

Steering Committee Meeting Notes from July 21, 2016 Teleconference

Meeting led by Lisa Rector of NESCAUM

Meeting Invitees (not all present on call): Lisa Rector (NESCAUM), Bob Lebens (WESTAR), Rob Kaleel (LADCO), Mary Uhl (WESTAR), Arthur Marin (NESCAUM), George Allen (NESCAUM), Rod Tinnemore (Washington), Phil Swartzendruber (Puget Sound Clean Air Agency), Cindy Heil (Alaska), Dave Shephard (Vermont), John Wakefield (Vermont), Lisa Herschberger (Minnesota), John Barnes (New York), Marc Cohen (Massachusetts), Jack Goldman (HPBA, President & CEO), John Crouch (HPBA, Public Affairs Director), Bob Ferguson (Consultant to HPBA, President of Ferguson, Andors & Company), Adam Baumgart-Getz (EPA OAQPS, Wood Heater NSPS Group Leader), Amanda Aldridge (EPA OAQPS, Wood Heater NSPS Lead), Stef Johnson (EPA OAQPS, Measurement Group Leader), Mike Toney (EPA OAQPS, Measurement Group), Jill Mozier (EPA's Contractor, Meeting Note Taker)

Primary Conclusions from Meeting:

- The Steering Committee (SC) membership consists of 9 votes, as follows:
 - Phil Swartzendruber and Rod Tinnemore (Washington State, 1 vote);
 - John Barnes (New York);
 - Cindy Heil (Alaska);
 - Marc Cohen (Massachusetts);
 - Lisa Herschberger (Minnesota);
 - Bob Lebens (WESTAR);
 - Lisa Rector (NESCAUM);
 - Bob Ferguson (Consultant to HPBA); and
 - Jack Goldman and John Crouch (HPBA, 1 vote).

The other meeting invitees listed above are participants, not voting members, including EPA.

- The SC decisions will be based on a simple majority of votes with a requirement for a quorum before any discussions/meeting may occur (i.e., if a call has less than a quorum, the call will be cancelled and re-scheduled). If a quorum exists but not all voting members are present on a call (or if the SC members need more time to consider the issues and their vote), voting will occur at the following week's meeting. The decisions requiring a vote will be e-mailed to the voting members not present to allow their input (e.g., via e-mail) before the vote takes place. Proxy voting is also allowed. When a decision is made and recorded, dissenting opinions will also be summarized for the record.
- The SC will meet weekly until the Operations & Fueling Work Group (O/F group) is set-up. Once the O/F group is set-up, the SC will meet monthly with more frequent meetings scheduled on an as-needed basis (e.g., when issues come up in either work group that the SC needs to discuss and decide in a timely fashion to keep the process moving). The hope is that weekly meetings of the SC will only be necessary through August and that monthly meetings will start in September.
- The O/F group will consist of two co-chairs – one regulator and one non-regulator – plus nominated members who agree to serve. The O/F group co-chairs will be nominated by the SC next week. After reviewing the names of nominees for the O/F group - including their

backgrounds and geographic representation, broadly speaking - the SC decided to nominate and invite the 17 names listed in the attachment to these notes ("Draft Guidelines for the Operations and Fueling Workgroup (O/F)" e-mailed by Lisa Rector to the SC prior to today's meeting). The O/F group may also include a facilitator in addition to the co-chairs, if an appropriate and available facilitator can be identified.

