



*PY15 Technical Policy Update*

July 14, 2015

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Minnesota Department of Commerce

Division of Energy Resources

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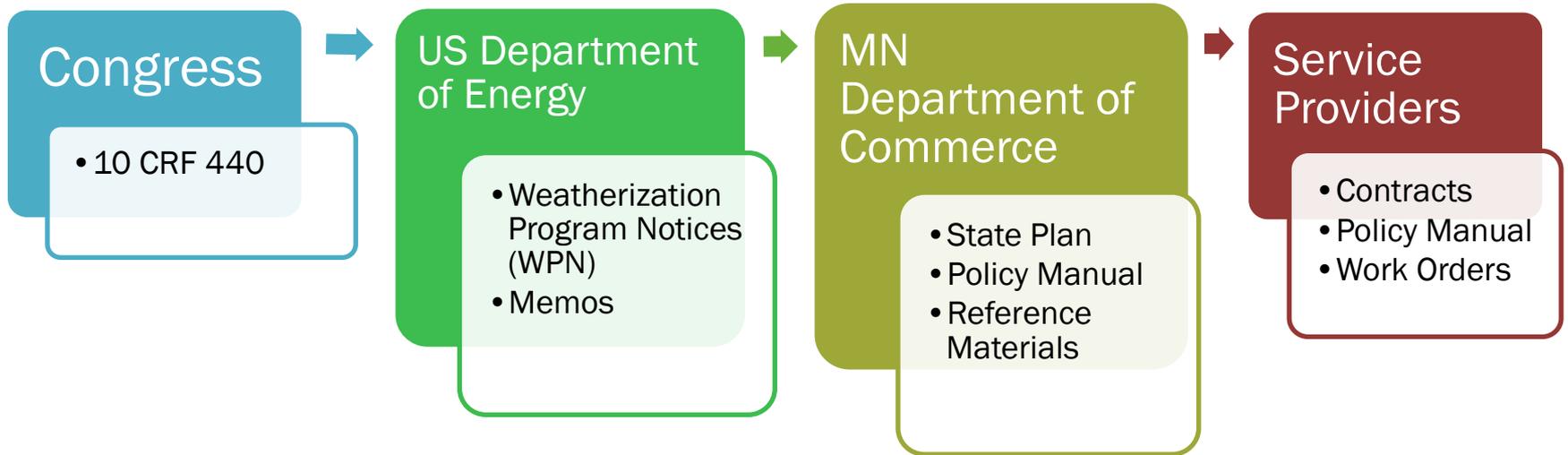
# Session Goal

