

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III – CONTROL OF AIR CONTAMINANTS**

**RULE 323
FUEL BURNING EQUIPMENT FROM
INDUSTRIAL/COMMERCIAL/INSTITUTIONAL (ICI) SOURCES**

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**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III-CONTROL OF AIR CONTAMINANTS**

RULE 323

**FUEL BURNING EQUIPMENT FROM INDUSTRIAL/COMMERCIAL/INSTITUTIONAL (ICI)
SOURCES**

SECTION 100 – GENERAL

101 PURPOSE: To limit the discharge of nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter emissions into the atmosphere from fuel burning combustion units at industrial and/or commercial and/or institutional (ICI) sources.

102 APPLICABILITY: This rule applies to the following types of combustion units that burn either fossil fuels or alternative fuels:

102.1 Each boiler or steam generating unit that has a maximum design rated heat input capacity greater than 10 million (MM) British thermal units per hour (Btu/hr).

102.2 Each stationary gas turbine with a heat input at peak load equal to or greater than 10 MMBtu/hr.

102.3 Each cogeneration steam generating unit with a heat input of greater than 10 MMBtu/hr.

102.4 Each indirect-fired process heater with a heat input greater than 10 MMBtu/hr.

102.5 NSPS & NESHAP: In addition to this rule, facilities may be subject to New Source Performance Standards (NSPS) in Rule 360 and/or National Emission Standards for Hazardous Air Pollutants (NESHAP) in Rule 370 of these rules.

103 EXEMPTIONS: This rule shall not apply to the following types of equipment:

103.1 Incinerators, crematories, or burn-off ovens; or

103.2 Dryers, cement, and lime kilns; or

103.3 Direct-fired process heaters; or

103.4 Medical waste incinerators; or

103.5 Reciprocating internal combustion engines; or

103.6 Combustion equipment used in power plant operations for the purpose of supplying greater than one third of the electricity to any utility power distribution system for sale; or

103.7 Combustion equipment associated with nuclear power plant operations; or

103.8 Water heaters used for the sole purpose of heating water for comfort or for radiant heat; or

103.9 Municipal solid waste landfill enclosed combustors and non-enclosed flares.

104 PARTIAL EXEMPTIONS:

- 104.1** Stationary gas turbines listed in Section 102.2 of this rule that are used for any of the following reasons shall be exempt from Sections 301, 304, and 305, of this rule:
- a. Used for firefighting; or
 - b. Used for flood control; or
 - c. Engaged by manufacturers in research and the development of equipment for either gas turbine emission control techniques or gas turbine efficiency improvements.
- 104.2** All combustion units that are normally fired with natural gas shall be exempt from Sections 301, 304, 305, and 501.1 of this rule while firing emergency fuel during a natural gas curtailment or a natural gas emergency. For combustion units located at a major stationary source of nitrogen oxides, this exemption shall not exceed 168 hours per calendar year per combustion unit, excluding hours of operation for testing, reliability, training, and maintenance.
- 104.3** All combustion units that are normally fired with natural gas shall be exempt from Sections 301, 304, 305, and 501.1 of this rule while firing emergency fuel for the purposes of testing, reliability, training, and maintenance. This exemption shall not exceed 36 hours per calendar year per combustion unit, excluding hours of operation during natural gas curtailments and natural gas emergencies.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply, in addition to those definitions found in Rule 100 (General Provisions and Definitions) of these rules. In the event of any inconsistency between any of the Maricopa County air pollution control rules, the definitions in this rule take precedence.

- 201 ALTERNATIVE FUELS:** Substitutes for traditional oil-derived and fossil-fuel derived motor vehicle fuels including but not limited to biodiesel, propane, ethanol, methanol, or waste derived fuel gas.
- 202 ANNUAL HEAT INPUT:** The actual total heat input of fuels combusted in a unit during a calendar year, as calculated based on the amount of each fuel combusted and the higher heating value of each fuel. Annual heat input shall not include the heat input from emergency fuel combusted during natural gas curtailments and natural gas emergencies or emergency fuel combusted for purposes of testing, reliability, training, and maintenance as long as the usage limits in Sections 104.2 and 104.3 are not exceeded.
- 203 BOILER:** A device that combusts any fossil fuel or alternative fuel and recovers thermal energy to heat water or another material.
- 204 COGENERATION STEAM GENERATING UNIT:** Any device that is fired with fossil fuels or alternative fuels and simultaneously produces both useful thermal energy (such as heat or steam) and either electrical or mechanical energy from the same primary energy source.

