



Guidelines for Home Energy Professionals: 2014 Standard Work Specifications (SWS) Maintenance Summary Report

Guidelines for Home Energy Professionals Project

Rachel Romero and Chuck Kurnik

National Renewable Energy Laboratory (NREL)

July, 2014

Acronyms

ACI	Affordable Comfort Institute
BPI	Building Performance Institute
DOE	U.S. Department of Energy
NREL	National Renewable Energy Laboratory
RFI	Request for Information
SME	Subject matter expert
SWS	Standard Work Specification
WAP	Weatherization Assistance Program

Executive Summary

The U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) and the National Renewable Energy Laboratory (NREL) established the Guidelines for Home Energy Professionals project to support and promote high-quality work in the weatherization and home energy upgrade industry. A major component of the Guidelines effort is to define high-quality work through Standard Work Specifications (SWS) for single-family, multifamily, and manufactured housing energy upgrades.

A primary objective of the Guidelines project is to provide consensus-based SWS in accordance with industry best practices. Collaboration with industry throughout the SWS development process promoted consensus across the WAP network and private industry. This collaboration was accomplished through the involvement of public, private, and federal sector subject matter experts; feedback was obtained through a multistage, iterative stakeholder engagement process.

To ensure the SWS continue to be consensus-based, centralized resources for promoting best practices and maintaining consistency throughout the home performance industry, an SWS maintenance committee will inform regular revisions of the SWS in accordance with current home performance industry best practices.

An executive committee and four subcommittees annually complete the maintenance of the SWS for DOE and SWS users. The subcommittees include subject matter experts for specific SWS sections.

The subcommittees and executive committee met for the inaugural, 2014 SWS maintenance event the week of April 28, 2014, in Detroit, Michigan. The event date was chosen to be in conjunction with the Affordable Comfort Institute's Annual Conference. This report details the preparation for and the outcome of those meetings.

The NREL team publicized the request for comments, as well as a request for committee members. The SWS were divided into four subject areas to be addressed by four committees. The subject areas and number of comments received are shown below.

Subject Area	Number of Comments
Air Sealing & Insulation	55
Baseload	20
Health & Safety	85
Heating, Cooling, and Ventilation	27
Total	185

Comment adjudication results:

- Accepted: 51
- Accepted with modifications: 36
- Further investigation required: 19
- Rejected: 81

From the SWS maintenance committee members and NREL staff team, the following major themes and lessons learned were discussed and recorded here to improve the SWS and future committee meetings.

Major themes:

- **Combustion testing:** Discussions are underway among industry stakeholders about this topic. The Building Performance Institute BPI-1200 standard is referenced in the SWS and is currently under revision. As a result, there is confusion around some details in the SWS. The SWS will be updated as these discussions are resolved.
- **Crosswalk between housing types:** The executive committee recommended a crosswalk between the three housing types in the SWS to find and correct conflict to ensure consistency between housing types.

Major lessons learned:

- **Working with committees:** In the future, the committee will review comments earlier in the process. This will ensure that the committees are better prepared for the in-person meeting.
- **Update to comment tool:** Based on the quality of comments received, the team is updating the comment tool. The update will provide additional guidance to commenters so their comments are easier to interpret by the committees.

Overall, it was a very successful event, and we are confident that it will be even more successful in the future.

Contents

1	Introduction	1
1.1	What Are the Standard Work Specifications?	1
1.2	Maintaining the Standard Work Specifications	1
1.3	Purpose of This Report	1
2	Public Outreach and Transparency	2
2.1	Requests for Committee Members	2
2.1.1	Request for Information	2
2.2	Request for Comments	3
3	Summary of Committee Members	4
3.1	Selection of Committees	4
3.2	Committee Members	4
3.2.1	Health & Safety Committee	4
3.2.2	Air Sealing & Insulation Committee	5
3.2.3	Heating, Cooling, and Ventilation Committee	5
3.2.4	Baseload Committee	5
3.2.5	Executive Committee Members	5
3.2.6	Scribes	5
4	Comments and Their Resolutions	7
4.1	Submitted Comments	7
4.2	Comment Resolutions	8
4.2.1	Comment Spreadsheet	9
4.3	Comment Quality	9
4.4	Interpretation and Application of the Standard Work Specifications	9
4.5	Combustion Appliance Zone Testing	10
4.6	Crosswalk Between Housing Types	10
4.6.1	Installing Insulation	10
5	Lessons Learned	11
5.1	Meeting Preparation	11
5.1.1	Selecting Subject Matter Experts	11
5.1.2	Working With Committee Chairs	11
5.1.3	Working With Committee Members	11
5.1.4	Working With Event Venue and Conference Organizer	11
5.1.5	Comment Deadline	11
5.2	Committee Meetings	12
5.2.1	Physical Documents Versus Digital Documents	12
5.2.2	Access to References	12
5.2.3	Limit the Number of Comments To Review	12
5.2.4	In-Person Meetings	12
5.2.5	Executive Committee Meeting	12
5.2.6	Code Versions and Updating the Standard Work Specifications	12
5.3	Closeout of Committee Meetings	13
5.3.1	Post-Meeting Work	13
5.3.2	Outreach About Updates to the Standard Work Specifications	13
	Appendix	14

1 Introduction

The U.S. Department of Energy (DOE) Weatherization Assistance Program (WAP) and the National Renewable Energy Laboratory (NREL) established the Guidelines for Home Energy Professionals project (the “Guidelines” project) to support and promote high-quality work within the weatherization and home energy upgrade industry. A major component of the Guidelines effort is to define high-quality work through Standard Work Specifications (SWS) for single-family, multifamily, and manufactured housing energy upgrades.

1.1 What Are the Standard Work Specifications?

The SWS for single-family, multifamily, and manufactured housing energy upgrades define the minimum acceptable outcomes for any weatherization or home performance task to be effective, durable, and safe.

1.2 Maintaining the Standard Work Specifications

A primary objective of this project is to provide consensus-based SWS in accordance with industry best practices. Collaboration with industry throughout the SWS development process promoted consensus across the WAP network and private industry. This collaboration was accomplished through the involvement of public, private, and federal sector subject matter experts (SMEs); feedback was obtained through a multistage, iterative stakeholder engagement process.