- Review “Technical” sections of the new Policy Manual

# Our Approach to Change

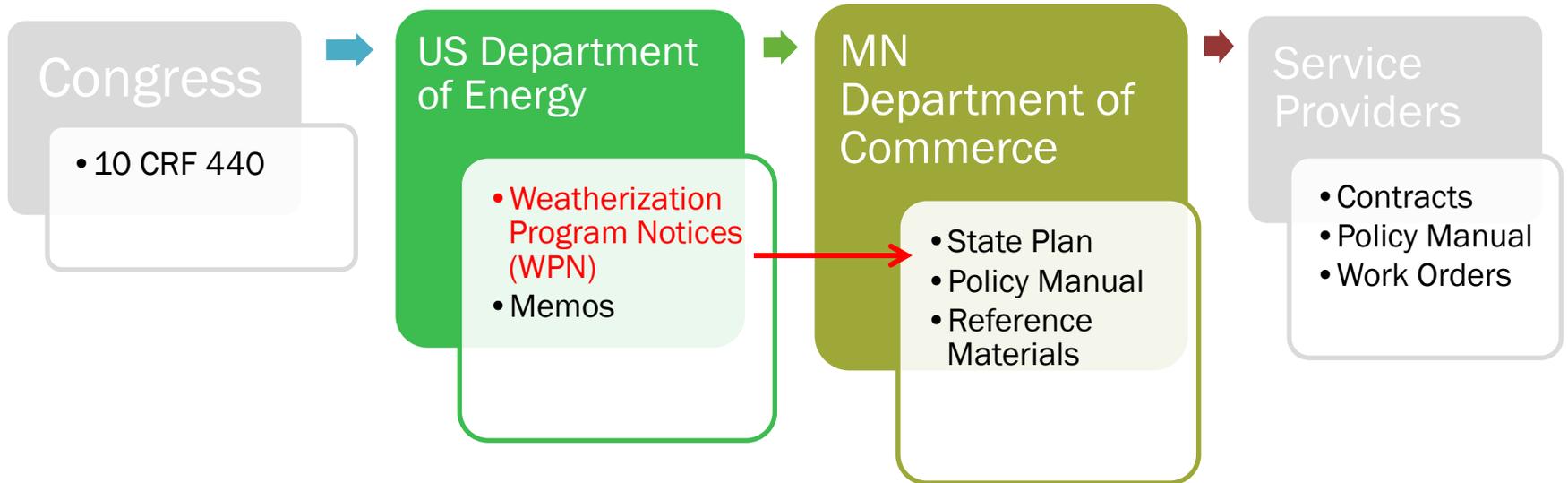
- We use a process based approach with the idea of steady continual improvement.
- Growth mindset vs. Fixed mindset

# Big Picture



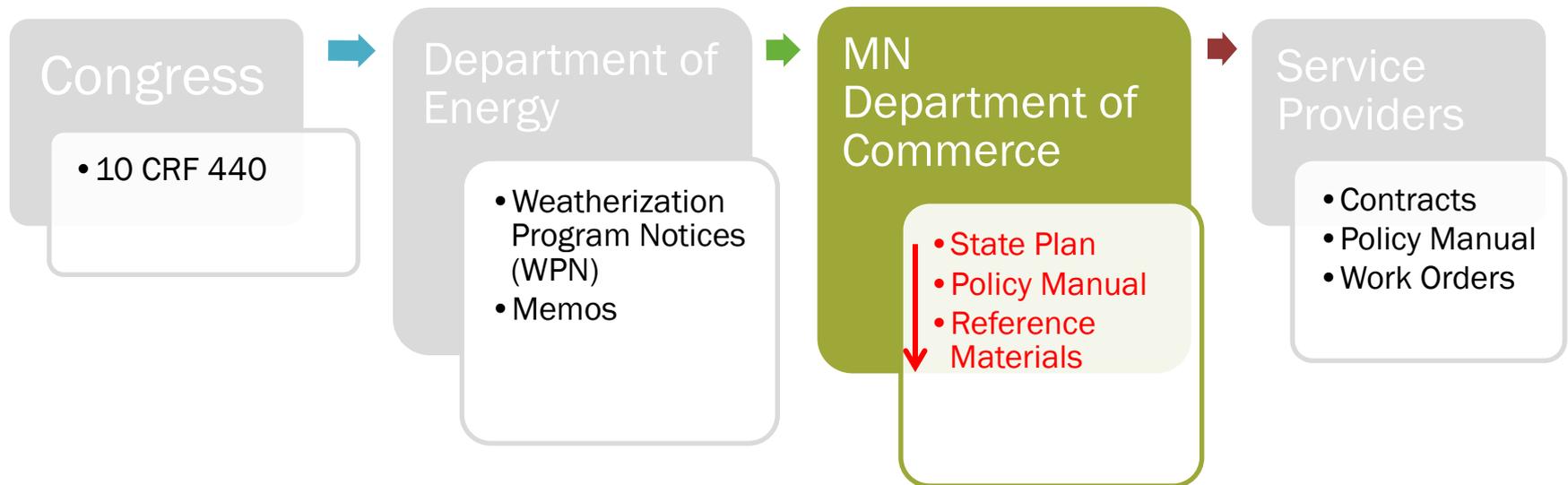
# Big Picture

... Energy Conference focus



# Big Picture

## ... PY15 Training focus



# Policy Manual

- Section 1. Program Management
- Section 2. Household Eligibility
- Section 3. Dwelling Eligibility
- Section 4. Audit Event
- Section 5. Standalone Event
- Section 6. Fiscal
- Section 7. Procurement
- Section 8. Service Provider Monitoring
- Appendices