- The SC decided to keep the O/F group open to additional input from non-members and potentially to new members, so that all valuable information may be considered. Any proposed new O/F group members would need to be brought to the SC for nomination and confirmation.
- In addition to the O/F group members, the SC decided to reach out to external advisors as needed (e.g., Christof Schmidl of the European effort BeReal, U.S. forestry/wood species experts), as well as to brief people interested in the process who may have feedback for the SC (e.g., John Ackerly of The Alliance for Green Heat).
- The PM Measurement Work Group (PM group) expects to finish working through the issues relevant to its list of recommendations during next week's PM group meeting on July 27th. A final meeting will be held by early September to finalize and summarize the PM group's recommendations. These recommendations would then be reviewed by experts familiar with wood stove testing (e.g., labs) to determine if the recommendations are technically feasible as well as feasible from a cost perspective. Determination will also be made regarding whether any of these recommendations change the definition of the particulate matter being measured.
- The PM group has made the following preliminary list of recommendations, although some are still in process in terms of potential limits:
 - Switching to Emfab filters is reasonable;
 - A filter temperature range of 80-90EF is appropriate;
 - Tunnel flow rate should be reported;
 - Residence time should be reported;
 - Tunnel temperature should be reported;
 - Filter face velocity should be reported;
 - Pressure drop from filter loading should be reported;
 - Mass (PM) loading should be reported;
 - Chemical dilution ratio should be reported;
 - Post filter equilibration should move close to FRM (ambient desiccation);
 - Relative humidity (RH) should be reported and dew point of tunnel potentially controlled;
 - Cyclones are not an ideal way to deal with moisture in the tunnel, but ensuring no water/condensation in the tunnel is not trivial for some labs so further discussion is needed.
- The PM group is not generating data, but is rather making recommendations which could inform future data gathering. PM group meeting notes are being taken and will ultimately be available to all SC members, once final recommendations are made.

- A central website will be created for all 3 groups: a SC website, an O/F group website and a PM group website. These websites will serve as a repository for data and meeting notes.

To-Do List:

- Lisa Rector will draft an invitation letter for O/F group nominees and send it out to the SC for review.
- The SC will start developing a list of outside experts to help inform the O/F group's work, after finalizing the core membership of the O/F.
- The SC will discuss a briefing strategy for informing people who aren't participants in the O/F group or SC, but who may like to provide feedback to the group(s). The SC will discuss when such briefings should happen, how often they should happen and who will lead the briefings.
- Lisa Rector will discuss with the regulators a nominee for co-chair of the O/F group. HPBA will also decide on a nominee for co-chair of the O/F group. These names will be presented to the SC at next week's meeting.
- Amanda Aldridge will follow-up with Adam Baumgart-Getz and EPA regarding the possibility of using an EPA-trained facilitator for the O/F group.
- Lisa Rector will set up three *Basecamp* websites (<https://basecamp.com/>) to potentially be used as central repositories for the groups. The SC will decide if the *Basecamp* websites are suitable for this purpose next week.
- The SC members should review the attached document and edit or add-to as needed, in advance of next week's SC meeting. The SC will finalize the O/F group's framework next week.
- SC members should e-mail Lisa Rector any items for next week's agenda.

ATTACHMENT

Draft Guidelines for the Operations and Fueling Workgroup (O/F)

Revised July 21, 2016

- Objectives of the Work Group
 - Develop a cord wood certification fueling/operational protocol that more closely aligns in-use emissions performance with lab certification tests
 - Develop a method that ensures good emission performance in a variety of burn conditions –
 - Operating range of appliance
 - Fuel quality

- Membership
 - Decision-making
 - Decisions will be made by simple majority
 - Voting members have the capacity to be briefed before voting occurs
 - Membership of workgroup – a diverse and robust knowledge or skill set is desired for this group in order to capture a cord wood test that is more ‘real’ world but at the same time technically possible with respect to precision and reliability.
 - Total number of participants on the work group is still to be determined. The Steering Committee anticipates that the work group will be headed by 2- co-chairs. One chair should be a regulator.
 - Knowledge base for membership:
 - At least one member with knowledge of laboratory practices, either from a certified laboratory or academia
 - At least one member from each device-type manufacturer: catalytic and non-catalytic
 - As recommendations for the woodstove method are developed, presentations to other device stakeholders should be made to obtain feedback.
 - At least one member/expert in wood species
 - Membership should represent various geographic interests (East Coast, Midwest, West Coast, Northern regions/Arctic)
 - At least one member from EPA
 - Possibly a member from Europe
 - At least one member representing WESTAR and one member representing NESCAUM
 - Nominations (17 proposed below as members plus C. Schmidl and others TBD as advisors, if needed):
 - Lab
 - Rick Curkeet
 - Mark Champion
 - Tom Butcher
 - Ben Myren
 - Consultant
 - Bob Ferguson
 - Dan Henry