To ensure the SWS continue to be consensus-based, centralized resources for promoting best practices and maintaining consistency throughout the home performance industry, an SWS maintenance committee will inform regular revisions of the SWS in accordance with current home performance industry best practices. To learn more about the SWS maintenance process, refer to the Guidelines for Home Energy Professionals: [Standard Work Specifications \(SWS\) Maintenance Charter](#).

The SWS maintenance event is a meeting of the executive committee and the subcommittees to review comments for the SWS. The subcommittees include SMEs for specific SWS sections. The subcommittees’ role is to adjudicate comments received in the comment review period that occurred before an SWS maintenance event. Subcommittee members discuss and determine a response to each comment received during the SWS maintenance event. The subcommittees are responsible for revising the technical content of each SWS section and relevant addenda. To learn about the specific procedures of the maintenance committees, refer to the Guidelines for Home Energy Professionals: [Standard Work Specifications \(SWS\) Maintenance Procedures](#).

1.3 Purpose of This Report

This report summarizes and provides a record of the activities at the maintenance event and the adjudication of the comments for DOE, the committee members, and SWS users. The report also informs future maintenance committee meetings for project management.

2 Public Outreach and Transparency

Because the SWS are collaborative documents, communicating maintenance activities to all stakeholders is critical. Revisions require effective communication of comment deadlines, text changes, and plans for revisions.

To start the SWS maintenance event, two documents were made available on the SWS website's [About](#) page:

- December 4, 2013: SWS Maintenance Charter, which discusses the SWS maintenance process.
- February 3, 2014: SWS Maintenance Procedures, which describes the procedures used during committee meetings.

The project employs two methods of communication for SWS users:

- GovDelivery announcements arrive via email; users can subscribe at [Guidelines for Home Energy Professionals](#) project page.
- SWS News Items under "[News & Updates](#)" are listed on the SWS home page for users to review. These items remain in the queue as a history and record for all site visitors.

NREL continues to conduct outreach via these two methods.

2.1 Requests for Committee Members

Committees were assembled to ensure collaboration and industry consensus when the SWS are changed as a result of the comments submitted. The following announcements were made.

SWS News Item:

- December 3, 2013: Now Accepting Applications for SWS Maintenance Committees.

GovDelivery announcements sent:

- December 17, 2013: Now Accepting Applications for SWS Maintenance Committees
- January 8, 2013: Deadline for SWS Maintenance Committees is Friday, January 10, 2014.

The information was also sent in December 2013 to applicable industry groups. In the Appendix, the outreach strategy describes the other groups that received a request to distribute the call for applications for committee member selection.

2.1.1 Request for Information

A Request for Information (RFI) for committee member applications was also made available on the [Federal Business Opportunities: Notices](#) site. The RFI requested applicants for the SWS maintenance committees and included information to find the application and review the SWS maintenance charter at the SWS site.

- December 16, 2013: RFI opened
- January 1, 2014: RFI closed.

2.2 Request for Comments

Comments were solicited from industry and SWS users about the revisions that should be made to the SWS. Comments were accepted via email since the April 2013. On February 24, 2014, the SWS commenting tool was launched. Along with the tool, the deadline of April 21, 2014 close of business deadline for the comments to be submitted for the first round of maintenance was announced.

SWS News Items:

- February 6, 2014: NREL Seeking Comments on the SWS
- February 24, 2014: SWS Commenting Tool Now Available
- April 10, 2014: SWS Maintenance Committees to Convene at the 2014 ACI National Home Performance Conference.

GovDelivery Announcements sent:

- March 3, 2014: Quality Work Plan Resources, SWS Field Guide Template and Commenting Feature Now Available
- March 25, 2014: Submit Your Comments to the SWS by April 21, 2014
- April 17, 2014: Last Chance: Submit Your Comments to the SWS by April 21, 2014

The event and the SWS commenting tool were also publicized on the Affordable Comfort Institute (ACI) Conference site starting on March 20, 2014 through the conference close. See the Appendix for the page.

3 Summary of Committee Members

Fifty people applied to participate in the SWS maintenance committees.

3.1 Selection of Committees

The Guidelines team at NREL vetted all applicant resumes for expertise in the field of residential home energy upgrades. Candidates were quantitatively ranked based on the following criteria:

- Experience within weatherization programs
- Previous involvement with the Guidelines project
- Holding a Guidelines certification
- Registration on the SWS tool
- Holding related professional credentials
- Ability to attend the ACI conference.

Chairs were selected based on their leadership experience. The highest ranked candidates were then assigned to committees by their experience within topics (Health & Safety; Air Sealing & Insulation; Heating, Cooling, and Ventilation; and Baseload). Some members with multifamily experience were selected for all committees to ensure these interests were well represented. Regional and organizational diversity were ensured by limiting the number of committee members from each state and by limiting each employer to one representative on each committee.

Applicants were notified February 12, 2014 of acceptance onto the committees. Applicants who were not selected for committee participation were notified on February 26, 2014.

For the first maintenance event, committee members were required to attend in person. As the event approached, several members declined to attend. The lists below reflect the final committee members who participated on the committees.

3.2 Committee Members

Committee members are listed with their affiliation in alphabetical order. Chairs are denoted.

3.2.1 Health & Safety Committee

Jonathan Coulter, Advanced Energy

Paul Francisco, University of Illinois—Illinois Sustainable Technology Center

Chris Jones (Chair), Greater Cincinnati Energy Alliance

Scott Kashuba, State of Ohio Weatherization

Randall Olsen, Community Action Organization

Brad Turner, Southface Energy Institute

3.2.2 Air Sealing & Insulation Committee

Sean Bleything, Vermont Energy Investment Corporation
Bryan Burris, Virginia Department of Housing & Community Development
Kelly Cutchin, Simonson Management Services
Thom Knoll, Self-employed consultant
Tony Link (Chair), State of Wisconsin
Bob Pfeiffer, Wisconsin Energy Conservation Corporation
John Porterfield, eZing, Inc

3.2.3 Heating, Cooling, and Ventilation Committee

Mark Bergmeier, Iowa Weatherization Program
Anthony Cox, Community Housing Partners
Bruce Manclark, Clearesult
Stephen Christensen, DeCiBeL Energy
Don Prather, Air Conditioning Contractors of America
Paul Raymer (Chair), Heyoka Solutions, LLC
Adam Romano, Association for Energy Affordability, Inc.