# Policy Manual

- Section 1. Program Management
- Section 2. Household Eligibility
- Section 3. Dwelling Eligibility
- **Section 4. Audit Event**
- **Section 5. Standalone Event**
- Section 6. Fiscal
- Section 7. Procurement
- Section 8. Service Provider Monitoring
- **Appendices**

# Section 4. Audit Event

**4.1 Definition**

**4.2 Types of Measures**

**4.3 Household File Contents**

**4.4 Energy Audit**

**4.5 Work Orders Issued to Contractors/Crews**

**4.6 Quality Control Inspection**

**4.7 Callback Event**

# Section 4. Audit Event

## 4.1 Definition

- Audit Events will be prioritized over Standalone Events when dwellings are eligible for both event types.
- Conduct work in accordance with the Standard Work Specification.

# Section 4. Audit Event

## 4.2 Types of Measures

- 4.2.1 Energy Conservation Measure
- 4.2.2 Incidental Repair Measure
- 4.2.3 Health & Safety Measure

# Section 4. Audit Event

## 4.2 Types of Measures

- 4.2.1 Energy Conservation Measure

- ECM's must be installed in the order of descending SIR with the following exceptions:

- Mechanical work must be done before building shell measures
    - Air sealing measures must be done before insulation
    - Programmable thermostats will be modeled on guidance found in the *Weatherization Assistant User's Manual* pg. 9-42 (Appendix C)

# Section 4. Audit Event

## 4.2 Types of Measures

- 4.2.2 Incidental Repair Measure

- IRMs must be justified in the WA Software with an explanation of their need and relationship to a specific conservation measure or a group of conservation measures.
- Incidental Repairs are limited to \$2,000 for each Weatherization job with no more than \$1,000 per fund source.

# Section 4. Audit Event

## 4.2 Types of Measures

- 4.2.2 Incidental Repair Measure

**PROCEDURE:**

- If the cumulative job SIR is less than 1.0, use the current State Plans (*Appendix A*) and the *Allowable Measures Chart* (*Appendix C*) to determine if the IRM can be installed as a Health and Safety Measure as identified in Section 4.1.3 of this document.
- In cases where the cumulative SIR remains less than 1.0 as a result of IRM costs, remove the IRM and the associated ECM(s) with the lowest SIR until the cumulative SIR is 1.0 or greater.

# Section 4.1 Audit Event

## 4.2 Types of Measures

- **4.2.3 Health & Safety Measure**

- All Audit and Standalone Events must include an assessment of the Health and Safety issues of the home. Clients must be provided with a written notice of identified health and safety risks, including those that go beyond the scope of WAP.

# Section 4. Audit Event

## 4.3 Household File Contents

- 4.3.1 Eligibility Forms
- 4.3.2 Forms
  - NEW: forms - presentation tomorrow
- 4.3.3 Energy Audit Information
  - site map

# Section 4. Audit Event

## 4.3 Household File Contents

- **4.3.4 WA Data**
  - All relevant data inputs needed to accurately model the house as described in the Weatherization Assistant User's Manual (Appendix C) and the Weatherization Assistant User's Manual-Addendum (Appendix C)
    - » Building Shell calculations
- **4.3.5 Quality Control Inspection**
  - QCI form

# Section 4. Audit Event

## 4.4 Energy Audit

- **POLICY:** Each eligible dwelling unit scheduled for weatherization must have an energy audit. The audit must take place after household eligibility is established and prior to the start of any weatherization work. An energy audit includes a **site visit** where data is collected, a **diagnostic test process**, a client education process, and site-specific **energy modeling** with the WA software.

