by health and safety concerns, but secondary heating units may not be replaced.

Testing required by this guidance includes:

- Inspection of chimney and flue
- Worst-case combustion appliance zone (CAZ) depressurization testing

On page 15 of the template, develop guidance for when a heating system may be replaced as a H&S measure. How should local agencies determine whether repair, maintenance, or replacement is preferable? Some plans require that auditors compare the cost of repair/maintenance to replacement, and if replacement is less than X% more expensive than repair, the unit is replaced. This can ensure longevity of the system while maintaining cost controls. Cost controls such as these can be considered for other measures as well in order to manage the H&S budget.

Stand Alone Electric Space Heaters

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Removal is recommended.
Required	• Check circuitry to ensure adequate power supply for existing space heaters. • Inform client of hazards and collect a signed waiver if removal is not allowed.
Restricted	• Repair, replacement, or installation is not allowed.

Stand alone electric space heaters may not be repaired, replaced, or installed with WAP funds. Removal is recommended.

If the client won't allow removal, a signed waiver must be collected and saved in the client file.

Unvented Combustion Space Heaters

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• If used as primary heat source, replacement with an approved heating system is allowed. • Testing for air-free carbon monoxide (CO) is allowed. • Repair of secondary units that conform to ANSI Z21.11.2 is allowed.
Required	• Units that do not meet ANSI Z21.11.2 must be removed prior to weatherization, but may remain until a replacement heating system is in place. • Check units for ANSI Z21.11.2 label. • Inform client of dangers of unvented space heaters - CO, moisture, and NO2. CO can be dangerous even if CO alarm does not sound.
Restricted	• Installation is not allowed. • Replacement of secondary heat sources is not allowed.

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Any unvented combustion space heaters that do not have the ANSI Z21.11.2 label must be removed before weatherization can proceed on a home, regardless if it is the primary heat source or a secondary heat source. The unit may stay in place until an approved replacement heating system is functioning, then weatherization may proceed. Replacement should be considered as an ECM and shown not to be cost effective prior to using H&S funds.

If a secondary unvented heater conforms with the ANSI standard, it may be repaired as necessary with H&S funds.

If unvented space heaters will remain in the home, inform clients of the risks.

Refer to the included OSHA “Carbon Monoxide Quick Card” as a possible client education material.

Refer to page 16 of the template and draft language describing your policy on unvented space heaters. What test procedures will be required to determine whether secondary, ANSI-compliant units need repair? For primary heat sources, what type of heating systems will they be replaced with?

Unvented Space Heater

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

This unvented space heater does not conform to ANSI Z21.11.2. This must be removed before weatherization can occur on the house.

If this were the primary heat source, it could be left in place until another heat source was installed, then weatherization would proceed.

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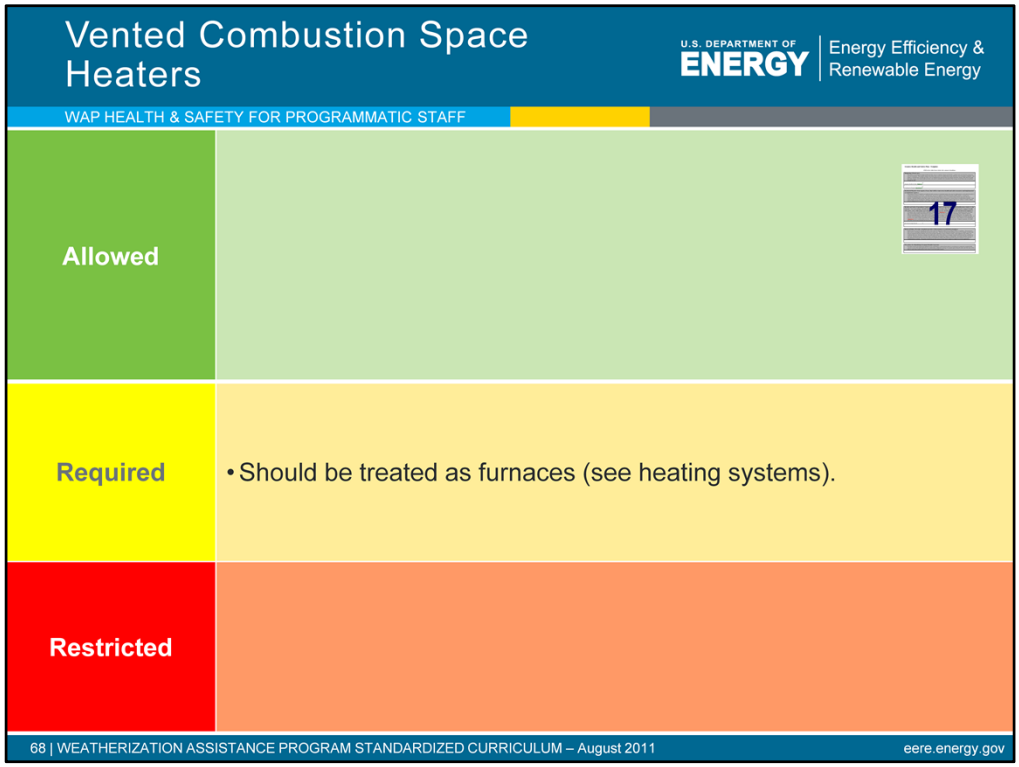
Unvented combustion space heaters dump all of the combustion byproducts, including carbon monoxide and moisture, into the home. Though it might not have caused harm before, after tightening the home through proper weatherization, those byproducts can easily reach harmful levels. Moisture will lead to mold and building degradation. CO will cause illness, damage the brain, and can be lethal.