3.2.4 Baseload Committee

Chris Baker (Chair), Foundation for Senior Living/Southwest Building Training Center
David Mountin, TRC Energy Services
Glen Salas, Simonson Management Services

3.2.5 Executive Committee Members

Per the SWS Maintenance Charter, the Executive committee consists of the committee chairs and the DOE representative, Josh Olsen. The executive committee convened to summarize actions to be taken and discuss major crosscutting issues in the SWS.

Chris Baker, Foundation for Senior Living/Southwest Building Training Center
Chris Jones, Greater Cincinnati Energy Alliance
Tony Link (Chair), State of Wisconsin
Josh Olsen, DOE
Paul Raymer, Heyoka Solutions, LLC

3.2.6 Scribes

The following NREL staff acted as scribes for the committee meetings:

Health & Safety and Executive Committee: Chuck Kurnik

Air Sealing & Insulation: Stephen Lommele

Heating, Cooling, and Ventilation: Heather Head

Baseload: Deb Lastowka

Executive Committee: Rachel Romero

4 Comments and Their Resolutions

Committees convened on Monday, April 28, 2014 at the Cobo Center in Detroit, Michigan at 9:00 a.m. for an introductory session before splitting into individual committees. The executive committee convened on Friday, May 2, 2014 at the Detroit Renaissance Marriott at 8:30 a.m. to review comment conflicts, crosscutting issues, and general comments.

All meeting minutes from the committee meetings are in the Appendix.

The Health & Safety committee did not resolve all the comments under the topic on April 28, so a webinar was held on May 7 for 2.5 hours to conclude.

4.1 Submitted Comments

One hundred eighty-seven comments were submitted by 32 commenters, and several general comment emails were submitted to the Workforce Guidelines address. Comments were categorized as follows:

- Health & Safety: 85
- Air Sealing & Insulation: 55
- Heating, Cooling, and Ventilation: 27
- Baseload: 20.

Of the 187 comments, nine were on the manufactured housing SWS, 13 on the multifamily SWS, and the remaining pertained to the single-family SWS. As shown in

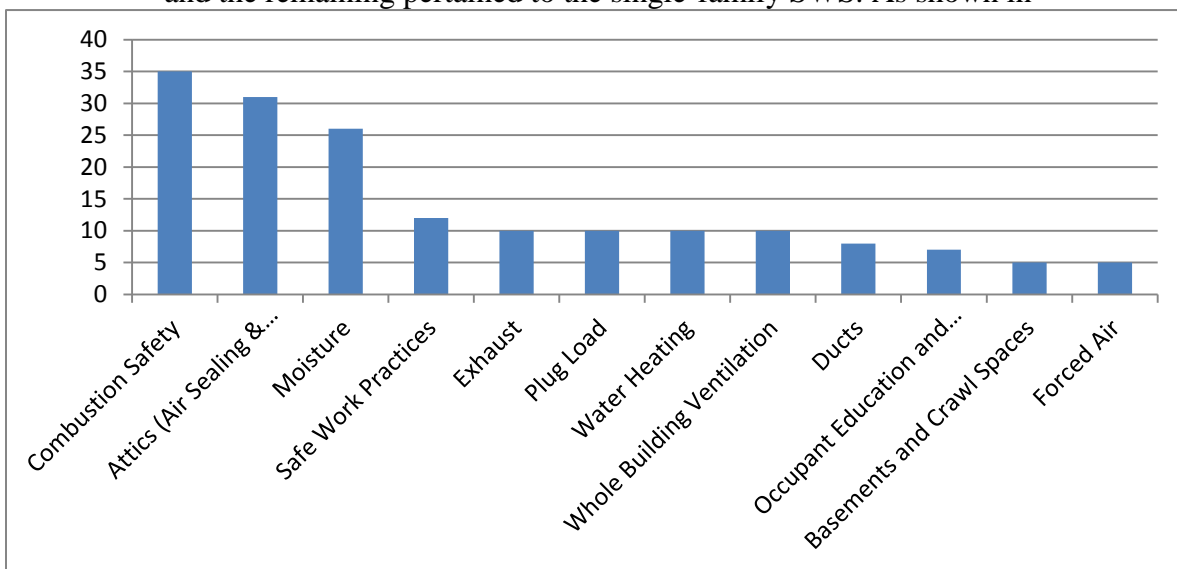


Figure 1, most comments were under the topic of combustion safety (topics with two or fewer comments are not shown).

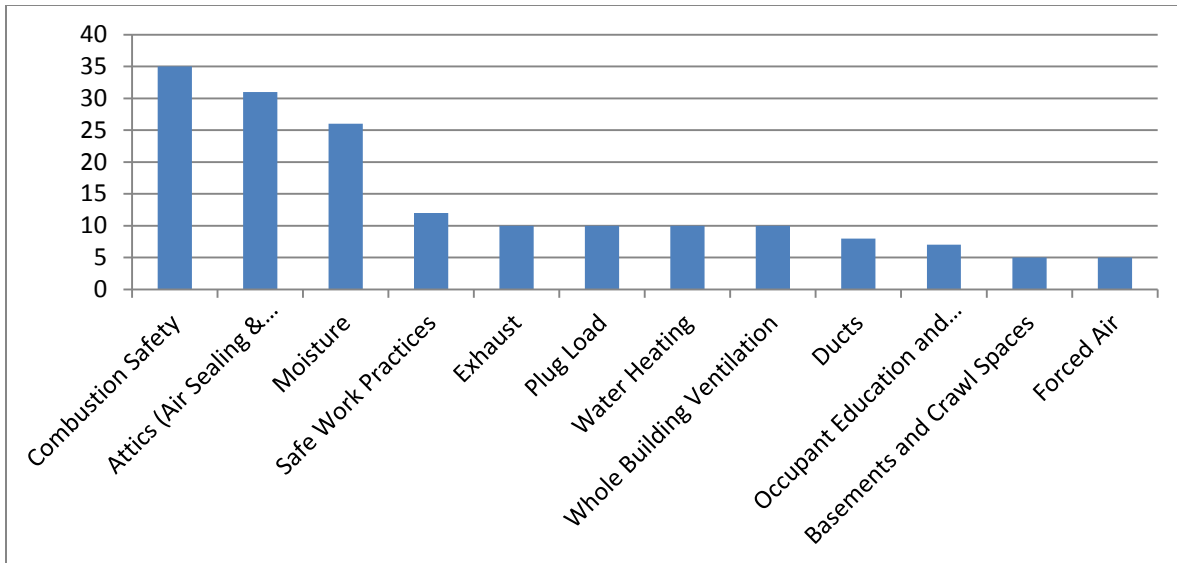


Figure 1. Comments by SWS topic

Four emails were submitted with general comments to the Workforce Guidelines email address. Those comments can be reviewed in the Appendix.

