



Energy Audit Approval Procedures What Does WPN 13-5 Mean?

Thursday, Feb. 26, from 3:00 – 4:15

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The BIG Picture

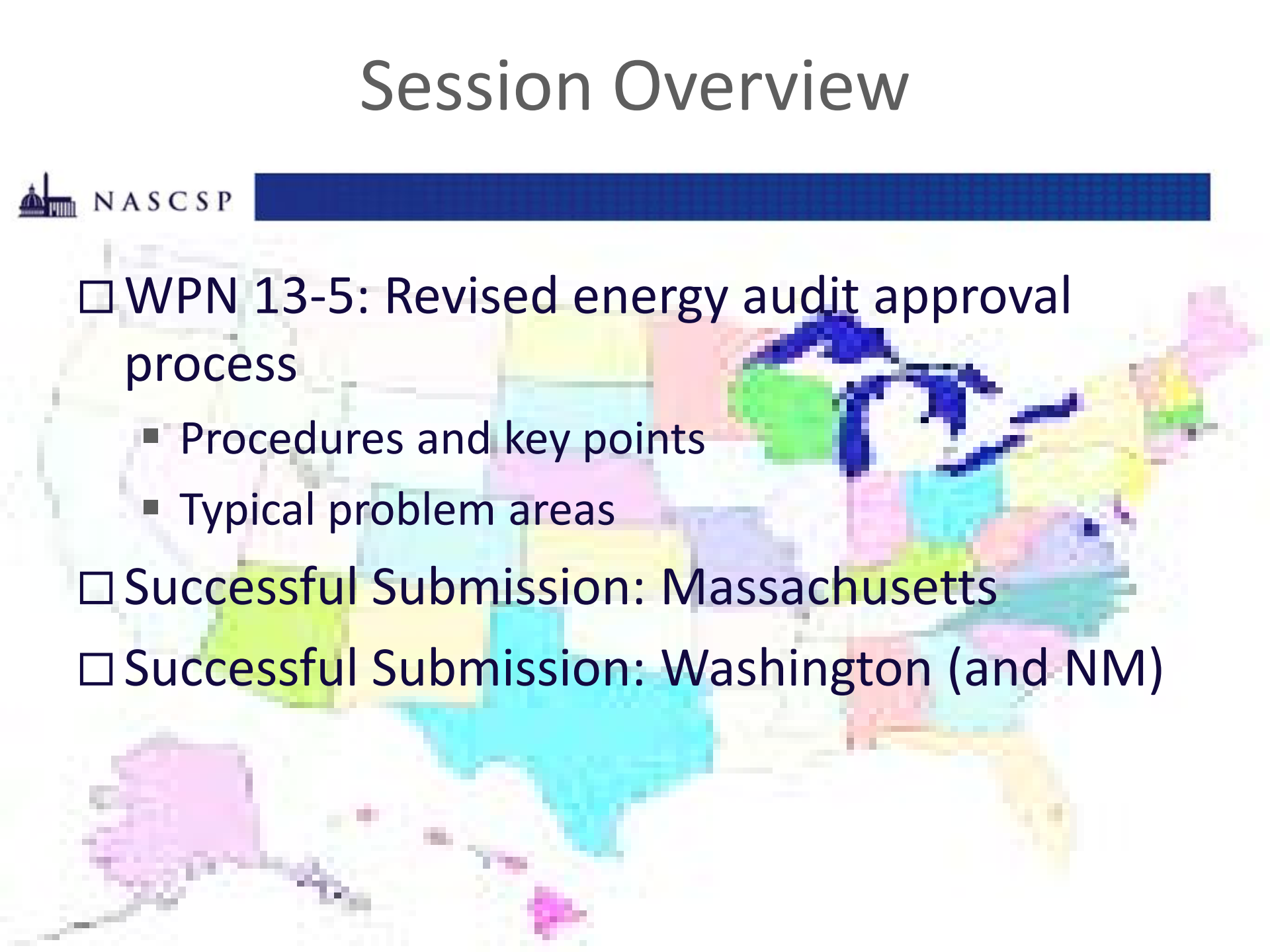
1. $SIR \geq 1.0$

2. H&S

Where SIR = Savings to Investment Ratio of each Energy Conservation Measure (ECM) and total project ECMs

H&S = The Health and Safety of clients and WAP workers

Session Overview

- WPN 13-5: Revised energy audit approval process
 - Procedures and key points
 - Typical problem areas
 - Successful Submission: Massachusetts
 - Successful Submission: Washington (and NM)
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WPN 13-5: Step by Step #1



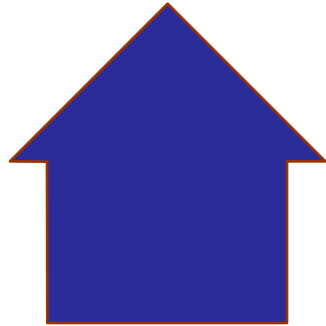
DOE-approved_Audit?
(You're done)

New, non-DOE-approved audit?

$SIR \geq 1.0$

- Energy estimating methodology
- Measure interaction
- Cost-effectiveness requirements
 - How is air sealing handled?
 - How are incidental repairs handled?

