

COUNTY NOTICES PURSUANT TO A.R.S. § 49-112

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NOTICE OF PROPOSED RULEMAKING

Maricopa County Air Pollution Control Regulations

Rule 322 – Power Plant Operations

Rule 323 – Fuel Burning Equipment From Industrial/Commercial/Institutional Sources

Rule 324 – Stationary Internal Combustion Engines

[M05-472]

PREAMBLE

1.

<u>Rules Affected</u>	<u>Rulemaking Action</u>
Rule 322	Amend
Rule 323	Amend
Rule 324	Amend

2. **The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):**
Authorizing statutes: Arizona Revised Statutes (A.R.S.) § 49-112 (A) and § 49-479.
Implementing statutes: Arizona Revised Statutes (A.R.S.) § 49-479

3. **A list of all previous notices appearing in the Register addressing the proposed rule:**
Notice Of Rulemaking Docket Opening
Arizona Administrative Register (AAR), Volume # 11, Issue # 16 April 15, 2005

4. **The name and address of agency personnel with whom persons may communicate regarding the rulemaking:**
Name: Patricia P. Nelson or Jo Crumbaker, Air Quality Department
Address: 1001 North Central Avenue, Suite # 695, Phoenix, AZ 85004
Telephone: 602-506-6709 or 602-506-6705 Fax Number: 602-506-6179
E-Mail Address: pnelson@mail.maricopa.gov or jcrumbak@mail.maricopa.gov

5. **An explanation of the rules, including the agency's reasons for initiating the rules:** Since Maricopa County is proposing to amend Rule 100 (General Provisions and Definitions) by adding a definition for nitrogen oxides, the County will also propose to amend Rules 322, 323, and 324 by removing the definitions of nitrogen oxides (NOx) in all three of the combustion rules, thus eliminating duplication of the terms. The other significant amendment to the rules is the listing of EPA Reference Method 202 separately from EPA Reference Method 5. Performance of Method 202 will aid in quantifying condensable particulate emissions for emission inventory purposes. Condensable PM contributes to ambient PM levels and significantly to ambient PM_{2.5} levels. Even though the particulate standards in these rules apply to compliance testing using Method 5, testing results per Method 202 will be used by the County to categorize the source and for emission inventory purposes.

Some minor administrative changes are also being proposed in the three different rules such as correcting section references, correcting usage of the term "heat input" in Rules 322 and 323 and the removal of the "#" sign before the American Society of Test Methods (ASTM) standards listed in each rule. Another amendment to the rule package is the reference to exemptions in subsection 103.8 of Rule 323. The County will propose to amend the text to reflect the same language used in Rule 322, subsection 103.1 stating that the exemption applies to "Combustion equipment associated with nuclear power operations." Other changes to the rules are the proposed deletion of subsections that

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have to do with compliance in Section 400. Since many of the compliance dates have already passed, Maricopa County is proposing to remove these sections from the rule package.

Section-by-Section Explanation for the Amended or Proposed Rules
Rule 322

Section 104.1 – This proposed amendment will change a reference number from 401.4 to 401.2 based upon deletion of subsections 401.3 and 401.4 in Section 401.

Section 104.2 - This proposed amendment will change a reference number from 401.4 to 401.2 based upon deletion of subsections 401.3 and 401.4 in Section 401.

Section 104.3 - This proposed amendment will change a reference number from 401.4 to 401.2 based upon deletion of subsections 401.3 and 401.4 in Section 401.

Section 221 – This proposed amendment will remove the definition of nitrogen oxides from the rule since it will be defined in amended Rule 100 that is scheduled to be adopted in February.

Subsection 301.1 – This proposed amendment will remove the phrase “heat input” from this section because it is used incorrectly.

Subsection 301.2- This proposed amendment will add text that mandates particulate matter testing by performance of Method 202 for emission inventory purposes.

Subsection 301.3 – This proposed amendment will change the subsection number from 301.2 to 301.3 because new text was added in subsection 301.2.

Subsection 301.3a – This proposed amendment will change the subsection reference from 301.2a to 301.3a.