4.2 Comment Resolutions

The committees responded to all 187 comments with one of the four following designations:

- Accepted: Comment is accepted as submitted.
- Accepted with modification: The comment was accepted with some revisions.
- Further investigation required: Sufficient information was not provided, the committee did not reach consensus, or further research was required to respond to the comment. Comments with this designation will be reviewed at the next committee meeting to see if new resolutions have been found.
- Rejected: The comment does not apply, is wrong, or has poor justification.

Of the comments reviewed, the final adjudications resulted in the following:

- Accepted: 51
- Accepted with modifications: 36
- Further investigation required: 19
- Rejected: 81.

All comment responses and rationales for adjudications are included in the comment spreadsheet at: <https://sws.nrel.gov/maintenance>.

Some comments prompted modifications in other sections of the SWS and are noted in the spreadsheet. General comments are included in the Appendix.

Several comments also affected the information in SWS Appendix A: Supplemental Ventilation Information; the language was edited to be more consistent with the ASHRAE Standard 62.2.

Although most comments were resolved, many remain with the designation of “Further investigation required.” For the comments about combustion safety, see Section 4.5, “Combustion Appliance Zone Testing.” All other comments with this designation will be reviewed at the next maintenance event.

4.2.1 Comment Spreadsheet

The comment spreadsheet gives each specific comment submitted and its resolution. A rationale for the committee’s decision is provided for all comments except for those that were accepted. The spreadsheet also indicates the change in language when the committee’s decision resulted in a change to the specification.

4.3 Comment Quality

One of the biggest hurdles met by the committees was the ambiguous, incomplete, or irrelevant information in many comments. Committees were often unable to move forward with a solution without additional information, especially when no actionable recommendations were provided. Some comments were requests for interpretations of the SWS, for which the committees are not responsible. For these reasons, many comments were rejected. Commenters are advised to resubmit comments to correct for misinterpretations, clarity, etc.

To improve comment quality, the SWS comment feature was enhanced to require additional information. Please see more information about the comment tool at <https://sws.nrel.gov/help#comment>.

4.4 Interpretation and Application of the Standard Work Specifications

During the review of the comments, the committees struggled with the purpose and the interpretation of the SWS. Discussions revolved around several ideas:

- Weatherization network versus industry application: The weatherization network has best practices for performing work that may or may not apply to industry. The SWS applies to the entire home performance industry and weatherization work.
- Cost-effective measures versus best practices: Cost effectiveness is not always the most important factor; sometimes comfort, safety, or other factors have a higher priority.
- Completing every SWS detail: If an auditor specifies a required SWS detail, the worker needs to achieve the outcomes of that detail rather than every detail included in the SWS.

4.5 Combustion Appliance Zone Testing

Industry discussions around combustion testing are underway, and are expected to result in changes to the BPI-1200 standard. Therefore, comments related to this topic have been labeled as “Further investigation required.”

As the industry reaches consensus and BPI-1200 is updated, these comments will be resolved and the SWS edited to reflect industry standards and codes.

4.6 Crosswalk Between Housing Types

All three housing types of the SWS were included in the online tool when they were developed as separate, stand-alone documents; thus, their differences and inconsistencies are apparent now that the sections are available for review in the online tool.

For example, within a particular topic or subtopic, some details may apply only to multifamily or only to single-family housing. On closer examination, commenters and committee members sometimes noticed that more information is included about one housing type than about another. The details should be edited to reflect the same information across all housing types if they apply. Because the manufactured housing document was written separately from the other two housing types, its content differs substantially from the others.

The executive committee recommended a crosswalk between the three housing types to ensure consistency.

4.6.1 *Installing Insulation*

One example of the inconsistencies was in the documentation that should be provided when installing insulation, as commented on in the insulation topic. This led to a review of the insulation section and ensuring consistency across all details with the language. Please see the Appendix for the full list of changes that were made.

5 Lessons Learned

Lessons learned are based on comments from committee members and NREL staff.

5.1 Meeting Preparation

Extensive meeting preparation ensures the most effective use of in-person time. Communication before the event is key to the committees' ability to complete their tasks, as it allows the committee members to be prepared to work when they arrive at the event. Although webinars were held on the conduct of the meetings, no pre-webinars were held on the content of the comments. Convening the committee before the event to review comments would guide the in-person discussions to specific topics and skip the unnecessary small details that can be handled offline.

5.1.1 *Selecting Subject Matter Experts*

Select engaged SMEs who have an investment in the SWS. Engaged committee members were familiar with the content of the SWS, knew how to navigate the tool and the content, and understood the topics of discussion during the committee meetings. Thus, the members were more confident in their decisions as a committee.

5.1.2 *Working With Committee Chairs*

Committee chairs steer the meetings. Lack of leadership weakens the process and delays the committee. Committee chairs should be engaged and assume ownership from the point of selection, throughout the event, to closeout. Working with chairs before the event to organize comments into themes and gather necessary reference material would help the in-person process advance at the required pace.

5.1.3 *Working With Committee Members*

Work with committee members before the event so they can become acquainted. A working webinar before the in-person meeting gives committee members an opportunity to meet and start discussing their roles, the process, and the comments in their topic. This also helps with acquiring the proper materials needed for the meeting. Most importantly, beginning work early and prompting discussion between members help to engage committee members through discussion. They will thus be more likely to review their assigned comments before the event.

5.1.4 *Working With Event Venue and Conference Organizer*

Working with the event venue for food, room setup, and all other details was successful. The committee members appreciated the meetings being located at the same location as the ACI conference. Additionally, marketing of the event was delivered through ACI.

5.1.5 *Comment Deadline*

The selection of the comment deadline was based on many factors: when the event occurred, the quantity of expected comments, and allowing enough time for the committee members to prepare for the event. Closing the comment period 1 week before the event was not enough time for the committees to thoroughly review the comments before the meeting. Two to three weeks before the event is recommended.