- 205 COMBUSTION CONTROL SYSTEM:** Equipment or technology, such as water injection or low-NO_x burners, that reduce the formation of nitrogen oxides during combustion of fossil fuels or alternative fuels.
- 206 COMBUSTION UNIT:** Any boiler, steam generating unit, stationary gas turbine, cogeneration steam generating unit, or indirect-fired process heater listed in Section 102 of this rule.
- 207 CONTINUOUS EMISSIONS MONITORING SYSTEM (CEMS):** The total equipment required to sample, analyze, measure, and provide a permanent record of emissions by means of readings recorded at least once every 15 minutes (using an automated data acquisition and handling system (DAHS)).
- 208 CORRECTIVE ACTION PLAN (CAP):** A methodical procedure that is used to evaluate and correct a turbine operational problem and that includes, at a minimum, improved preventative maintenance procedures, improved ECS operating practices, possible operational amendments, and progress reports.
- 209 EMERGENCY FUEL:** Fuel fired only for purposes of testing, reliability, training, and maintenance or during circumstances such as a natural gas emergency or a natural gas curtailment, or breakdown of delivery system such as an unavoidable interruption of supply that makes it impossible to fire natural gas in the combustion unit. Fuel is not considered emergency fuel if it is used to avoid either peak demand charges or high gas prices during on-peak price periods or due to a voluntary reduction in natural gas usage.
- 210 EMISSION CONTROL SYSTEM (ECS):** Post-combustion systems that are approved in writing by the Control Officer and are designed and operated in accordance with good engineering practice to reduce emissions from combustion equipment. A combustion control system is not an emission control system.
- 211 FOSSIL FUEL:** Naturally occurring carbonaceous substances from the ground such as natural gas, petroleum, coal, and any form of solid, liquid or gaseous fuel derived from such material for the purpose of creating energy.
- 212 GAS TURBINE:** A rotary engine driven by the expansion of hot gases that are generated by the combustion of fuel.
- 213 HEAT INPUT:** Heat derived from the combustion of fuel not including the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, and kilns.
- 214 LOW SULFUR OIL:** Fuel oil containing less than or equal to 0.05% sulfur by weight.
- 215 NATURAL GAS CURTAILMENT:** A shortage in the supply of natural gas, due solely to limitations or restrictions in distribution pipelines by the utility supplying the gas and not due to the cost of natural gas.
- 216 OPACITY:** A condition of the ambient air, or any part thereof, in which an air contaminant partially or wholly obscures the view of an observer.

- 217 **OPERATING HOUR:** A clock hour during which a unit combusts fuel, either for part of the hour or for the entire hour.
- 218 **PARTICULATE MATTER EMISSIONS:** Any and all particulate matter emitted to the ambient air as measured by applicable state and federal test methods.
- 219 **PARTS PER MILLION BY VOLUME DRY (PPMVD):** A unit of proportion used to express concentration that is corrected to a dry basis.
- 220 **PEAK LOAD:** 100% of the manufacturer's design capacity of a gas turbine at 288° Kelvin, 60% relative humidity, and 101.3 kilopascals pressure (ISO 3977 standard reference conditions and ratings).
- 221 **PROCESS HEATER:** An enclosed combustion device that uses controlled flame to transfer heat to a process fluid or a process material that is not a fluid or to heat transfer material for use in a process unit (not including the generation of steam). A process heater may be either indirect or direct-fired, dependent upon whether the gases of combustion mix with and exhaust to the same stack or vent (direct-fired) with gases emanating from the process material or not (indirect-fired). Emissions from indirect-fired units consist entirely of products of combustion while emissions from direct-fired units are unique to the given process and may vary widely in any industrial process. A process heater is not an oven or kiln used for drying, curing, baking, cooking, calcining, or vitrifying.
- 222 **RATED HEAT INPUT CAPACITY:** The heat input capacity as specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified so that its maximum heat input is different than the heat input capacity on the nameplate (design heat capacity), the maximum heat input shall be considered as the rated heat input capacity.
- 223 **STATIONARY GAS TURBINE:** Any gas turbine that is not self-propelled or that is attached to a foundation.
- 224 **STEAM GENERATING UNIT:** A device that combusts any fossil fuel or alternative fuel and produces steam or heats water or heats any heat transfer medium.
- 225 **SULFUR OXIDES (SO_x):** The sum of the oxides of sulfur emitted from the flue gas from a combustion unit that are directly dependent upon the amount of sulfur in the fuel used.
- 226 **ULTRA LOW SULFUR OIL:** Fuel oil containing less than or equal to 0.0015 % sulfur by weight.
- 227 **UNCOMBINED WATER:** Condensed water containing no more than analytical trace amounts of other chemical elements or compounds.
- 228 **WASTE DERIVED FUEL GAS:** A gaseous fuel that is generated from the biodegradation of solid or liquid waste including, but not limited to, digester gas and landfill gas.
- 229 **WATER HEATER:** A closed vessel in which water is heated by combustion of fuel and water is either withdrawn for use external to the vessel (at pressures not exceeding 160 psi