Subsection 301.4 – This proposed amendment will change the subsection reference from 301.3d to 301.4.

Section 303- This proposed amendment will remove the limitation on use of existing supplies of used fuel oil because the date for compliance with this section (January 3, 2005) has already passed.

Subsection 304.1 – This proposed amendment will remove the term “heat input” from the emission limit for nitrogen oxides if using gaseous fuel because it was used incorrectly.

Subsection 304.2 - This proposed amendment will remove the term “heat input” from the emission limit for nitrogen oxides if using liquid fuel because it was used incorrectly.

Subsection 304.3 – This proposed amendment will add text to describe the conditions for testing nitrogen oxides: 15 % oxygen for stationary gas turbines and 3 % oxygen for electric utility steam generating units and cogeneration units. These conditions are the same for testing carbon monoxide.

Subsection 401.1 - This proposed amendment will remove the text that lists the date of compliance for filing an Operations and Maintenance plan with the Control Officer because the date of March 2, 2004 has already passed. This proposed amendment will also renumber text from the third sentence of subsection 401.2 to subsection 401.1.

Subsection 401.2– This proposed amendment will remove the text that lists the date of compliance for modifying Emission Control Systems (ECS) with the Control Officer because the date of January 2, 2004 has already passed and will insert the date of January 2, 2006 by which ECS equipment to achieve compliance shall be in operation (instead

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of stating a time frame of 30 months after adoption of the rule). This proposed amendment will also renumber text from the third sentence of subsection 401.2 to subsection 401.1.

Subsection 401.3– This proposed amendment will remove text that lists the date of compliance for submitting a schedule for installing an ECS because the date of March 2, 2004 has already passed and will insert the date of January 2, 2006 by which ECS equipment to achieve compliance shall be in operation (instead of stating a time frame of 30 months after adoption of the rule).

Subsection 401.4 – The first proposed amendment will remove the text that lists the date of compliance for submitting a schedule for installing or modifying an ECS because the date of March 2, 2004 has already passed. The second proposed amendment will insert the actual date of July 2, 2006 by which the installation of the CEMS, if required, shall be installed instead of the time frame of 36 months after the rule is adopted. This subsection will now be renumbered subsection 401.2 due to deletion of text in the current rule, subsection 401.2.

Subsection 501.6 – These amendments will change the references from 301.2 to 301.3 and from 301.2 a or b to 301.3 a or b.

Section 504 – The first proposed amendment of this section will insert the more recent version of 2004 for the reference to the Code of Federal Regulations instead of the 2001 version of the Code. The second proposed amendment will list the new name of the Maricopa County Air Quality Department instead of the Environmental Services Department. The reference to the Environmental Services Department is no longer applicable because Air Quality is now its own department. The third amendment will change the subsections reference from 504.10 through 505.13 to 504.11 through 504.14.

Subsection 504.5 – This proposed amendment will remove EPA Reference Method 202 from this section.

Subsection 504.6 – This proposed amendment will list EPA Reference Method 202 separately from EPA Reference Method 5.

Subsection 504.11 – This proposed amendment will remove the symbol “#” from the ASTM Method.

Subsection 504.12 – This proposed amendment will remove the symbol “#” from the ASTM Method.

Subsection 504.13 - This proposed amendment will remove the symbol “#” from the ASTM Method.

Subsection 504.14 - This proposed amendment will remove the symbol “#” from the ASTM Method.

Rule 323

Subsection 103.8 – This proposed change will rephrase the exemption to “Combustion equipment associated with nuclear power plant operations” so that the phrase will match the wording in Rule 322 (Power Plant Operations).

Subsection 104.1 - This proposed change will exempt stationary gas turbines from new subsection 301.2.

Subsection 104.2 - This proposed change will exempt stationary gas turbines from new subsection 301.2.

Section 211- This proposed change will remove the definition of nitrogen oxides from the rule since it will be defined in amended Rule 100 that is scheduled to be adopted in February.

Section 223 - This proposed change will remove a parentheses that was placed in the text by mistake.

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Subsection 301.1 – This proposed change will remove the term “heat input” from the emission limit for nitrogen oxides if using non-gaseous liquid fuels or liquid fuels because it was used incorrectly.