For these reasons, unvented space heaters that do not conform to the ANSI standard must be removed before weatherization can proceed. One of the guiding principles of WAP is, “Do no harm.”



Vented combustion space heaters should be treated the same as furnaces are treated in your program, following the same testing, repair, and replacement protocols.

Smoke/Carbon Monoxide Alarms and Fire Extinguishers

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Installation of smoke/CO alarms is allowed where detectors are not present or are inoperable. • Inoperable smoke/CO alarms can be replaced if required as condition of local code compliance (see code compliance). • Providing fire extinguishers is allowed only when solid fuel is present.
Required	• Provide client with verbal and written information on use of smoke/CO alarms and fire extinguishers when installed.
Restricted	• Replacement of operable smoke/CO detectors is not an allowable cost, except where required by local code compliance. • Installing fire extinguishers is not allowed, unless solid fuel appliances are present.

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When a home does not have operable smoke or CO alarms, they may be installed with H&S funds. Fire extinguishers may be installed where solid fuels are present, fireplaces or wood stoves, for example.

Smoke and CO Alarms in the Plan

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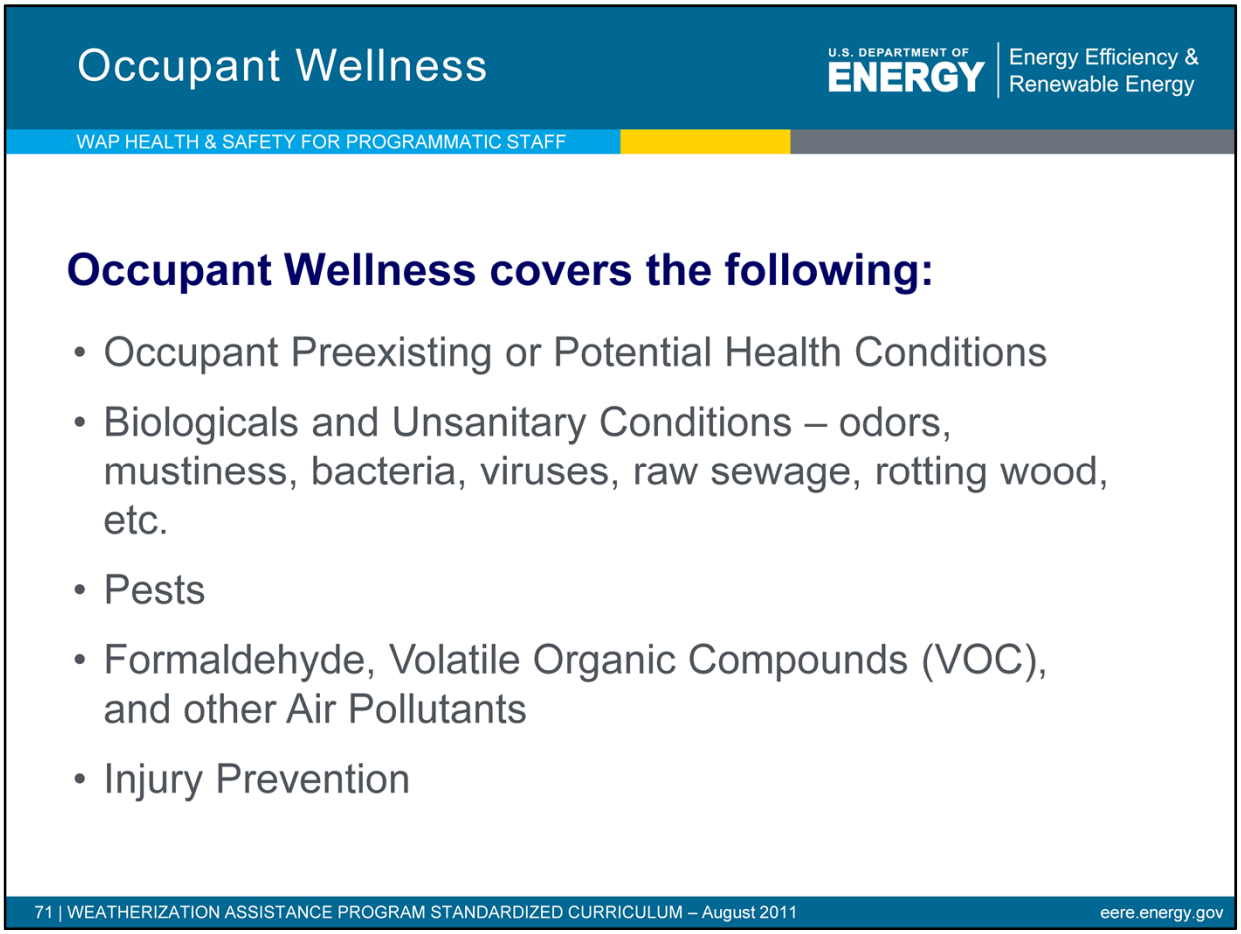
WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Detailed implementation plan