Measure Priority and Interaction



Pre-Weatherization

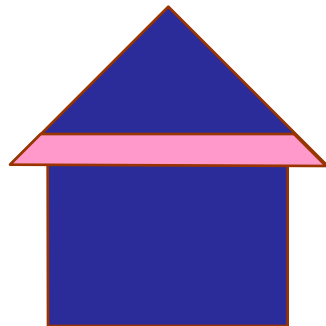
Design heating load = 50 kBtu/hr

Annual heating load = 100 MMBtu/hr

Annual heating energy use = 167 MMBtu/hr

Attic insulation: SIR=8

High-efficiency furnace: SIR=5



After Attic Insulation

Design heating load = 40 kBtu/hr

Annual heating load = 80 MMBtu/hr

Annual heating energy use = 133 MMBtu/hr

Interacted SIR of furnace replacement=4

WPN 13-5: Step by Step #2

Weatherization Measures Considered

- List of ECMs + H&S Measures “enabled” in audit
- Material and Labor Costs for each measure
 - For typical subgrantee that is representative of state/territory
 - Averaged for state is acceptable
- Lifetime of each measure
 - NEAT/MHEA defaults – good place to start
 - Longer lifetimes are good if justified



Weatherization Measures Cont'd



...and what's wrong with solar heated DHW in the right situations?



Might be the highest energy saving measure in mild climates

WPN 13-5: Step by Step #3

Sample Audits

10 audits of each type of building

- 10 single family + 10 manufactured homes (+ 10 multifamily)
- Substitute a couple of 1-4 unit buildings for SF if applicable

Input data & Assumptions

- Field assessments including notes and diagnostic test results
- Audit Input Report or equivalent

Recommended Measures

- w/SIRs, listed in order of decreasing SIR + total job SIR
- Incidental repair costs

Sample Audit Non-Starters

$$SIR \geq 1.0.$$

If anything violates that...



**You got some
'splainin' to do!**

Sample Audit Non-Starters - 1

- ❑ SIR above 10 for anything besides General Heat Waste (GHW) measures...
- ❑ SIR = 0.999 or lower. No, SIR = 1 is generous
- ❑ HVAC replacement SIR > 4+
- ❑ Window replacement SIR > 2.5 in SF or MH
 - Replacement of double-glazed window
 - Any window replacement as H&S
- ❑ No – or incomplete – blower door testing
- ❑ 2-part audits, e.g. separate audit just for HVAC
- ❑ No HVAC diagnostics

**You got
some
'splainin'
to do!**



Sample Audit Non-Starters - 2

- No or incomplete combustion safety testing
- Audit model does not include windows or other significant building feature
- Not specifying wall type
- Not checking 'Evaluate All' almost always!
- Inadequate air sealing

Rules of thumb:

- Generally good post-blowerdoor reading = [conditioned area + 400] cfm50
- Bad post-blowerdoor reading = [2x conditioned area] cfm50 or more

**You got
some
'splainin'
to do!**



Sample Audit Non-Starters - 3

Won't pass a reality check, i.e., only work in alternate universe...

**You got
some
'splainin'
to do!**

- Recommended measures will save more energy than the house used the previous year. True example: predicted savings of \$13,800 per year on a 985sf house where previous energy bills were \$1,050 per year
- True example: Insulate 1 door, save \$11,335 per year!
- Energy savings of 40% without replacing HVAC and without significant air sealing.
- Need (per ASHRAE 62.2?) to add 2 bath fans to a 1,000sf house that already has a range hood



Sample Audit Non-Starters - Insulation



- No – or minimal – existing insulation in ceiling but not evaluating added insulation
- No – or minimal – existing insulation in walls but not evaluating added insulation
- Inputting existing 4” insulation in 2x4 walls...or worse
- Input existing R-10 when you mean 10” (R-35) of existing insulation
- Specified level of insulation in an open attic. Why not let the audit optimize the R-value?
- Not evaluating floor insulation, esp. in MHs

You got some 'splainin' to do!



WPN 13-5: Step by Step #4



Field Procedures

- Audit procedures and field protocols
 - Copy of Field Guide and Installation Stds. (or Tech. Stds., or auditor's or field operations manual...varies by sGrantee)

- Weatherization Measures installed
 - Statement that only materials that meet or exceed the standards in Appendix A will be installed



WPN 13-5: Step by Step #5



10 CFR 440.21(g) – General Heat Waste (GHW) reduction

- WAP Guidance lists materials that DOE has determined to be generally cost-effective
 - Water heater wrap
 - DHW pipe insulation
 - Low-flow shower heads
 - Faucet aerators
 - Limited caulk and weather-stripping
 - Furnace/AC filters

WPN 13-5: Step by Step #6



Priority Lists are allowed Per 10 CFR 440.21(f)

- For similar dwelling units without unusual energy-consumption characteristics
- Developed by conducting site-specific energy audits of a representative subset

More on Priority Lists



- How was priority list developed?
 - Specifically, what buildings do the priority lists apply to
 - What circumstances will require site-specific audits rather than the priority list?
 - Don't forget to include allowable Incidental Repair \$limits
- ECMs and ECM ranking on a PL are determined by the cost of energy and cost to provide and install the ECMs. Those costs change.

WPN 13-5 advises Grantees to “...annually, at a minimum, evaluate energy costs, measure implementation costs...in order to ensure the approved priority lists remain cost effective and appropriate....”

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Questions?

Visit www.nascsp.org for
more resources and information.



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