Subsection 301.2 - This proposed change will add text that mandates particulate matter testing by performance of Method 202 for emission inventory purposes.

Subsection 301.3- This proposed change will change subsection 301.2 to 301.3 due to the addition of new text in subsection 301.2.

Section 301.3b – This proposed change will delete the reference “301.2 a” and replaces it with the correct reference now of 301.3a.

Subsection 303.2 – This proposed change will delete the text for using existing supplies of used fuel oil because the compliance date has already passed.

Subsection 304.1 (b) (1) – This proposed change will remove the term “heat input” from the emission limit for nitrogen oxides if using gaseous fuels because it was used incorrectly.

Subsection 304.1 (b) (2) - This proposed change will remove the term “heat input” from the emission limit for nitrogen oxides if using liquid fuel because it was used incorrectly.

Subsection 304.3 - This proposed change will add text to describe the conditions for testing nitrogen oxides: 15 % oxygen for stationary gas turbines and 3% oxygen for electric utility steam generating units and cogeneration units. These conditions are the same for testing carbon monoxide.

Subsection 401.1- This proposed change will delete the text that lists the date of compliance for filing an Operations and Maintenance Plan because the date of March 2, 2004 has already passed.

Subsection 401.2 –This proposed change will delete the text for compliance with modifications to an ECS because the dates, March 2, 2004 and July 2, 2005 have already passed.

Subsection 401.3 – This proposed change will delete the text concerning compliance with an ECS since the date of March 2, 2004 has already passed and will renumber the third sentence of this subsection to 401.

Section 504 - The reference to the Code of Federal Regulations (CFR) is outdated (2001) and the proposed change will be to update the reference to the newer edition of the CFR (2004). The reference to the Environmental Services Department is no longer applicable because Air Quality is now its own department. This proposed change will list the new name of the Maricopa County Air Quality Department instead of the Environmental Services Department. Another change entails the renumbering of the references herein to the American Society of Testing Materials, from subsection 504.10 to 504.11 and from subsection 504.13 to subsection 504.14.

Subsection 504.10 – This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 504.11 – This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 504.12 - This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 504.13 - This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 504.14 - This proposed change will remove the symbol “#” from the ASTM Method.

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Rule 324

Section 216 – This proposed change will remove the definition of nitrogen oxides from the rule since it will be defined in amended Rule 100 that is scheduled to be adopted in February.

Subsection 301.1 – This proposed change will remove text referring to the usage of stored fuel oil since the compliance dates of October 23, 2003 and April 22, 2005 have already passed.

Section 304 , Table 3 –This proposed change will add “asterisk- referenced” text to the area following Table 3 which refers to performance of Method 202 for emission inventory purposes.

Subsection 401.1 –This proposed change will delete text referring to a compliance date of April 22, 2004 because the date has already passed.

Subsection 401.2- This proposed change will delete the first sentence of the text referring to the compliance date by which engines need to be rebuilt or retrofitted because the compliance date of October 22, 2004 has already passed. This subsection will be renumbered as subsection 401.1 due to the deletion of the original subsection 401.1.

Subsection 401.3 – This proposed change will be the renumbering subsection 401.3 to 401.2.

Subsection 502.2 – This proposed amendment will change the incorrect reference of subsection 103 to the correct reference of subsection 301.

Section 503 – These proposed changes will replace the 2001 date of the Code of the Federal Register with a 2004 date and will change the references to test methods listed in subsection 503.11 to 503.12 and 503.14 to 503.15. Another proposed change will list the new name of the Maricopa County Air Quality Department instead of the Environmental Services Department. The reference to the Environmental Services Department is no longer applicable because Air Quality is now its own department.

Subsection 503.11 - This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 503.12 - This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 503.13 - This proposed change will remove the symbol “#” from the ASTM Method.

Subsection 503.14 - This proposed change will remove the symbol “#” from the ASTM Method.