- Installation parameters:
  - If non-functioning or nonexistent, is replacement required by grantee?
- Installation procedures:
  - Specifications dictated by grantee?
  - Installation guidelines to ensure units serve purpose.

The grantee must provide a detailed explanation on implementation of smoke and/or carbon monoxide alarm installation parameters and procedures.

Refer to page 15 of the template and draft some language for the plan. Will you require installation of smoke/CO alarms in the plan? If so, what are the installation guidelines? What is the required sensitivity for the CO detectors? Determine how much guidance your local agencies will need to help them choose the right course of action – to install or replace; which model to buy, where to install – and provide that level of clarity in the plan.



Occupant wellness is the last of the "bins" of issues covered by WPN 11-6, and it covers the following topics:

- Occupant Preexisting or Potential Health Conditions
- Biologicals and Unsanitary Conditions – odors, mustiness, bacteria, viruses, raw sewage, rotting wood, etc.
- Pests
- Formaldehyde, Volatile Organic Compounds (VOC), and other Air Pollutants
- Injury Prevention

Occupant Preexisting or Potential Health Condition

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Allowed	• Temporary relocation of at-risk occupants may be allowed on a case-by-case basis.
Required	• When a person's health may be at risk and/or the work activities could constitute a health or safety hazard, the occupant at risk will be required to take appropriate action based on severity of risk. • Failure or the inability to take appropriate actions must result in deferral. • Grantees must require occupant to reveal known or suspected health concerns as part of initial application for weatherization. • Occupants must also be screened for known or suspected health concerns during the initial home audit. • Provide client information of any known risks to their condition. • Provide client with worker contact information so client can inform of any issues.
Restricted	Weatherization may not proceed if the occupant cannot or will not take appropriate actions based on the severity of the risk.

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When a person's health may be at risk as a result of weatherization activities, temporary relocation of the occupant may be necessary. Most commonly, asthma or other respiratory conditions are of greatest concern, as installing insulation and other weatherization work tends to increase the level of airborne particulates during and shortly after weatherization.

The grantee must develop procedures for soliciting information from clients to reveal known or suspected occupant health concerns as part of the initial application for weatherization. This could be a survey added to the application. During the energy audit, the auditor will perform additional screening, comparing the original documentation, to determine what steps will be taken to ensure that weatherization work will not worsen the client's health condition. This double-checking helps ensure we capture and document any health concerns by giving the occupant additional time to consider any pre-existing conditions they may have.

Occupant Health Concerns in the Plan

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

In the Plan:

- Policy to determine existing health conditions of occupants
- Documentation for notifying clients of potential health concerns. Concerns might include:
  - Mold discovered in bedroom
  - Unsafe electrical wiring not covered by WAP H&S

The screening policy must be described in the plan. If the policy exists in the grantee policy and procedures manual, reference that in the plan.

The grantee must also develop documentation forms that include the client's name and address, dates of the audit/assessment and when the client was informed of a potential health and safety issue, a clear description of the problem, a statement indicating conditions under which weatherization could continue, the responsibility of all parties involved, and the client(s) signature(s) indicating that they understand and have been informed of their rights and options.

Refer to the included Mold Notification and Release Forms as examples of client notification about potential H&S issues. The form may include notice of deferral, or may simply provide space for clients to release the agency from responsibility for future problems associated with this pre-existing condition in the home.

Biological and Unsanitary Conditions

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Remediation of conditions that may lead to or promote biological concerns and unsanitary conditions is allowed when necessary to perform weatherization or if those conditions were a result of weatherization. (also see mold and moisture) • Deferral may be necessary in cases where a known agent is present in the home that may create a serious risk to occupants or weatherization workers.
Required	• Inform client of observed conditions. • Provide information on how to maintain a sanitary home and steps to correct deferral conditions. • Sensory inspection.
Restricted	• Addressing bacteria and viruses is not an allowable cost. • Cleaning or repairing conditions other than those that may lead to or promote biological concerns and/or are not necessary to perform weatherization is not allowed.