5.2 Committee Meetings

The committee meetings were an effective use of time for the committee members to meet and discuss the comments.

5.2.1 Physical Documents Versus Digital Documents

PDF copies of the SWS sections the committees were reviewing were provided to the scribes in the event that the SWS online tool wasn't working. The copies were used during the meetings, even though it was easiest to access the tool by searching for the detail by number. Some committee members also had paper copies of the comments and the corresponding paper section of the SWS. Other members employed their personal electronic devices to navigate both the comment spreadsheet and the SWS tool. Both worked well, but the physical documents were very handy to have during the meeting.

5.2.2 Access to References

The committee members needed the major code references on hand to look up relevant terms and sections as they revised text. References should be brought by committee members when possible or provided if necessary at the in-person meeting.

5.2.3 Limit the Number of Comments To Review

The committees had varying numbers of comments to address. If organized and reviewed before the in-person meeting, approximately 30 to 50 comments could probably be handled in one day.

5.2.4 In-Person Meetings

Conducting the meetings in person is an invaluable component of the process. Committee members engaged at a higher level, which made it easier to engage through a webinar after the in-person event. The meeting also facilitated many beneficial side conversations.

5.2.5 Executive Committee Meeting

The executive committee meeting was a valuable means of summarizing the major topics of discussion in the subcommittee meetings. It was also extremely valuable to have DOE representatives at the table for their technical and programmatic insights. For example, DOE discussed the requirements of the WAP program requirements for a topic such as insulation versus industry insulation practices for the same topic. It is important that both parties be represented in the committee meeting.

5.2.6 Code Versions and Updating the Standard Work Specifications

When possible, the SWS should reference the current version of code, rather than specifying a specific code year. Every time the code changes, the SWS must be updated. This can be as frequently as every 3 years. Also, each time the SWS is updated, the downstream products, such as certifications and field guides, require updates.

To read more about the role of codes and standards in the SWS, see Section 1: Using the Standard Work Specifications: <https://sws.nrel.gov/learn#codes>.

5.3 Closeout of Committee Meetings

5.3.1 Post-Meeting Work

After the committees reviewed the comments during the event, numerous follow-up items had to be completed. Comments were sent to committee chairs and members for clarification. Codes were pulled to confirm language and new definitions and details were created. A significant time commitment was required to adjudicate the changes, update the SWS tool text, and respond to commenters with the resolutions to their comments.

5.3.2 Outreach About Updates to the Standard Work Specifications

Communication of updates, the timing of the update, and the changes that were made are all important factors that need to be carefully considered. The changes cannot be overcommunicated. This report was made available along with the comment report to ensure that all questions were answered.

Appendix

Meeting Agenda

Monday, April 28, 2014
Cobo Center

8:30-9:00 am	Breakfast	Room 420A
9:00-10:15 am	Welcome Introductions of Committee Members Background Presentation Meeting Procedures, Q&A	Room 420A
10:15- 10:30 am	Break	
10:30 am-12:00 pm	Subcommittee Meetings	Health & Safety: Room 420A Air Sealing & Insulation: Room 420B Heating, Cooling, and Ventilation: Room 430A Baseload: Room 430B
12:00-1:00 pm	Lunch Lunch Keynote: Overview of the Standard Work Specifications Online Tool	Room 420A
1:00-5:00 pm	Subcommittee Meetings	Health & Safety: Room 420A Air Sealing & Insulation: Room 420B Heating, Cooling, and Ventilation: Room 430A Baseload: Room 430B

Friday, May 1st, 2013
Detroit Marriott at the Renaissance Center

8:30-9:00 am	Breakfast	Level 5, Duluth AB
9:00-12:00 pm	Executive Committee Meeting	Level 5, Duluth AB

Meeting Minutes From Subcommittees

Health & Safety Meeting Minutes

1. Call to order by the subcommittee chair or presiding member
 1. Date: April 28, 2014
 2. Time: 10:20 a.m.

3. Location: Room 420A, Cobo Center, Detroit, Michigan
 4. Meeting type: Regular
 5. Name of subcommittee chair or presiding member: Chris Jones
 6. Names of members present: Scott Kashuba, Randy Olsen, Jonathan Coulter, Brad Turner, Paul Francisco, Chris Jones
 7. Names of public present: N/A
 8. Appoint vice chair: Scott Kashuba
 9. Scribe: Chuck Kurnik
 10. Review and approval of agenda: Approved
2. Consideration, correction, and approval of minutes of the previous meeting: N/A
 3. Review of SWS comments: Refer to Comment spreadsheet
 4. Review of crosscutting issues (items that need to go to executive committee): Refer to spreadsheet—flagged in executive committee column
 5. Review of proposed procedure changes
 6. Unfinished business: N/A
 7. New business: N/A
 8. Adjournment time: 5:43 p.m.

General Parking Lot: N/A

Parking Lot for Enhancements for SWS Online Tool: N/A

Air Sealing & Insulation Meeting Minutes

1. Call to order by the subcommittee chair or presiding member
 - a. Date: April 28, 2014
 - b. Time: 10:20 a.m.
 - c. Location: Room 420B, Cobo Center, Detroit, Michigan
 - d. Meeting type: Regular
 - e. Name of subcommittee chair or presiding member: Tony Link
 - f. Names of members present: Kelly Cutchin, John Porterfield, Thom Knoll, Tony Link, Bob Pfeiffer, Sean Bleything
 - g. Names of public present: Devon (last name unknown)
 - h. Appoint vice chair: Sean Bleything
 - i. Scribe: Steve Lommele
2. Review and approval of agenda: Approved

3. Consideration, correction, and approval of minutes of the previous meeting: N/A
4. Review of SWS comments: Refer to Comment spreadsheet
5. Review of crosscutting issues: Refer to spreadsheet—Flagged in executive committee column
6. Review of proposed procedure changes: N/A
7. Unfinished business: Public comment provided by Devon on cathedralized ceilings:
 - a. Devon suggested that cathedralized ceilings are typically nailed, not screwed. So it could be a structural issue and not a performance issue to include too much insulation.
 - b. Reason for taking out insulation probably had to do with condensation under deck
8. New business: N/A
9. Adjournment time: 5:37 p.m.