with all controls and devices preventing water temperatures from exceeding 210°F) or used for radiant heat. Water heaters are usually no larger than 1 MM Btu/hr and do not reach temperatures of 220°F and higher.

SECTION 300 – STANDARDS

- 301 LIMITATIONS – PARTICULATE MATTER:** An owner or operator of any combustion unit with either a rated heat input capacity or heat input greater than 100 MMBtu/hr shall not discharge, cause, or allow the discharge of particulate matter emissions, caused by combustion of non-gaseous liquid fuels or a blend of liquid fuels with other fuels, in excess of 0.10 pounds/MMBtu.

- 302 LIMITATIONS – OPACITY:** An owner or operator shall not discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity.

- 303 LIMITATIONS – SULFUR IN FUEL:** An owner or operator of any combustion unit that burns fuel oil or a mixture or blend of fuel oil with any other fuels shall use only ultra low sulfur oil. An existing supply of low sulfur oil purchased or obtained prior to November 2, 2016 may be used until depleted. An owner or operator of any combustion unit that burns waste derived fuel gas shall use only waste derived fuel gas that contains no more than 0.08% sulfur by weight, alone or in combination with other fuels.

- 304 LIMITATIONS – NITROGEN OXIDES:** An owner or operator of any combustion unit shall comply with the subsections specified in Table 323-1.

TABLE 323-1

FOR COMBUSTION UNITS THAT ARE NOT LOCATED AT A MAJOR SOURCE OF NITROGEN OXIDES:	THE OWNER OR OPERATOR SHALL COMPLY WITH:
Stationary gas turbines	304.1 and 304.2
Combustion units (>100 MMBtu/hr) except stationary gas turbines	304.3
Combustion units (≤ 100 MMBtu/hr) except stationary gas turbines	304.1 or 304.2 or 304.4*
FOR COMBUSTION UNITS THAT ARE LOCATED AT A MAJOR SOURCE OF NITROGEN OXIDES:	THE OWNER OR OPERATOR SHALL COMPLY WITH:
Stationary gas turbines	304.1 and 304.2
Combustion units (> 100 MMBtu/hour) except stationary gas turbines	304.3
Combustion units (> 50 MMBtu/hour and ≤ 100 MMBtu/hour) except stationary gas turbines	304.2

TABLE 323-1

Combustion units (> 10 MMBtu/hour and ≤ 50 MMBtu/hour with annual heat input ≥ 220,000 therms) except stationary gas turbines	304.2 or 304.4*
Combustion units (> 10 MMBtu/hour and ≤ 50 MMBtu/hour with annual heat input < 220,000 therms) except stationary gas turbines	304.1 or 304.2 or 304.4*

* The RACT tuning procedures in Section 304.4 are not appropriate for combustion units equipped with Low-NO_x burners or burners utilizing a premix flame.

304.1 Baseline Monitoring and Annual Tuning:

- a. Establish and record the initial optimal baseline concentrations for NO_x and CO within 90 days of the first usage of the combustion unit utilizing the initial design burner specifications or manufacturer’s recommendations to ensure good combustion practices. The initial design burner specifications or manufacturer’s recommendations shall be kept onsite and available to the Control Office upon request.
- b. Tune the combustion unit annually in accordance with the manufacturer’s recommended procedure. The manufacturer’s recommended procedures shall be kept onsite and available to the Control Officer upon request. For low emission burner systems that do not provide accessibility for combustion chamber inspection, burner inspection, or inspection of the flame pattern, an owner or operator shall provide documentation from the manufacturer and follow the manufacturer’s recommended procedure. If the manufacturer’s recommended tuning procedure is not available, the owner or operator shall tune the combustion unit annually by following, at a minimum, the steps listed in 304.1b.(1) – (5), if the combustion unit is so equipped, and if such procedures are appropriate to the type of combustion unit:
 - (1) Inspect the burner system and clean and replace any components of the burner as necessary to minimize emissions of NO_x and CO; and
 - (2) Inspect the burner chamber for areas of impingement and remove if necessary; and
 - (3) Inspect the flame pattern and make adjustments as necessary to optimize the flame pattern; and
 - (4) Inspect the system controlling the air-to-fuel ratio and ensure that it is correctly calibrated and functioning properly; and
 - (5) Using a portable monitor, measure the NO_x and CO concentration of the effluent stream after each adjustment is made to ensure optimal baseline concentrations are maintained.

