

BOILER TUNING
REQUIREMENTS

NORB WRIGHT
*ENERGY & EFFICIENCY
CONSULTANT*

**CIBO TECHNICAL
COMMITTEE
MEETING**

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**THE COUNCIL OF
INDUSTRIAL BOILER
OWNERS**

REGULATORY BASIS

- MACT (MAXIMUM ACHIEVABLE CONTROL TECHNOLOGY) – MAJOR SOURCES
- GACT (GENERALLY AVAILABLE CONTROL TECHNOLOGY) - MINOR SOURCES
- BOTH CONTAIN TUNING REQUIREMENTS

MACT REQUIREMENTS

- APPLIES TO GAS (GAS 1) FIRED BOILERS OR PROCESS HEATERS
- DIFFERENTIATION BY HEAT INPUT:
 - LESS THAN 10 MMBTU/HR – BIENNIAL TUNE UP
 - GREATER THAN 10 MMBTU/HR – ANNUAL TUNE UP
- REQUIREMENTS:
 - BURNER INSPECTION
 - FLAME PATTERN INSPECTION
 - CONTROL SYSTEM INSPECTION
 - OPTIMIZE CO EMISSIONS
 - TUNE UP
 - RECORD:
 - CO EMISSIONS BEFORE AND AFTER THE TUNE UP ON A CONSISTENT BASIS, IE EITHER WET OR DRY
 - AND “DESCRIBE” ALL FINDINGS AND “CORRECTIVE ACTIONS” TAKEN DURING THE TUNE UP

GACT REQUIREMENTS

- GAS BOILERS NOT COVERED BY THIS RULE
- DIFFERENTIATION BY SIZE AND , IN PART, FUEL FIRED:
 - LESS THAN 10 MMBTU/HR HEAT INPUT – BIENNIAL TUNE UP
 - AFFECTS COAL,BIOMASS,OIL FIRED BOILERS
 - GREATER THAN 10 MMBTU/HR HEAT INPUT – ANNUAL TUNEUP
 - AFFECTS BIOMASS AND OIL FIRED BOILERS
- NEED TO SUBMIT A NOTIFICATION OF COMPLIANCE STATUS CONFIRMING THAT THE TUNE UP HAS BEEN COMPLETED
- SAMPLE, MULTIPLE PAGE, FORMS ARE AVAILABLE FOR RECORD KEEPING USE BY THE FACILITY THAT NEED NOT BE SUBMITTED BUT NEED TO BE RETAINED.

GACT REQUIREMENTS CONT'D

- REQUIREMENTS:
 - INSPECT THE BURNER
 - INSPECT THE FLAME PATTERN
 - INSPECT THE CONTROL SYSTEM
 - "OPTIMIZE" CO EMISSIONS
- RECORD:
 - CO EMISSIONS BEFORE AND AFTER THE TUNE UP ON A CONSISTENT BASIS , IE EITHER WET OR DRY
 - AND DESCRIBE ALL" FINDINGS" AND "CORRECTIVE ACTIONS" DURING THE COURSE OF THE TUNE UP

TUNING GUIDANCE – EPA/DOE

- EPA HAS UTILIZED THE DEPARTMENT OF ENERGY (DOE) TO DEVELOP A BOILER TUNING GUIDANCE DOCUMENT
- GIVEN THE DIVERSITY OF THE BOILER POPULATION:
 - THE GUIDE WILL INHERENTLY BE MORE GENERALIZED RATHER THAN SPECIFIC IN NATURE
 - EACH FACILITY WILL NEED TO “TAILOR” THE GUIDE TO CONFORM TO THE INSTALLED BOILERS AND BOILER COMBUSTION CONTROL SYSTEMS.

TUNING GUIDANCE – EPA/DOE CONT'D

- IT IS CIBO'S UNDERSTANDING THAT:
 - DOE HAS CONTRACTED WITH AN OUTSIDE CONSULTANT TO DEVELOP THE GUIDE
 - THE GUIDE IS IN THE FINAL STAGES OF DEVELOPMENT AND IS EXPECTED TO BE ISSUED "SOON"
 - THE GUIDE WILL PROBABLY BE REFERENCED IN SOME MANNER BY MACT

TUNING GUIDANCE – CIBO

- CIBO WILL REVIEW AND COMMENT ON THE DOE TUNING DOCUMENT ONCE IT IS AVAILABLE TO THE PUBLIC
- CIBO WILL PREPARE ADDITIONAL TUNING RECOMMENDATIONS THAT ARE:
 - GENERALIZED IN NATURE DUE TO THE DIVERSITY OF BOILERS AND COMBUSTION CONTROL SYSTEMS IN USE
 - RELATIVELY BRIEF
- CIBO WORK WOULD COMMENCE ONCE THE DOE GUIDE IS AVAILABLE

INTERIM TUNING PROGRAM SUGGESTIONS

- TUNING MUST BE DONE IN A SAFE MANNER BY TRAINED, EXPERIENCED, TECHNICALLY COMPETENT PERSONEL FAMILIAR WITH THE BOILER BEING TUNED AND THE CONTROL SYSTEM.
- BEFORE TUNING COMMENCES:
 - DEVELOP WRITTEN PROCEDURES THAT CONTAIN BOILER AND EMISSION LIMIT DATA
 - EVALUATE WHERE TO SAMPLE FLUEGAS
 - FIND A "HOME" FOR THE STEAM AT HIGH LOADS
 - ASSIGN ROLES & RESPONSIBILITIES
 - VET THE TUNERS AND GET A FIRM PRICE WITH COSTS FOR ADDITIONAL WORK/HOURS

INTERIM TUNING PROGRAM SUGGESTIONS (CONT'D)

- DURING THE TUNING:
 - TUNE ACROSS THE BOILERS DESIGN FIRING RANGE
 - CHECK MINIMUM FIRE FOR STABILITY ,REPEATABILITY AND PERCENT OF FULL LOAD
 - CHECK FLUEGAS COMBUSTIBLE/CO AND O2 LEVELS AT EACH LOAD POINT
 - EVALUATE ECONOMIZER/AIR HEATER PERFORMANCE
 - CHECK FLAME PATTERN/BED DEPTH/ GRATE CONDITION AS APPROPRIATE
 - INSURE FGR, IF USED, IS OPERATING PROPERLY
 - MAKE SURE THE TUNING IS CONSISTENT WITH EMISSIONS LIMITS
 - FOR LIQUID FUELS CONFIRM GUN IS PROPERLY ASSEMBLED WITH CLEAN CORRECTLY ORIENTED TIPS
 - CONFIRM LIQUID FUEL ATOMIZATION SYSTEM OPERATING PROPERLY

INTERIM TUNING PROGRAM SUGGESTIONS (CONT'D)

- **AFTER THE TUNING:**
 - **CONFIRM ALL DATA PROPERLY RECORDED AND REGULATORY REQUIREMENTS MET**
 - **MOVE BOILER THROUGH OPERATING RANGE TO CONFIRM SYSTEM RESPONDS WITHOUT ISSUES**
 - **OBTAIN TUNING DATA FROM TUNER, IN ROUGH DRAFT FORM , BEFORE TUNER LEAVES SITE**