General Parking Lot:

- 3.1402.5b—Revisit whether or not access is required to all crawlspaces
- This is a technical document, not a policy document, that describes the objectives of the work (when it's called for) but does not dictate that all work is required.
- 3.1001.2e—Proposed definition for *durable* would be 50 years or lifetime of measures.
- More detailed instruction must be provided to commenters about providing justification and reasoning for recommendations.
- 3.1101.X—Do any of these specs apply to single-family homes?

Parking Lot for Enhancements for SWS Online Tool: Is there a way for people to see what specifications have been incorporated into field guides and who has done them?

Heating, Cooling, and Ventilation Meeting Minutes

1. Call to order by the subcommittee chair or presiding member
 - a. Date: April 28, 2014
 - b. Time: 10:30 a.m.
 - c. Location: Room 430C, Cobo Center, Detroit, Michigan
 - d. Meeting type: Regular
 - e. Name of subcommittee chair or presiding member: Paul Raymer
 - f. Names of members present: Anthony Cox, Don Prather, Bruce Manclark, Mark Bergmeirer, Adam Romano, Stephen Christensen
 - g. Names of public present: N/A
 - h. Appoint vice chair: Anthony Cox
 - i. Scribe: Heather Head

2. Review and approval of agenda: Approved
3. Consideration, correction, and approval of minutes of the previous meeting: N/A
4. Review of SWS comments: Refer to Comment spreadsheet
5. Review of cross-cutting issues:
Refer to spreadsheet- Flagged in executive committee column
6. Review of proposed procedure changes:
Come up with way of screening comments for greater clarification? Get more clarification from the commenters.
7. Unfinished business:
Parking Lot in Executive Committee Column in spreadsheet.
8. New business: N/A
9. Adjournment time: 3:36 p.m.

General Parking Lot: N/A

Parking Lot for Enhancements for SWS Online Tool: N/A

Baseload Meeting Minutes

1. Call to order by the subcommittee chair or presiding member
 - a. Date: April 28, 2014
 - b. Time: 10:25 a.m.
 - c. Location: Room 430B, Cobo Center, Detroit, Michigan
 - d. Meeting type: Regular
 - e. Name of subcommittee chair or presiding member: Chris Baker
 - f. Names of members present: Glen Salas, David Mountin, Chris Baker
 - g. Names of public present: N/A
 - h. Appoint vice chair: Glen Salas
 - i. Scribe: Deb Lastowka
2. Review and approval of agenda: Approved
3. Consideration, correction, and approval of minutes of the previous meeting: N/A
4. Review of SWS comments: Refer to Comment spreadsheet
5. Review of crosscutting issues (items that need to go to executive committee): Three issues have been flagged for executive committee: 7.8103.6b, 7.8101.2a, 7.8101.2b
6. Review of proposed procedure changes:

- a. We recommend a joint session after the individual committees conclude to talk about crosscutting issues.
 - b. All committee members should have the option to be an alternate for all committees.
- 7. Unfinished business: No public in attendance.
 - 8. New business: N/A
 - 9. Adjournment time: 2:46 p.m.

General Parking Lot: N/A

Parking Lot for Enhancements for SWS Online Tool: When collecting comments, we need to really let people know, the more information provided the better. The committee did not always understand the comments that were submitted and some of them could have used more context/recommendations.

Meeting Minutes From Executive Committee

- 1. Call to order by the subcommittee chair or presiding member
 - a. Date: May 2, 2014
 - b. Time: 8:35 a.m.
 - c. Location: Room Duluth AB, Marriott Renaissance Detroit, Detroit, Michigan
 - d. Meeting type: Regular executive committee meeting
 - e. Name of subcommittee chair or presiding member: Tony Link
 - f. Names of members present: Tony Link, Chris Jones, Chris Baker, Josh Olsen, Paul Raymer
 - g. Names of public present: Randall Olsen, Anthony Cox
 - h. Appoint vice chair: Josh Olsen
 - i. NREL present: Heather Head, Steve Lommele, Chuck Kurnik, Rachel Romero
 - j. Scribes: Rachel Romero and Chuck Kurnik
- 2. Review and approval of agenda: Approved
- 3. Consideration, correction, and approval of minutes of the previous meeting: N/A
- 4. Review of SWS comments: Refer to Comment spreadsheet
 - i. Health and Safety: Webinar week of May 5 to finish the comments
 - b. Air Sealing & Insulation
 - c. Heating, Cooling, and Ventilation
 - d. Baseload
- 5. Review of crosscutting issues (items that need to go to executive committee)
 - a. General Comments

- i. Definitions
 - ii. Draft Testing- Summary of Health and Safety Committee Resolution
 - iii. General Comments on SWS—Kriger
 - 1. Wills to musts and triggers for requirements in SWS
 - 2. Ventilation versus venting
 - a. Committee agrees
 - b. Venting for combustion appliances, and use ventilation for air movement to control moisture, pollutants, and accumulated heat
 - iv. SWS Crosscutting
 - 1. NREL/DOE to make plan to move forward on this
 - 2. Use the application programming interface-generated spreadsheet
6. Review of proposed procedure changes
- a. Health & Safety: N/A
 - b. Air Sealing & Insulation: N/A
 - c. Heating, Cooling, and Ventilation: N/A
 - d. Baseload
 - i. We recommend a joint session after the individual committees conclude to talk about crosscutting issues.
 - ii. All committee members should have the option to be an alternate for all committees.
 - e. Chairs
 - i. Reorganize how the comments are made
 - 1. Improve what is provide with comments
 - 2. No questions allowed
 - 3. Look at how ASHRAE requires comments.
 - ii. Monday and Tuesday morning, afternoon
 - iii. Ask for direct contractor input
 - f. NREL feedback: Changes from the feedback sheets will be provided along with lessons learned.
7. Unfinished business: Public comments—align all manufactured, single-family, and multifamily housing in general.
8. New business: N/A
9. Adjournment time: 11:51 a.m.

General Parking Lot: N/A

Parking Lot for Enhancements for SWS Online Tool: N/A

Outreach for Committee Member Recruitment

NREL developed recruitment materials, including robust Web content for use on the [SWS Tool](#) site; general email outreach content for use by NREL, DOE, and relevant partners; and generic Web outreach content for use in blogs, newsletters, and events calendars.