304.2 RACT Emission Limits: Limit nitrogen oxide emissions to no more than the following amounts:

- a. Stationary Gas Turbines:

(1) 42 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning gaseous fuel.

(2) 65 ppmvd corrected to 15% oxygen calculated as nitrogen dioxide, when burning liquid fuel.

b. All Combustion Units Except Stationary Gas Turbines:

(1) 30 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning gaseous fuel.

(2) 40 ppmvd corrected to 3% oxygen calculated as nitrogen dioxide, when burning liquid fuel.

304.3 Semi-Annual Tuning and RACT Emission Limits:

a. Tune the combustion unit every 6 months in accordance with the manufacturer's recommended procedure or in accordance with the procedures listed in Section 304.1.b(1) through (5) of this rule and;

b. Meet the RACT emission limits as stated in Section 304.2 of this rule.

304.4 RACT Tuning Procedures: Tune the combustion unit every 12 months using the procedure in Appendix A of this rule that is appropriate for the combustion unit.

305 LIMITATIONS-CARBON MONOXIDE: An owner or operator of any combustion unit with a heat input greater than 100 MMBtu/hr shall not cause to be discharged into the atmosphere, carbon monoxide (CO), measured in excess of 400 ppmvd corrected to 15% oxygen for Stationary Gas Turbines, and corrected to 3% oxygen for all Combustion Units Except Stationary Gas Turbines.

306 GOOD COMBUSTION PRACTICES FOR STATIONARY GAS TURBINES: The owner or operator of any stationary gas turbine listed in Section 102.2 of this rule shall, regardless of fuel type, use operational practices recommended by the manufacturer to ensure good combustion control. The owner or operator of any stationary gas turbine listed in Section 102.2 of this rule shall demonstrate good combustion control using the parametric monitoring method listed below, or by operating a continuous emissions monitoring system to demonstrate compliance with the limits in Sections 304 and 305 of this rule, as applicable.

306.1 Monitor the maximum temperature differential across the combustion burners or at locations around the back end of the turbine, dependent upon the particular unit, to ensure no more than a 100°F difference using a thermocouple. Differential temperatures shall be measured and recorded at least once during every operating hour. If a temperature differential of greater than 100°F is observed across the burners, investigation and corrective action shall be taken within three hours to reduce the temperature difference to 100°F or less.

306.2 If the manufacturer recommends that the maximum numerical temperature differential to ensure good combustion is greater than 100°F, then proof of this maximum alternate temperature differential shall be submitted to the Control Officer. The procedure to measure the maximum temperature differential listed in Section 306.1 of this rule shall then be followed using this alternate recommended maximum temperature differential after approval by the Control Officer.

306.3 If the differential temperature exceeds 100°F, or the alternate temperature differential recommended by the manufacturer and approved by the Control Officer, during three consecutive operating hours, the operator shall comply with the recordkeeping requirements in Section 501.3 of this rule. If this occurs more than 3 times in 3 months, the owner or operator shall notify the Control Officer in writing within 2 business days and the Control Officer shall require the owner or operator to submit a Corrective Action Plan (CAP).

307 REQUIREMENTS FOR ECS AND ECS MONITORING EQUIPMENT: If an ECS is operated during a performance test required by Section 503 of this rule, the owner or operator shall:

307.1 Properly install, operate, and maintain in calibration and in good working order, devices for indicating temperatures, pressures, transfer rates, rates of flow, or other operating conditions necessary to determine if air pollution control equipment is functioning properly and is properly maintained.

307.2 Submit to the Control Officer for approval an Operation and Maintenance (O&M) Plan for any ECS and any ECS monitoring devices that are used pursuant to this rule or to an air pollution permit. The O&M Plan shall include:

- a. ECS equipment manufacturer; and
- b. ECS equipment model; and
- c. ECS equipment identification number; and
- d. Operating parameters that will be monitored to demonstrate continued operation of the ECS in the manner the ECS was operated during the most recent performance test; and
- e. The manufacturer's recommended maintenance procedures and frequencies or, if the manufacturer's recommended maintenance procedures are not available, a maintenance plan based on good engineering practice to reduce emissions.