6. The time during which the County will accept written comments and the time and the place where oral comments may be made:

Formal oral comments may be made at the oral proceeding on January 12, 2006. Formal written comments will be accepted from the time of publication of this document until the day after the oral proceeding, January 13, 2006 at 5 p.m. Formal comments will be addresses in the Notice of Final Rulemaking.

7. Demonstration of compliance with A.R.S. § 49-112:

Under A.R.S.§ 49-112 (A), Maricopa County may adopt rules that are more stringent than or in addition to a provision of the state, provided that the rule is necessary to address a peculiar local condition; and if it is either necessary to prevent a significant threat to public health or the environment that results from a peculiar local condition and is technically and economically feasible; or if it is required under a federal statute or regulation, or authorized pursuant to an intergovernmental agreement with the federal government to enforce federal statutes or regulations if the county rule is equivalent to federal statutes or regulations; and if any fee adopted under the rule will not exceed the reasonable costs of the county to issue and administer that permit program. Maricopa County is in

compliance with A.R.S. §49-112(A) in that Maricopa County proposes to adopt revisions to Rules 322,323, and 324 that are more stringent than a provision of the state in order to address a peculiar local condition, the designation of Maricopa County as a serious non-attainment area for ozone, carbon monoxide and particulate matter at 10 microns. Maricopa County is the only ozone nonattainment county in Arizona.

8. **A reference to any study relevant to the rule that the agency reviewed and either proposes to rely on in its evaluation or justification for the rule, or proposes not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of the study and other supporting material:**

None.

9. **A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:**

Not applicable

10. **The preliminary summary of the economic, small business and consumer impact:**

There will be no economic impact on Maricopa County since the changes to this rule are administrative in nature. There will be an estimated \$500 fee to industry every time the source performs the compliance testing because they will be performing EPA Reference Method # 202 in addition to EPA Reference Method # 5.

11. **The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rules or, if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rules:**

Oral Proceeding Date: January 12, 2006 at 9:00 A.M.

Location: Maricopa County Air Quality Department
5th Floor Conference Room #560
1001 North Central Avenue, Phoenix, Arizona 85004

Nature: Public hearing with the opportunity for formal comments on the record regarding the proposed rules and submittal of the rules to EPA as a revision to the State Implementation Plan (SIP). Written comments will be accepted from the date of the publication of this document until the day after the oral proceeding. All comments made at this oral proceeding will be considered formal comments and will be addressed in the Notice of Final Rulemaking.

Call 602-506-0169 for current information. Please call 602-506-6443 for special accommodations under the Americans with Disabilities Act.

12. **Any other matters prescribed by statute that are applicable to the specific agency or to any specific rules or class of rules:**

None

13. **Incorporations by reference and their location in the rules:**

New incorporations by reference Location

None

REGULATION III - CONTROL OF AIR CONTAMINANTS

**RULE 322
POWER PLANT OPERATIONS**

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Adopted 7/02/03

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS**

**REGULATION III - CONTROL OF AIR CONTAMINANTS
RULE 322**

POWER PLANT OPERATIONS

SECTION 100 - GENERAL

- 101 PURPOSE:** To limit the discharge of nitrogen oxides, sulfur oxides, particulate matter and carbon monoxide emissions into the atmosphere from stationary fossil-fuel-fired equipment at existing power plants and existing cogeneration plants and to limit particulate matter emissions from cooling towers associated with this equipment.
- 102 APPLICABILITY:** This rule applies to any of the following types of equipment that burn fossil fuel for which construction commenced prior to May 10, 1996:
 - 102.1** Each electric utility steam generating unit or cogeneration steam generating unit used to generate electric power that has a heat input of equal to or greater than 100 million (MM) Btu/hour (29 megawatts (MW)).
 - 102.2** Each electric utility stationary gas turbine with a heat input at peak load equal to or greater than 10 MMBtu/hour (2.9 MW) based upon the lower heating value of the fuel.
 - 102.3** Each cooling tower associated with the type of equipment listed in subsections 102.1 and 102.2.