Specifically, NREL used the following outreach channels in its efforts to recruit SMEs:

NREL/DOE Resources

- Post as an SWS Tool news item.
- Distribute an email to SWS Tool registered users.
- Distribute an email to the Guidelines mailing list of 2,433 individuals.
- Contact original single-family, manufactured housing, and multifamily SMEs
- Post as Weatherization Improvement Program website news item to be distribute via the NREL Twitter account.
- Post as Buildings news item.
- Distribute to lists of applicants and participants in the single-family and multifamily Job Task Analyses SMEs.
- Distribute to the Building America listserv.

Partner Outreach

- Request promotion by BPI: Newsletter with list of 23,109 individuals.
- Request promotion by Economic Opportunity Studies: Facebook, newsletter, etc.
- Request promotion by the Interstate Renewable Energy Council: Website, newsletter, etc.
- Request promotion by Advanced Energy.
- Request promotion by the Association for Energy Affordability: List of multifamily experts.
- Request promotion by partner utilities, including Xcel and Austin Energy.
- Request promotion by the New York State Energy Research & Development Authority.

Other Outreach Channels

- Post updates and outreach content to the Home Energy Pros Blog.
- Request promotion by the following organizations:

- America Council for an Energy-Efficient Economy
- Energy Efficiency Business Coalition
- Weatherization Assistance Program Technical Assistance Center
- The National Association for State Community Services Programs
- California Center for Sustainable Energy.

Monday Pre-Con: NREL SWS Meetings ACI Website Page

Monday Pre-Con: NREL SWS Meetings



The Guidelines for Home Energy Professionals project defines high-quality energy efficiency retrofit work through Standard Work Specifications (SWS) for single-family, manufactured, and multifamily home energy upgrades. The SWS were developed in collaboration with industry and public sector subject matter experts.

To ensure the SWS continues to be a consensus-based, centralized resource for promoting best practices and maintaining consistency throughout the home performance industry, an SWS maintenance committee will inform regular revisions of the SWS in accordance with current home performance industry best practices. The first committee meetings will be held on April 28, 2014 from 9:00 a.m. to 5:00 p.m. EDT. All stakeholders are invited to observe the proceedings at the Cobo Center. Please see the details below for the committee and the associated room. Plenary will take place at 9:00 a.m., with individual committee meetings commencing at approximately 10:30 a.m.

- SWS Maintenance Event Plenary and Health & Safety Committee: Room 420 A
- Air Sealing & Insulation Committee: Room 420 B
- HVAC Committee: Room 430 A
- Baseload Committee: 430 B

The subcommittees will be addressing technical comments that have been submitted on the SWS as well as providing feedback on the usability of the [SWS online resource](#). New comments will not be addressed at the SWS Maintenance event; all comments on the SWS need to be submitted by April 21, 2014 to the SWS.

General Comments

General Comment #1

I've found the SWS commenting easy to use and I've submitted quite a few comments. I like the fact that I can review my previous comments to avoid submitting the same comment twice. I realize that today is the last day for comments in the current round. I have a few general comments and suggestions that don't really fit within the commenting tool.

- Detail names and subtopics should be more descriptive and specific. I have difficulty knowing what's inside the detail and subtopic by their current names.
- I suggest using the find-and-replace function to change all *wills* to *musts*.
- What specifically triggers a requirement to comply with a detail? Is there a way to make this clearer?

There may be a number of potential triggers that would require compliance with a detail.

1. An agency chooses a cost-effective measure, covered by the SWS, and plans to install it.
2. A cost-effective measure needs an associated repair measure for durability.
3. A condition at the home requires a mitigation procedure to accompany weatherization for health, safety, and/or durability.
4. A measure may be required if not currently present in a home.

If these triggers or others are relevant, could you state them at the detail level for the sake of clarity?

There are two terms that could cause confusion: *ventilation* and *venting*. Could we use venting for combustion appliances, and use ventilation for air movement to control moisture, pollutants, and accumulated heat?

Thanks for the opportunity to comment.

Response from Executive Committee:

At this time, the *wills* will not be changed to *musts*.

The committee agrees about the confusion with ventilation versus venting. *Venting* should be used for combustion appliances, and *ventilation* should be used for air movement to control moisture, pollutants, and accumulated heat. Further investigation is required to understand the extent of the changes to the SWS.

General Comment #2

I wish to comment on the issue of draft testing (or lack thereof) in the SWS. Since there is no specification regarding performing draft testing within the SWS, I am unable to comment using the comment tool, so I am addressing the comment to the general mailbox.

I wish to point out that the SWS does not include any specification on performing a draft test on combustion appliances. However, on the BPI HEP Certification Field Exams (Quality Control

Inspector, Energy Auditor, Crew Leader) candidates are required calculate minimum draft pressure based on existing weather conditions, perform worst case draft testing on DHW, and make appropriate recommendations BASED ON BPI STANDARDS. Because these BPI HEP exams are supposed to be based on the SWS, this is confusing for trainers/candidates. To further confuse matters, BPI 1200, also does not include any information regarding calculating minimum draft pressures and/or performing draft testing; the BPI Standard containing this information is in the BPI Building Analyst Professional Standard.

I realize the BPI Standards and exams are not under the control of the SWS Committees, but this area of conflict and confusion should be noted and somehow addressed among the organizations' working groups/committees.

Response from Executive Committee:

Currently there are discussions in the industry around combustion appliance zone testing. BPI 1200 is currently undergoing revision, and the issues addressed in this comment should be worked out when revision is complete. When the issue is resolved, the SWS will be updated.

General Comment #3

I have had difficulty understanding how particular work scopes related to each housing type were selected. As a cross-cutting exercise it would seem appropriate to review the three types side by side and, where possible, to standardize wherever possible. For example, at 3.11 Walls, within Air Sealing, provides specific instructions for only MH (3.1101.1) and MF (3.1101.2), but nothing for single family, though the instructions for MH seem sage advice.

Another cross-cut that seems to have failed is between the various sections, including air sealing, insulation, and heating and cooling, reiterating the requirement to check CAZ safety offered at 2.0201.1i. (Also note no subsection h.) There is a requirement at job completion to test out CAZ safety, but nothing regarding potential changes during multi-day, or multi-contractor, projects which could impact CAZ safety.

Response from Executive Committee:

It was agreed that a crosscutting review is important. DOE and NREL will plan to complete this if possible. New search functionality and the application programming interface-generated spreadsheet would be helpful in assisting with this review.