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- Data Collection
- Diagnostic Tests
- Client Education
- Weatherization Assistant (WA) data entry

### 4.4.2 Measure Consideration

- Clean and Tune
- Heating Plant Replacement
- Electrically Commutated (EC) Motor
- ASHRAE 62.2-2013

### 4.4.3 Work Orders

- Change Orders

### 4.4.4 Manufactured Housing Requirements

- Codes
- Alterations

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

#### – 4.4.1.1 Data Collection

##### » Photo list

- All sides of the exterior
- Insulation type and levels
- Heating plant and water heater, venting, labels, and appliance
- Items within the scope of work
- Information that will affect the scope of work
- Health and safety concerns
- Information needed to understand the existing conditions and the scope of work
- Information needed by crews or contractors to perform their work properly
- Justification for deferral/walk away

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- 4.4.1.1 Data Collection
- 4.4.1.2 Diagnostic Tests (full list - Appendix D)
  - » Gas Range Test for Fuel Leaks (accessible lines)
  - » CAZ Depressurization Test
  - » Heat Exchanger Integrity - Visual Inspection
  - » Heat Exchanger Integrity - Oxygen Concentration Test
- Client Education
- Weatherization Assistant (WA) data entry

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- 4.4.1.1 Data Collection
- 4.4.1.2 Diagnostic Tests
- **4.4.1.3 Client Education** – details in Client Participation form
  - » Client will be informed about the following areas:
    - Building and mechanical systems operation
    - Weatherization process
    - Appeals process
- **4.4.1.4 Weatherization Assistant (WA) data entry**
  - » Enter all relevant data (Appendix C - Weatherization Assistant User's Manual and Weatherization Assistant User's Manual – Addendum)
  - » Generate Recommended Measures in WA

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- Data Collection
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- Client Education
- Weatherization Assistant (WA) data entry

### 4.4.2 Measure Consideration

- Clean and Tune
- Heating Plant Replacement
- Electrically Commutated (EC) Motor
- ASHRAE 62.2-2013

### 4.4.3 Work Orders

- Change Orders

### 4.4.4 Manufactured Housing Requirements

- Codes
- Alterations

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- **POLICY:** All measures (ECM, IRM, & HSM) that can be done within the program guidelines shall be done. A complete list of measures can be found in the Allowable Measures Chart (AMC) - (Appendix C).

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- 4.4.2.2 Heating Plant Replacement
- 4.4.2.3 Electrically Commutated (EC) Motor
- 4.4.2.4 ASHRAE 62.2-2013

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- **POLICY:** A clean and tune is required when one or more of the following conditions are present:
- **Heating Plant:**
  - » Carbon monoxide levels in the flue exceed the standards indicated in the MN Weatherization Field Guide - SWS Aligned Edition pg. 446 (Appendix B)
  - » Visual indicators of soot and/or flame rollout
  - » Burners and/or distribution fan are visibly dirty
  - » Heating plant has not been serviced for two or more years

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- **POLICY:** A clean and tune is required when one or more of the following conditions are present:
- **Water Heater**
  - » Carbon monoxide levels in the flue exceed the standards indicated in the MN Weatherization Field Guide - SWS Aligned Edition pg. 446

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- **POLICY:** A clean and tune is required when one or more of the following conditions are present:
- **Oven/Stove Top**
  - » Carbon monoxide levels in the oven or above the burners exceed the standard indicated in the MN Weatherization Field Guide - SWS Aligned Edition pg. 28

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- 4.4.2.2 Heating Plant Replacement
- 4.4.2.3 Electrically Commutated (EC) Motor
- 4.4.2.4 ASHRAE 62.2-2013