307.3 Provide and maintain readily available on-site at all times the O&M Plan(s) for any ECS and ECS monitoring devices that are used under this rule or an air pollution control permit.

307.4 Fully comply with all the identified actions and schedules provided in the most recent version of the O&M Plan submitted to the Control Officer, unless notified by the Control Officer in writing.

307.5 Submit a revised O&M Plan within 30 business days following receipt of the Control Officer's notice that an O&M Plan for any ECS, including any ECS monitoring device, is deficient or inadequate.

308 EMERGENCY FUEL USE NOTIFICATION: Each time a combustion unit is fired with emergency fuel, the owner or operator shall provide written notification to the Control Officer within 2 business days after combustion of emergency fuel begins. The written notification shall include a description of the emergency that necessitated the use of emergency fuel, the date that combustion of emergency fuel began, and the expected

duration of the emergency fuel usage. The written notification may be submitted by mail, email, fax, commercial delivery, or hand delivery.

SECTION 400 – ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE FOR PERFORMANCE TESTING: The owner or operator of any combustion unit that becomes subject to the emission limits in Section 304.2 of this rule on or after June 23, 2021 shall comply with following compliance schedules, as applicable, and the associated deadlines for demonstrating compliance.

401.1 Performance Test: The owner or operator shall demonstrate compliance with the applicable emission limits within 6 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule. This requirement shall not apply to a combustion unit if modifications to an ECS or installation of an ECS is required to achieve compliance with the applicable emission limits and the owner or operator is in compliance with the applicable schedule in Section 401.3 or 401.4 of this rule.

401.2 O&M Plan: If different operating parameters or ECS maintenance procedures or schedules are used to achieve compliance with the emission limits in Section 304.2 of this rule, the owner or operator of the combustion unit shall submit a revised O&M Plan in accordance with Section 307 of this rule within 30 days after completion of the performance test required by Section 401.1 of this rule.

401.3 Modifications to Existing ECS: If it is necessary to modify an ECS by either reconstructing or adding on equipment, an owner or operator shall submit to the Control Officer a schedule for modification of the ECS within 6 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule. The schedule shall show how the ECS is to be used to achieve full compliance and shall specify dates for completing increments of progress. The owner or operator shall complete ECS modifications and demonstrate compliance with the applicable NO_x emission limits within 12 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule.

401.4 ECS Installation: If installation of an ECS is necessary to achieve compliance with numeric emission limits in this rule, an owner or operator shall submit to the Control Officer a schedule for installation of the ECS within 6 months after the equipment becomes subject to the emission limits in Section 304.2 of this rule. The owner or operator shall complete the installation of an ECS and demonstrate compliance with the applicable NO_x emission limits within 36 months after the combustion unit becomes subject to the emission limits in Section 304.2 of this rule.

402 COMPLIANCE SCHEDULE FOR RACT TUNING PROCEDURE: The owner or operator of any combustion unit that becomes subject to the requirements of Section 304.4 of this rule on or after June 23, 2021 shall complete the RACT tuning procedure within 6 months after the combustion unit becomes subject to Section 304.4 of this rule.