General Comment #4

The following comments were submitted via PDF to the workforce guidelines email address and are summarized here:

Term	Definition	Comment	Resolution	Rationale for Decision
Cathedral ceiling	A condition in which the ceiling has the same slope as the roof	See Vaulted Ceiling	Rejected	Two different definitions.
Closed crawl space	A foundation without wall vents that uses air-sealed walls, ground and foundation moisture control, and mechanical drying methods to control crawl space moisture Insulation may be located at the conditioned floor level or on the exterior walls Return pathways are not allowed from the crawl space to the living space	Ducted returns, or air barrier exists between crawl space and conditioned space?	Rejected	No suggested change.
Ignition barrier	Any layer of material that protects another from catching fire due to heat or spark	Specifically provide that intumescent paint can be an option for ignition barrier, e.g., paint B vent as an alternative to building sheet metal dam.	Rejected	Comment covers detail, where the definition is intended to be broad.
Interior storm window	An additional window assembly installed on the interior of the main window	It would be nice to avoid "storm" for this product. An interior window thermal product could be operable like a storm, an insulating product such as insulating shade, or multi-glazing such as glazing attached to or replacing existing sash. A real terminology conundrum!	Rejected	using generally accepted nomenclature for the definitions. Comment. No question.
JTA	Job Task Analysis	As applied, JTA is more often "learning objectives" of instruction, and in reality does not involve analysis.	Rejected	Insufficient information provided by commenter. No actionable comments to respond to in the comment text.
Knee wall	Any wall between the conditioned space and the attic	This definition could lead to confusion if applied to the wall common between finished attic and a contiguous UNFINISHED attic space (e.g., partially finished attic).	Rejected	Using a common industry-accepted term here.

Term	Definition	Comment	Resolution	Rationale for Decision
RPA	Radiant Professional Alliance	Changed name from Radiant Panel Association	Accepted with modification	This is the current name. We will add website.
Standby loss	Heat loss through the outer part of a water heater Energy that is used even when a device is turned off	Standby loss may have more general meaning, and include loss to the vent (an inner part of tank heaters!) when burner is off. Would the term include "off cycle" loss from hydronic equipment?	Rejected	Accurate in context.
Vapor barrier	A material that retards the passage of water vapor and contains a perm rating of less than 1	A material that slows the passage of water vapor and contains a perm rating according to the current version of ASTM standard on vapor retarder	Accepted with Modification	The definition of vapor barrier will be removed.
Vapor retarder	A material that slows the passage of water vapor and contains a perm rating above 1	A material that slows the passage of water vapor and contains a perm rating according to the current version of ASTM standard on vapor retarder	Accepted with Modification	Vapor retarder will be defined as a material or construction that impedes the transmission of water vapor under specified conditions.
Wind intrusion	A condition where air from outside of a structure can pass through insulation and reduce its performance	Perhaps air intrusion would be better, since pressure driving air through insulation could also result from stack or induced forces.	Accepted	

Insulation Installation Documentation

For these SWS: (loose-fill)

4.1003.1d

4.1003.3c

4.1003.4d

4.1003.8 - need to add “g” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation"

4.1003.9 - need to add “g” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation"

4.1003.10 - need to add “h” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation"

4.1003.11 - need to add “b” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation"

4.1003.14g

4.1005.2d

4.1005.4d

4.1005.8d

4.1301.2d

4.1301.3d

4.1301.7d

4.1301.13d

4.1303.1e

Update specification column to read:

A dated receipt signed by the installer will be provided that includes:

- Insulation type
- Coverage area
- R-value
- Installed thickness and minimum settled thickness
- Number of bags installed in accordance with manufacturer specifications

Update Objective(s) column to read:

Document job completion to contract specifications

Confirm amount of insulation installed

Ensure ability to match bags required for total area completed

Comply with 16 CFR 460.17

For these SWS: (not loose-fill, not aluminum)

4.1003.2 - need to add a “b” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation"

4.1003.5b

4.1003.6b

4.1003.12 - need to add “g” row to meet the CFR requirement, language below works. Title can be "Onsite Documentation”

4.1003.13b

4.1004.4d

4.1004.5 - need to add row

4.1005.1c

4.1005.3c

4.1005.5d

4.1005.6c

4.1005.7d

4.1006.1d

4.1006.2e

4.1088.4 - need to add row

4.1088.5 - need to add row

4.1102.2 – need to add row

4.1103.1 – need to add row

4.1103.2 – need to add row

4.1103.3d

4.1103.4 – need to add row

4.1104.1 – need to add row

4.1104.2 – need to add row

4.1104.3 – need to add row

4.1104.4 – need to add row

4.1301.1d

4.1301.4d

4.1301.5e

4.1301.6e

4.1301.8d

4.1301.9 – need to add row

4.1301.11e

4.1301.12 – need to add row

4.1301.14j

4.1301.15h

4.1303.2e

4.1303.3g

4.1401.1 – need to add row

4.1402.1 – need to add row

4.1402 – need to add row

4.1402.3 – need to add row

4.1403.1j

Update the specification column to read:

A dated receipt signed by the installer will be provided that includes:

- Coverage area

- Thickness
- R-value

Update the objective(s) column to read:

Document job completion to contract specifications
 Confirm amount of insulation installed
 Comply with 16 CFR 460.17

For these SWS (type of insulation is not specified):

4.1002.2c
 4.1088.3c
 4.1088.6 - need to add row
 4.1102.1d
 4.1103.5 – need to add row
 4.1301.10k

Use this language in spec:

A dated receipt signed by the installer will be provided that includes:

- Insulation type
- Coverage area
- R-value
- Installed thickness and settled thickness (settled thickness required for loose-fill only)
- Number of bags installed in accordance with manufacturer specifications (for loose-fill only)

Update the objective(s) column to read:

Document job completion to contract specifications
 Confirm amount of insulation installed
 Comply with 16 CFR 460.17

And for this SWS (aluminum):

4.1088.2 - need to add row - Onsite Documentation

Use this language in spec:

A dated receipt signed by the installer will be provided that includes:

- Number and thickness of air spaces
- R-value
- Direction of heat flow

Update the objective(s) column to read:

Document job completion to contract specifications
 Comply with 16 CFR 460.17