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

#### – 4.4.2.2 Heating Plant Replacement

- **POLICY:** All heating plants will be evaluated for replacement. The replacement heating plant must meet or exceed the following criteria:

- » Annual Flue Utilization Efficiency (AFUE) of at least 93%
- » For fuel oil units the AFUE must be at least 80%
- » Sealed combustion two-pipe system except when physical conditions in the dwelling prevent it. Conditions that prevent a two-pipe system must be clearly documented in the household file.
- » Burner with a minimum of two (2) stages
- » Electronically commutated (EC) motor

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

#### – 4.4.2.2 Heating Plant Replacement

- » per SWS 5.3001.1, all heating plant replacements require an ACCA-approved Manual J and Manual S calculations.
- » The calculations can be completed by **either** the Service Provider **or** a licensed/bonded mechanical contractor before the installation of the heating plant.
- » A copy of the Manual J and S calculations are required in the household file.

# Section 4. Audit Event

## 4.4 Energy Audit

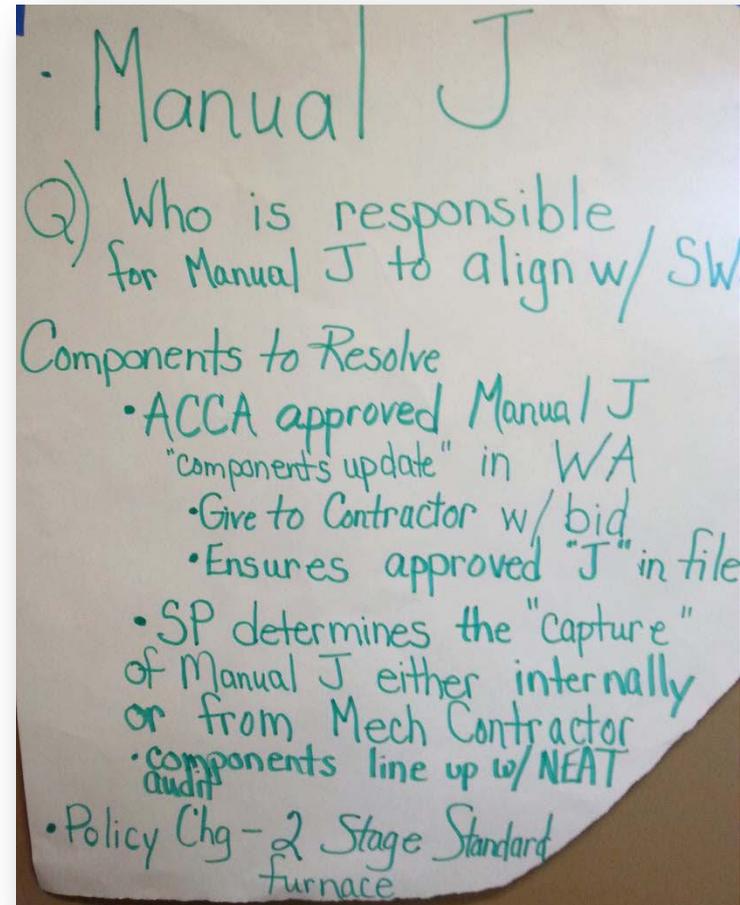
### 4.4.2 Measure Consideration

#### – 4.4.2.2 Heating Plant Replacement

- » When the calculations are done by a mechanical contractor the Service Provider will provide the contractor with the proposed changes to **all building insulation levels** and the **estimated post blower door** number for use in the calculations.

# Section 4. Audit Event

Thanks for all the helpful feedback at the Energy Conference!



# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.2 Heating Plant Replacement

- De-rating: 2 scenarios

- » If the heating plant is less than seven (7) years old or has an AFUE of 93% or greater, the AFUE listed on the data plate will be used to evaluate replacement within the WA software.
- » If the heating plant is 7 years old or older, or has a cracked heat exchanger, or is non-operational at the time of the audit, de-rate the AFUE according to the chart below:

# Section 4. Audit Event

## 4.4.2.2 Heating Plant Replacement

Listed AFUE	De-rated efficiency
55%	49%
60%	54%
65%	59%
70%	63%
75%	67%
80%	72%
85%	76%
90%	81%
92%	83%

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

#### – 4.4.2.2 Heating Plant Replacement

- » If there is no data plate present the steady state efficiency will be used in place of the AFUE.
  
- » If the SIR is less than 1.0 and the heating plant poses a health and safety risk, replacement should be done as a HSM.

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- 4.4.2.2 Heating Plant Replacement
- **4.4.2.3 Electrically Commutated (EC) Motor**
- 4.4.2.4 ASHRAE 62.2-2013

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

#### – 4.4.2.3 Electrically Commutated (EC) Motor

- » **POLICY:** All households with forced air systems that are not being replaced will be evaluated for an Electrically Commutated (EC) motor upgrade.
- » **PROCEDURE:** Create a user defined measure for the EC motor-retro fit and **adjust** the “lifeyr” field to reflect the age of the existing heating plant (**Appendix C – EC Motor**)

Evaluate for replacement by running the audit

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.1 Clean and Tune
- 4.4.2.2 Heating Plant Replacement
- 4.4.2.3 Electrically Commutated (EC) Motor
- **4.4.2.4 ASHRAE 62.2-2013**

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.2 Measure Consideration

- 4.4.2.4 ASHRAE 62.2-2013

- » Not much changed, except...

# BOOM!

**NEAT Audit**

Audit Name  Client ID  Client Name  Alt. Client

Audit Information | Status | Shell | Heating (1) | Cooling (0) | Ducts/Infiltration | Baseloads | **Health & Safety** | Itemized Costs (2) | Utility Bills (1) | Mea

Whole House | Equipment | Building She | **ASHRAE Ventilation**

### Ventilation

		Fans	Room Exists	Operable Window	Pre Wx		Target		Actual Post Wx		Actual Post Wx Occupants	
					CFM	Deficit	CFM	Deficit	CFM	Deficit	CFM	
# of Bedrooms	<input type="text" value="2"/>					80		80		80		82
# of Occupants	<input type="text" value="3"/>	Kitchen 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								89
Sqft of House	<input type="text" value="1290"/>	Kitchen 2	<input type="checkbox"/>									97
State	<input type="text" value="MN"/>	Bath 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		30		30		30		104
City	<input type="text" value="Minneapolis St Paul"/>	Bath 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>		50		50		50		112
Building Height (ft)	<input type="text" value="12.75"/>	Bath 3	<input type="checkbox"/>									119
Pre Wx BD	<input type="text" value="2000"/>	Bath 4	<input type="checkbox"/>									127
Target BD	<input type="text" value="1500"/>	Continuous Ventilation Needed (CFM)				23		42		89		134
Actual Post Wx BD	<input type="text" value="300"/>											142

### Depressurization

		Combustion System Type	Pre Wx	Target	Actual
Pre Wx	<input type="text" value="Natural draft furnace/boiler vented with DWH"/>		200	100	120
Target	<input type="text" value="Induced draft furnace/boiler vented with DWH"/>	All Other Exhaust Vent (CFM)	-3	-5	-5
Actual Post Wx	<input type="text" value="Induced draft furnace/boiler vented with DWH"/>	CAZ Limit (Pascals)	-1.4	-0.8	-12.2
Flow Exponent	<input type="text" value="0.65"/>	Depressurization (Pascals)	<b>Back Draft Potential</b>		

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- Data Collection
- Diagnostic Tests
- Client Education
- Weatherization Assistant (WA) data entry

### 4.4.2 Measure Consideration

- Clean and Tune
- Heating Plant Replacement
- Electrically Commutated (EC) Motor
- ASHRAE 62.2-2013

### 4.4.3 Work Orders

- Change Orders

### 4.4.4 Manufactured Housing Requirements

- Codes
- Alterations

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.3.1 Change Orders

- **POLICY:** When the scope of work (measures or their costs) deviates from the Weatherization Service Agreement Form, a change order is required to reflect the updated scope of work. The Change Order Form must be included in the client file and requires a client's signature when a measure is added or deleted. A client signature is not needed when there is a change only in the cost of a measure.