Conditions that may lead to or promote biological concerns or unsanitary conditions may be remediated with H&S funds when necessary to conduct weatherization measures.

Where a serious risk is present that cannot be properly treated, deferral may be necessary.

Whether your are addressing the biological creating conditions and weatherizing, or deferring the home, the client must be informed of the observed health concerns.

Pests

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Pest removal is allowed only where infestation would prevent weatherization. • Screening of windows and points of access to prevent intrusion is allowed.
Required	• Infestation of pests may be cause for deferral where they cannot be reasonably removed or the infestation poses a health and safety concern for workers. • Assessment of presence and degree of infestation and risk to worker. • Inform client of observed condition and associated risks.
Restricted	• Removing pests that would not otherwise prevent the workers ability to weatherize the home or protect weatherization measures.

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Pest removal is allowed where necessary to perform weatherization.

Pest exclusion through screening points of access is an allowable H&S expense. When air sealing, stuffing steel wool or copper scrub pads into the voids before applying spray foam prevents rodents from chewing through the foam and accessing the living quarters.

Refer to page 13 of the template and draft some language for the H&S plan. Will pest exclusion be allowed? Required? What level of infestation will lead to deferral?

- These little pests had to be removed before heating system testing and repair could be conducted. This was an allowable health and safety expense. Most pest infestations are not so adorable.
- Animals love chimneys because they provide warmth and protection from the elements. There are many stories of animals dying in chimneys from intense heat or CO poisoning. The deceased animal can cause a blockage in the vent system.
- Yes, believe it or not, a baby Mallard duck was found in a chimney by Tom Boothby in Maine. (The clean-out door was in good shape.) Tom removed the duck and put it back outdoors.

Formaldehyde, VOCs, & Other Air Pollutants

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Removal of pollutants is allowed where necessary to perform weatherization.
Required	• Removal of pollutants is required if they pose a risk to workers. • If pollutants pose a risk to workers and removal cannot be performed or is not allowed by the client, the unit must be deferred. • Sensory inspection. • Inform client of observed condition and associated risks. Provide client written materials on safety and proper disposal of household pollutants.
Restricted	Removal of pollutants that is not necessary to perform weatherization (e.g. cleaning old paint cans and oil out of the garage) is not allowed.

Indoor pollutants may be removed with H&S funds where necessary to perform weatherization.

If the pollutants will not pose a health risk after weatherization, and removal is not required in order to perform weatherization, their removal may not be charged to the H&S budget.

Injury Prevention

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

Allowed	• Minor repairs and installation may be conducted only when necessary to effectively weatherize the home.
Required	• Workers must take all reasonable precautions against performing work on homes that will subject workers or occupants to health and safety risks. In other words, work safe. • Observe if dangers are present that would prevent weatherization. • Inform client of observed hazards and associated risks.
Restricted	• Minor repairs and installation of items such as stairs, porches, safety lighting, hand rails, etc. are not allowed unless their absence would prevent the effective weatherization of the home.

Minor repairs may be done with H&S money only when those repairs are necessary for the effective weatherization of the home.

An example of this might be replacing a loose or missing stair tread on a set of basement stairs. If basement insulation, air sealing, or some other weatherization measure is being installed which requires safe and repeated access to the basement, the stair may be repaired with H&S funds. On the other hand, if no weatherization measures are being installed that require access to the basement, that stair could not be repaired with H&S funds.

Clients should always be informed in writing of observed hazards and their risks. Always get the notifications signed and keep a copy in the client file.

Summary

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WAP HEALTH & SAFETY FOR PROGRAMMATIC STAFF

- WPN 11-6 provides guidance on what is allowable, what is required, and what is restricted for most health and safety concerns encountered through weatherization.
- The grantee health and safety plan will provide further guidance.
- The grantee's plan may choose not to allow something that is allowed by WPN 11-6, but it must adhere to required actions and restrictions.
- If a measure is identified as incidental repair in the H&S plan, that definition must be consistently applied throughout the program.

In summary:

- WPN 11-6 provides guidance on what is allowed, required, and restricted for most health and safety issues encountered through weatherization.
- The grantee H&S plan will provide further guidance to the local agencies that carry out the work. Where WPN 11-6 allows flexibility, tailor your H&S plan to best serve your clients and housing stock.
- The grantee may decide something allowed by WPN 11-6 doesn't make sense for their program and choose not to allow the measure in their plan. WPN 11-6 requirements and restrictions must be upheld at the grantee level and carried over to their H&S plans.
- Definitions of incidental repairs must be applied consistently throughout the grantee's service territory.