SECTION 500 – MONITORING AND RECORDS

- 501 RECORDKEEPING AND REPORTING:** An owner or operator of a combustion unit shall comply with the requirements set forth in this section. Any records and data required by this section shall be kept on site at all times in a consistent and complete manner and be made available without delay to the Control Officer or his designee upon request. Records shall consist of the following information:
- 501.1 Combustion Units:** Monthly records of type and amount of fuel used, and the sulfur content of any liquid fuel or waste derived fuel gas combusted.
 - 501.2 Emergency Fuel Usage:** Monthly records of type and amount of emergency fuel used, the sulfur content of the fuel, dates and hours of operation using emergency fuel, and nature of the emergency or purpose for the use of the emergency fuel as stated in Sections 104.2 and 104.3. Yearly records of the twelve month log of hours of operation using emergency fuel.
 - 501.3 Good Combustion Practice:** Measurements of the temperature differential across the burners of turbines per Section 306 of this rule, results of evaluation and corrective action taken to reduce the temperature differential or a finding that the temperature differential returned to the range listed in Sections 306.1 or 306.2 of this rule without any action by the owner or operator.
 - 501.4 Baseline Monitoring and Annual Tuning Procedure:** Date that the procedure was performed on the particular combustion unit and at a minimum: stack gas temperature, flame conditions, nature of the adjustment and results of the nitrogen oxide and carbon monoxide concentrations obtained by using a portable monitor after each adjustment.
 - 501.5 RACT Tuning Procedure:** Date the procedure was performed, the final control settings that reflect optimized combustion, the firing rate during the tuning procedure, a record of all adjustments and cleaning procedures, and a record of all operating parameters specified in Appendix A.
 - 501.6 Operation & Maintenance Records:** On each day an ECS operates, record the ECS operating parameters described in the O&M Plan. Record all maintenance actions taken within 24 hours of maintenance completion. An explanation shall be recorded for any scheduled maintenance that is not performed during the period designated in the O&M Plan.
 - 501.7 Continuous Emission Monitoring Systems:** All CEMS measurements, results of CEMS performance evaluations, CEMS calibration checks, and adjustments and maintenance performed on these systems.
- 502 RECORDS RETENTION:** Copies of reports, logs and supporting documentation required by the Control Officer shall be retained for at least 5 years. Records and information required by this rule shall also be retained for at least 5 years.
- 503 COMPLIANCE DEMONSTRATION:**
- 503.1 Sulfur Verification:**
 - a. Ultra Low Sulfur Oil:** If the Control Officer requests documentation of the sulfur content of the fuel to demonstrate the 0.0015% limit, the owner or operator shall submit one of the following:

- (1) Fuel receipts, or
- (2) Contract specifications, or
- (3) Pipeline meter tickets, or
- (4) Fuel supplier information, or
- (5) Purchase records, or
- (6) Analytical results listing the sulfur content of the fuel, the test method conducted, and evidence that appropriate chain of custody procedures were followed.

The items listed above must provide accurate sulfur content values and be based on enforceable test methods as approved by the Administrator to determine the sulfur content.

- b. **Waste Derived Fuel Gas:** The owner or operator shall submit documentation of the sulfur content of the waste derived fuel gas to the Control Officer upon request. The sulfur content of gaseous fuels shall be determined by South Coast Air Quality Management District Method 307-91 Determination of Sulfur in a Gaseous Matrix.
- c. **Purchase Documentation of Existing Low Sulfur Oil:** The owner or operator shall maintain documentation of the purchase date of any low sulfur oil on site to demonstrate the oil was purchased prior to November 2, 2016.

503.2 Source Test Requirements: The owner or operator of any combustion unit that is subject to numeric emission limits in Section 301, 304 and/or 305 of this rule shall conduct performance tests at least once every 5 years. The result of the performance test shall be the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. In addition, the owner or operator shall comply with the following requirements:

- a. Nitrogen oxides shall be measured using EPA Reference Method 7 or 7E and carbon monoxide shall be measured using EPA Reference Method 10, as incorporated by reference in Section 504 of this rule. For stationary gas turbines, nitrogen oxides and carbon monoxide shall be measured dry and corrected to 15% oxygen. For all other combustion units, nitrogen oxides and carbon monoxide shall be measured dry and corrected to 3% oxygen.
- b. Particulate matter shall be measured using EPA Reference Method 5, or another EPA-approved test method designated by the Control Officer. A back-half analysis shall be performed using Reference Method 202 each time a performance test is required.
- c. The owner or operator may demonstrate compliance with applicable emission limits by conducting representative performance testing if all of the following requirements are satisfied:
 - (1) All combustion units in the specified group were produced by the same manufacturer, have the same model number or other manufacturer's designation in common, and have the same rated heat input capacity and operating specifications;

- (2) All combustion units in the specified group are operated and maintained in a similar manner;
- (3) At least one combustion unit or one-third of the combustion units in the specified group, whichever is greater, are tested each time a performance test is required;
- (4) Each time a performance test is required, different combustion units are tested so that all combustion units in the specified group are tested before any combustion units in the specified group are retested; and
- (5) If emissions from any combustion unit in the specified group exceed an applicable emission limit the owner or operator shall conduct a performance test on each unit in the specified group to demonstrate that each combustion unit in the specified group is in compliance with the applicable emission limit.