- Regulator
 - Rod Tinnemore
 - Lisa Rector
 - Bob Lebens
 - Marc Cohen
 - Cindy Heil
 - Lisa Herschberger
 - Randy Orr
 - Industry
 - Tom Morrissey
 - John Crouch
 - John Voorhees
 - Greg Achman
 - European Testing
 - Christoph Schmidl; expert advisor as needed
 - Nominations for workgroup chairs
- Criteria to Guide the Group
 - Quantify and improve operational stability and thereby improve the precision and accuracy of final PM measurement.
 - Increased correlation between lab tests and field performance
 - Identify elements of testing specified in the protocol and those determined by operating instructions
 - Structure test method to assess daily performance and annual performance emission rates
- Key issues for O/F Protocol
 - Fuel
 - Species
 - Address need for capacity/flexibility to conduct the testing worldwide
 - Quantify differences of using different species for certification testing?
 - Address impact of moving from a single species fuel to a multiple species/density fuel. Possible configurations include:
 - Single species
 - Mixed load
 - Test with multiple fuels, e.g. run 1 hardwood & run 2 softwood
 - Fuel characteristics
 - Fuel moisture range
 - Fuel density
 - Fuel piece sizing
 - Requirements for bark, knots, etc.
 - Fuel load weight and configuration
 - How much fuel
 - Fuel charge placement - benefits of standard versus random
 - Loading protocols – specified in the method, how scripted can manufacturer loading protocols be?

- Test 'cycle'
 - What are the key operational elements that the method should capture
 - Startup, steady state, idling, shutdown, others (?)
 - What should a test cycle look like
 - hot-to-hot, cold-to-hot, operational profile (scripted operation)
 - What is the duration of the test cycle (burn to zero or burn until emissions end). Should test runs have consistent definition of end and what should that definition be (*e.g.*, when 90% of fuel is consumed in order to eliminate charcoal tail and minimize duration)?
 - How many test runs
 - Operating range (for efficiency)?
 - Precision concerns may necessitate multiple runs
- Adjustments during test cycle
 - Appliance adjustments – can the appliance settings modifications be made during the test
 - Coal bed test parameters
 - Fuel charge adjustments:
 - Note: Cordwood burns in non-uniform patterns, sometimes forming arches that can collapse at odd intervals; accommodation is needed for this practical reality
- Precision
 - Need for replicate testing
- Appliance Operation - Specified procedures for air controls, etc.
 - What are the allowances for manufacturer's instructions
 - What stack height (and draft) should be specified or allowed during testing?
- Other measurements
 - Efficiency - ensure that method provides realistic efficiency values for consumers
 - What other emissions should be measured: CO, NO_x, VOC, PAH
- Possible Technical Presentations:
 - Fuel parameters/species variation lit review
 - Test methods
 - BeReal
 - ASTM
 - CSA
 - Consumer behavior
- Need to characterize potential impacts of recommendations
 - How does the change impact the result
 - How does the change impact cost of test
 - How does the change impact the ease of the test
 - How does the changes correlate to existing emission data set
- Data Analysis Considerations
 - How to design and analyze data to control for changes related to appliance technology versus test method changes
 - What data do we need versus what we have already

- Timeline
 - Summer 2016 develop and present recommendations on process and stakeholder outreach
 - Fall 2016 – develop data needs and identify key ranking criteria
 - 2017 – review data on existing and proposed test methods
 - Early 2018 – Draft recommendations
 - Summer 2018 – present recommendations to Steering Committee and EPA