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

103.1 Combustion equipment associated with nuclear power plant operations; or

103.2 Reciprocating internal combustion equipment.

104 PARTIAL EXEMPTIONS:

104.1 Stationary gas turbines that meet any of the following criteria listed below are exempt from Sections 304 and 305 and subsections 301.1, 306.4, ~~401.4~~ 401.2, and 501.4 of this rule:

a. Used for fire fighting; or

b. Used for flood control; or

c. Used in the military at military training facilities or military gas turbines for use in other than a garrison; or

d. Engaged by manufacturers in research and development of equipment for either gas turbine emission control techniques or gas turbine efficiency improvements.

104.2 All equipment listed in Section 102 fired with an emergency fuel that is normally fired with natural gas is exempt from Sections 304 and 305 and subsections 301.1, 306.4, ~~401.4~~ 401.2, and 501.4 of this rule.

104.3 All equipment listed in Section 102 shall be exempt from Sections 304 and 305 and subsections 301.1, 306.4, ~~401.4~~ 401.2, and 501.4 of this rule for 36 cumulative hrs. of firing emergency fuel per year, per unit for testing, reliability, training, and maintenance purposes.

SECTION 200 - DEFINITIONS: For the purpose of this rule, the following definitions shall apply: See Rule 100 (General Provisions and Definitions) of these rules for definitions of terms that are used but not specifically defined in this rule.

201 COGENERATION STEAM GENERATING UNIT – A steam or hot water generating unit that simultaneously produces both electrical (or mechanical) and thermal energy (such as heat or steam) from the same primary energy source and supplies more than one-third of its potential electric output to any utility power distribution system for sale.

202 COMBINED CYCLE GAS TURBINE – A type of stationary gas turbine wherein heat from the turbine exhaust is recovered by a steam generating unit to make steam for use in a steam-electric turbine.

203 CONTINUOUS EMISSION MONITORING SYSTEM (CEMS) – The total equipment required to sample and analyze emissions or process parameters such as opacity, nitrogen oxide, and oxygen or carbon dioxide, and to provide a permanent data record.

204 COOLING TOWERS – Open water recirculating devices that use fans or natural draft to draw or force air through the device to cool water by evaporation and direct contact.

205 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 changes, and progress reports.

- 206** **DISTILLATE OIL** – A petroleum fraction of fuel oil produced by distillation that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396-01, “Standard Specification for Fuel Oils.”
- 207** **DRIFT** – Water droplets, bubbles, and particulate matter that escape from cooling tower stacks.
- 208** **DRIFT ELIMINATOR** – Device used to remove drift from cooling tower exhaust air, thus reducing water loss by relying on rapid changes in velocity and direction of air-droplet mixtures by impaction on eliminator passage surfaces. A drift eliminator is not categorized as an emission control system but is an inherent part of the cooling tower's design requirements.
- 209** **DRIFT RATE** – Percentage (%) of circulating water flow rate that passes through a drift eliminator on a cooling tower.
- 210** **ELECTRIC UTILITY STATIONARY GAS TURBINE** – Any stationary gas turbine that is constructed for the purpose of supplying more than 1/3 of its potential electric output capacity to any utility power distribution system for sale. Both simple and combined cycle gas turbines are types of electric utility stationary gas turbines.
- 211** **ELECTRIC UTILITY STEAM GENERATING UNIT** – Any steam electric generating unit that uses fossil fuel and is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW electric output to any utility power distribution system for sale.
- 212** **EMERGENCY FUEL** - Fuel fired only during circumstances such as natural gas emergency, 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 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 by the power company.
- 213** **EMISSION CONTROL SYSTEM (ECS)**– A system approved in writing by the Control Officer, designed and operated in accordance with good engineering practice to reduce emissions.
- 214** **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.
- 215** **FUEL SWITCHING STARTUP PROCESS** – The act of changing from one type of fuel to a different type of fuel.
- 216** **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.
- 217** **HIGHER HEATING VALUE (HHV) or GROSS HEATING VALUE** – The amount of heat produced by the complete combustion of a unit quantity of fuel determined by a calorimeter wherein the combustion products are cooled to the temperature existing before combustion and all of the water vapor is condensed to liquid.
- 218** **LOW SULFUR OIL** – Fuel oil containing less than or equal to 0.05 % by weight of sulfur.