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.3.1 Change Orders

- The audit in WA must be rerun with updated information when one of the following occurs:
  - Addition or deletion of an ECM
  - Change in cost of an ECM
  - Addition or deletion of an IRM
  - Change in cost of an IRM

# Section 4. Audit Event

## 4.4 Energy Audit

### 4.4.1 Site Visit

- Data Collection
- Diagnostic Tests
- Client Education
- Weatherization Assistant (WA) data entry

### 4.4.2 Measure Consideration

- Clean and Tune
- Heating Plant Replacement
- Electrically Commutated (EC) Motor
- ASHRAE 62.2-2013

### 4.4.3 Work Orders

- Change Orders

### 4.4.4 Manufactured Housing Requirements

- Codes
- Alterations - **No Changes**

# Section 4. Audit Event

## 4.5 Work Orders Issued to Contractors/Crews

### – 4.5.1 Work Standards and Materials

- **POLICY:** All weatherization materials must meet or exceed the specifications in 10 CFR 440, Appendix A, or be listed in the current DOE approved State Plan (Appendix A). **LED light bulbs**
- All work must be done in accordance with the Standard Work Specification (as stated in WPN 15-4), applicable state building codes, and manufacturer's specification.

# Section 4. Audit Event

## 4.5 Work Orders Issued to Contractors/Crews

### – 4.5.2 Warranty

- **POLICY:** Unless otherwise noted, labor and materials are warrantied for one year from the date of final inspection. Service Providers and clients should refer to **MN Statute 327A** for more information.

# Section 4. Audit Event

## 4.5 Work Orders Issued to Contractors/Crews

### – 4.5.3 Required Tests

- **POLICY:** Contractors will conduct and document the tests listed below when applicable for each home. The result will be included with the invoice.

# Section 4. Audit Event

## 4.5 Work Orders Issued to Contractors/Crews

### – 4.5.3.1 Mechanical Contractors

- Gas Pressure Test - on replacements, clean and tune, or repair
- Combustion Analysis/CO in Flue - on replacements, clean and tune, or repair
- CAZ Depressurization Test - at the end of each day on replacements, exhaust fan work, and any changes to building tightness
- Combustion Spillage Test – at the end of each day on replacements, clean and tune, or repair
- Duct Static Pressure Tests on replacements, clean and tune, or repair (3 tests)
- ASHRAE Fan Room Balancing Test - on fan installs in homes with non-forced air systems

# Section 4. Audit Event

## 4.5 Work Orders Issued to Contractors/Crews

### – 4.5.3.2 Building Shell Contractors/Crews

- Blower Door @ 50 Pa: pre and post
- Attic and Crawl Space Zonal Pressures: pre and post
- CAZ Depressurization Test: required at the end of each day
- Combustion Spillage Test: required at the end of each day
- Room-to-Room Pressure Balance: pre and post on homes with forced air systems
- ASHRAE Fan Room Balancing Test - on fan installs in homes with non-forced air systems

# Section 4. Audit Event

4.1 Definition

4.2 Types of Measures

4.3 Household File Contents

4.4 Energy Audit

4.5 Work Orders Issued to Contractors/Crews

**4.6 Quality Control Inspection**

**4.7 Callback Event**

# Section 4. Audit Event

## 4.7 Callback Event

### 4.7.1 DOE Callback

- **No Changes**

### 4.7.2 EAPWX Callback

- **Minor updates:**
  - email address
  - notification of state staff