

# HRR<sup>2</sup> Development Task Group

2011 March Materials Meeting  
Savannah, GA

Materials Working Group

Michael Burns, FAA Tech Center

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Federal Aviation  
Administration



# Agenda

- Brief History
- Variables That May Impact HRR Data
- Moving Forward
- Timeline / Future Work



# History

- **2010 June Materials Meeting**
  - Task Group Formed To Standardize OSU
- **2010 June - Questionnaire**
- **2010 August - Part 25 Announcement**
- **Request For Input To Update / Improve OSU (Short Timeframe)**
- **Combining Original Standardization Task Group and Part 25 Task Group**
- **October Conference – Kick Off Meeting**



# Variables That May Impact OSU Data (Apparatus)

- Thermopile Beads
- Construction
  - Upper Section, Overlaps, Chamber Body, Sample Holders, Incomplete Dimensions in Drawings
- Insulation
  - Density, Type, Sheathing
- Airflow

# Variables That May Impact OSU Data (Operational Procedures & Materials)

- Operator
- Heat Flux
- Calibration (Intervals)
- Maintenance
- Testing Procedures
- Software
- Materials



# WHERE WE GO FROM HERE?

DO NOT CHANGE ANYTHING

OR

1. Develop Plan To Eliminate / Reduce Variables
2. Develop Plan To Improve Repeatability / Reproducibility
3. Develop Plan To Standardize Operating Procedures / Equipment



# HRR<sup>2</sup> DEVELOPMENT PLAN

Sub Task Group #	Team Leader	Improvement Area
#1	Thermopile - <b>Martin Spencer</b> (Marlin Engineering) Globars - <b>Tim Earl</b> (GBH International / FTT)	<b>Thermopile, Globar/Heater Box</b>
#2	<b>Segundo Vargas</b> (Custom Scientific Instruments Inc.)	<b>Upper Section, Lower Section/Insulation</b>
#3	<b>Bill Mountain</b> (The Boeing Co.)	<b>Airflow, Air/Methane mixture, Specimens</b> <b>(Advance materials or materials that influence</b> <b>upper / lower pilot)</b>
#4	<b>Fred Schall</b> (Govmark Inc.) <b>Nimisha Kaul</b> (Weber Aircraft)	<b>Heat Flux, Material Baseline, Methane Gas</b> <b>Calibration/Performance</b>
#5	<b>Michael Miler</b> (Schneller, LLC.)	<b>Standardized Checklist / Operating Procedures,</b> <b>Update /Rewrite Handbook - Chapter 5</b>



# Sub Task Group #1

## Martin Spencer / Tim Earl

### ***Thermopile - Martin Spencer (Marlin Engineering)***

- Replacing beads with equivalent thermocouples (similar performance)
- Standardize Thermopile (full schematic)
- Standardize mounting method
- Develop specifications and detailed drawings

### ***Globar / Heater Box - Tim Earl (GBH International / FTT)***

- Standardize Globar Construction - Internal heating element
- Feasibility of replacing Globars with Newer Technology
- Standardize Dimensions / Construction
- Develop specifications and detailed drawings



## Sub Task Group #2

### Segundo Vargas (Custom Scientific Instruments Inc.)

#### ***Upper Section / Lower Section***

- Overlap Tolerances
- Standardized Construction - Cooling Manifold, Main Body, Viewing Window, Second Stage Plate Hole Pattern etc.

#### ***Insulation***

- Standardize Insulation Density / Type / Shrouding
- Develop specifications and detailed drawings

# Sub Task Group #3

## Bill Mountain (The Boeing Co.)

### ***Airflow***

- Separate Chamber / Cooling Airflow
- Feasibility of validating flows using anemometer
- Replace orifice plate/mercury manometer with sonic choke/pressure gage

### ***Air / Methane mixture – Upper / Lower Pilot***

- Feasibility of replacing air with 100% oxygen
- Standardize flame profile / flow rates

### ***Specimens*** (How to address the following issues)

- Swelling (covering lower pilot)
- Shrinking / Popping / delaminating / exploding specimens
- Dripping / Melting away from holder
- Fire Retardant (Effects on pilot flames)
- > 1.75” materials

## **Sub Task Group #4**

**Fred Schall (Govmark Inc.)**

**Nimisha Kaul (Weber Aircraft)**

### ***Heat Flux***

- Standardize method of setting heat flux – Steady State vs. Intermittent
- Standardize sample preheat location

### ***Material Baseline***

- Establish baseline of modern day aircraft materials (Pre / Post task group changes)

### ***Methane Gas Calibration / Performance Criteria***

## Sub Task Group #5

Michael Miler (Schneller, LLC.)

### ***Standardized Checklist / Operating Procedures***

- Conformity Inspection Criteria
- Hot / Cold Inspection
- Validation Of Software
- Interval Recommendations
- Sample Preparation
- Testing

### ***Update / Rewrite Handbook - Chapter 5***



# TEAM LEADERS

- **Initial Planning is underway To Tackle Issues**
- **Team Leaders Need Assistance!**
  - Sub Task Group Support Members
    - No limit on number of groups you can participate in
    - Notify Team Leaders
- **The FAA SharePoint Site has been established**
- **Team Leader Bi-Monthly Telecon's underway**
- **Timeline Proposal**
  - **11/11 [Complete HRR<sup>2</sup> Apparatus Development Plan](#)**
- **FAA Tech Center Old OSU Available for Prototype Development**



# Questions / Comments?

“Everyone has photographic memory; some just don't have the film”

Unknown Author