503.3 Gaseous Emissions-Continuous Emission Monitoring System (CEMS):

Compliance with the emission requirements specified in Sections 301 through 305 of this rule may also be determined using CEMS. Where the combustion unit(s) are equipped with CEMS:

- a. **General:** All CEMS must be installed according to the procedures specified in 40 CFR 60.13(g). All CEMS shall be installed such that a representative measurement of emissions is obtained. Additional procedures for the location of CEMS found in 40 CFR 60, Appendix B shall be used. The data recorder for CEMS shall be in operation at all times the combustion unit is operated.
- b. **Cycle Time:** An owner or operator of any combustion unit using a CEMS shall ensure that the CEMS completes a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.
- c. **Calibration:** Zero and span shall be checked once every 24 hours. The CEMS shall be calibrated in accordance with the manufacturer's specifications.
- d. **Averaging:** The data recorded during periods of calibration checks, zero and span adjustments shall not be included in averaging for compliance determinations. Compliance shall be determined on an hourly basis using the average of the three previous 1-hour average emissions concentrations. The 1-hour average emissions concentration shall be determined from at least two data points recorded by the CEMS.
- e. **Quality Assurance:** The owner or operator of the CEMS shall fully comply with 40 CFR 60, Appendix F.

504 COMPLIANCE DETERMINATION-TEST METHODS INCORPORATED BY REFERENCE: The following test methods are approved for use for the purpose of determining compliance with this rule. The test methods are incorporated by reference in Rule 360 and Appendix G of the Maricopa County Air Pollution Control Regulations. Alternative test methods as approved by the Administrator or other EPA-approved test methods may be used upon written approval from the Control Officer. When more than one test method is permitted for the same determination, an exceedance under any method

will constitute a violation. Copies of test methods referenced in this section are available at the Maricopa County Air Quality Department.

- 504.1** EPA Reference Methods 1 (“Sample and Velocity Traverses for Stationary Sources”), and 1 A (“Sample and Velocity Traverses for Stationary Sources with Small Stacks and Ducts”) (40 CFR 60, Appendix A).
- 504.2** EPA Reference Methods 2 (“Determination of Stack Gas Velocity and Volumetric Flow Rate”), 2A (“Direct Measurement of Gas Volume through Pipes and Small Ducts”), 2C (“Determination of Stack Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts”), and 2D (“Measurement of Gas Volumetric Flow Rates in Small Pipes and Ducts”) (40 CFR 60, Appendix A).
- 504.3** EPA Reference Methods 3 (“Gas Analysis for the Determination of Dry Molecular Weight”), 3A (“Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)”), 3B (“Gas Analysis for the Determination of Emission Rate Correction Factor or Excess Air”), and 3C (“Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.4** EPA Reference Method 4 (“Determination of Moisture Content in Stack Gases”) (40 CFR 60, Appendix A).
- 504.5** EPA Reference Method 5 (“Determination of Particulate Emissions from Stationary Sources”) (40 CFR 60, Appendix A)
- 504.6** EPA Reference Method 202 (“Dry Impinger Method for Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).
- 504.7** EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”) and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Instrumental Analyzer Procedure”), (40 CFR 60, Appendix A).
- 504.8** EPA Reference Method 9, (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.9** EPA Reference Method 10, (“Determination of Carbon Monoxide from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.10** EPA Reference Method 20, (“Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines”) (40 CFR 60, Appendix A).
- 504.11** ASTM Method D2622-05, (“Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry”).
- 504.12** ASTM Method D2880-96 (“Standard Specification for Gas Turbine Fuel Oils”).
- 504.13** ASTM Method D4294-02 or D4294-03, (“Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectrometry”).
- 504.14** ASTM Method D5504-01 or D5504-08, (“Standard Test Method for Determination of Sulfur compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence”).

504.15 South Coast Air Quality Management District Method 307-91 (“Determination of Sulfur in a Gaseous Matrix”), revised 1994.

APPENDIX A TO RULE 323 RACT TUNING PROCEDURES

Nothing in these equipment tuning procedures shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation of requirement established by Factory Mutual, Industrial Risk Insurers, National Fire Prevention Association, the Industrial Commission of Arizona (Arizona Division of Occupational Safety and Health), the Federal Occupational Safety and Health Administration, or other relevant regulations and requirements. Steps in these procedures that are not applicable to specific combustion units may be omitted.

Tuning Procedure for Forced Draft Fired Boilers, Steam Generating Units, and Process Heaters:

1. Operate the combustion unit at the firing rate most typical of normal operation. If the combustion unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record the stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke-spot number¹ (for liquid fuels), and observe flame conditions after operation stabilizes at the firing rate selected. If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values², and if CO emissions are low and there is no smoke, the combustion unit is probably operating at near optimum efficiency at this particular firing rate. Complete the remaining steps in this procedure to determine whether still lower oxygen levels are practical.
3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2 and record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) or smoke-spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.
4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level, gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also observe the flame and record any changes in its condition.
5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
 - a. Unacceptable flame conditions, such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability;
 - b. Stack gas CO concentrations greater than 400 ppm;
 - c. Smoking at the stack; or

¹The smoke-spot number shall be determined with ASTM D2156.

²Typical minimum oxygen levels for boilers firing at high firing rates are 0.5 – 3% (gaseous fuels) and 2 – 4% (liquid fuels).

- d. Equipment related limitations, such as low windbox/furnace pressure differential, built in air-flow limits, etc.
- 6. Develop an O₂/CO curve (for gaseous fuels) or O₂/smoke curve (for liquid fuels) using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.
- 7. From the O₂/CO curve or the O₂/smoke curve, find and record the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

Fuel	Measurement	Value
Gaseous	CO Emissions	400 ppm
#1 & #2 oils	Smoke-spot number	Number 1
#4 oils	Smoke-spot number	Number 2
#5 oils	Smoke-spot number	Number 3
Other oils	Smoke-spot number	Number 4

- 8. The stack gas oxygen level recorded in Step 7 is the minimum excess oxygen level (or the CO/smoke threshold). Compare the minimum excess oxygen level to the expected value provided by the combustion unit manufacturer. If the minimum level is found to be substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mixing, thereby allowing operation with less air.
- 9. Increase the minimum excess oxygen level identified in Step 7 by 0.5 to 2.0 percent and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.
- 10. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1 through 8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, settings should optimize conditions at that firing rate.
- 11. Verify that the new settings can accommodate the sudden changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion controls to provide a slightly higher level of excess oxygen. Verify the new settings in a similar manner. The final control settings that reflect combustion optimization shall be recorded for future reference.

Natural Draft Fired Boilers, Steam Generating Units, and Process Heaters:

1. Verify that the combustion unit is operating at the lowest pressure or temperature setting that will satisfy load demand. This pressure or temperature will be used as a basis for comparative combustion analysis before and after tuning.
2. Verify that the combustion unit will operate for the minimum number of hours necessary to perform the tuning procedure.
3. Verify that the size of air supply openings is in compliance with applicable codes and regulations. Air supply openings must be fully open when the burner is firing and air flow must be unrestricted.
4. Verify that the vent is in good condition, properly sized, and free from obstruction.
5. Perform a combustion analysis at both high and low fire, if possible. Record the following data for each combustion analysis:
 - a. The concentration of CO and oxygen;
 - b. Inlet fuel pressure at burner at high and low firing rates;
 - c. Steam pressure, water temperature, process fluid temperature, or temperature entering and leaving the combustion unit; and
 - d. Inlet fuel use rate, if a meter is available.
6. Clean all dirty burners or burner orifices. Verify that fuel filters and moisture traps are in place, clean, and operating properly. Confirm proper location and orientation of burner diffuser spuds, gas canes, etc. Replace or repair damaged or missing burner parts.
7. Remove external and internal sediment and scale from heating surfaces.
8. Verify that the necessary water or process fluid treatment is being used. Confirm flushing and/or blowdown schedule.
9. Repair all leaks. In addition to the high-pressure lines, check the blow-off, drain, safety valve, bypass lines, and if used, the feed pump.
10. Perform the following safety checks:
 - a. Test primary and secondary low water level controls;
 - b. Check operating and limit pressure and temperature controls;
 - c. Check pilot safety shut off operation;
 - d. Check safety valve pressure setting and verify that the setting is consistent with load requirements; and
 - e. Check limit safety control and spill switch.
11. Adjust the combustion unit to fire at the maximum inlet fuel use rate; record fuel manifold pressure.

12. Adjust draft and/or fuel pressure to obtain acceptable, clean combustion at high, medium, and low firing rates. The CO concentration should not exceed 400 ppm at 3% oxygen.
13. Verify that light-offs are smooth and safe. Perform a reduced fuel pressure test at both high and low firing rates in accordance with the manufacturer's instructions.
14. Check and adjust the modulation controller. Verify proper, efficient, and clean combustion through the range of firing rates. When optimum performance has been achieved, record all data.
15. Perform a final combustion analysis on the warm combustion unit at high, medium, and low firing rates, if possible. Record data obtained from the combustion analysis as well as the following information:
 - a. Inlet fuel pressure at burner at high and low firing rates;
 - b. Pressure above draft hood or barometric damper at high, medium, and low firing rates.
 - c. Steam pressure, water temperature, or process fluid pressure or temperature entering and leaving the combustion unit; and
 - d. Inlet fuel use rate if a meter is available.