- 219 LOWER HEATING VALUE (LHV) OR NET HEATING VALUE** – The amount of heat produced by the complete combustion of a unit quantity of fuel determined by a calorimeter wherein the combustion products are cooled to the temperature existing before combustion and all of the water vapor remains as vapor and is not condensed to a liquid. The value is computed from the higher heating value by subtracting the water originally present as moisture and the water formed by combustion of the fuel.
- 220 NATURAL GAS CURTAILMENT** - An interruption in natural gas service, such that the daily fuel needs of a combustion unit cannot be met with natural gas available due to one of the following reasons, beyond the control of the owner or operator:
- 220.1** An unforeseeable failure or malfunction, not resulting from an intentional act or omission that the governing state, federal or local agency finds to be due to an act of gross negligence on the part of the owner or operator; or
- 220.2** A natural disaster; or
- 220.3** The natural gas is curtailed pursuant to governing state, federal or local agency rules or orders; or
- 220.4** The serving natural gas supplier provides notice to the owner or operator that, with forecasted natural gas supplies and demands, natural gas service is expected to be curtailed pursuant to governing state, federal or local agency rules or orders.
- ~~**221 NITROGEN OXIDES (NO_x)** – Oxides of nitrogen calculated as equivalent nitrogen dioxide.~~
- 222221 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.
- 223222 PARTICULATE MATTER EMISSIONS** – Any and all particulate matter emitted to the ambient air as measured by applicable state and federal test methods.
- 224223 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 standard day conditions).
- 225224 POWER PLANT OPERATION** – An operation whose purpose is to supply more than one-third of its potential electric output capacity to any utility power distribution system for sale.
- 226225 RATED HEAT INPUT CAPACITY** – The heat input capacity in million Btu/hr. a specified on the nameplate of the combustion unit. If the combustion unit has been altered or modified such that its maximum heat input is different than the heat input capacity on the name plate, the maximum heat input shall be considered the rated heat input capacity.
- 227226 REGENERATIVE CYCLE GAS TURBINE** – Any stationary gas turbine that recovers thermal energy from the exhaust gases and utilizes the thermal energy to preheat air prior to entering the combustion unit.
- 228227 RESIDUAL OIL** – The heavier oils that remain after the distillate oils and lighter hydrocarbons are distilled off in refinery operations. This includes crude oil or fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05 % by weight, and all fuel oil numbers 4, 5, and 6, as defined by the American Society of Testing and Materials in ASTM D396-01, “Standard Specifications for Fuel Oils.”

- ~~229~~**228** **SIMPLE CYCLE GAS TURBINE** – Any stationary gas turbine that does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or that does not recover heat from the gas turbine exhaust gases to heat water or generate steam.
- ~~230~~**229** **STATIONARY GAS TURBINE** – Any simple cycle gas turbine, regenerative gas turbine or any gas turbine portion of a combined cycle gas turbine that is not self propelled or that is attached to a foundation.
- ~~234~~**230** **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.
- ~~232~~**231** **THIRTY DAY (30) ROLLING AVERAGE** – An arithmetic mean or average of all hourly emission rates for 30 successive combustion equipment operating days and calculated by a CEMS every hour.
- ~~233~~**232** **THREE (3) HOUR ROLLING AVERAGE** – An arithmetic mean or average of the 180 most recent 1-minute average values calculated by a CEMS every minute.
- ~~234~~**233** **TOTAL DISSOLVED SOLIDS (TDS)** – The amount of concentrated matter reported in milligrams/liter (mg/l) or parts per million (ppm) left after filtration of a well-mixed sample through a standard glass fiber filter. The filtrate is evaporated to dryness in a weighed dish and dried to constant weight at 180° C and the increase in dish weight represents the total dissolved solids.
- ~~235~~**234** **UNCOMBINED WATER** – Condensed water containing no more than analytical amounts of other chemical elements or compounds.

SECTION 300 – STANDARDS

301 LIMITATIONS – PARTICULATE MATTER:

- 301.1 Fuel Type:** An owner or operator of any combustion equipment listed in Section 102 shall burn only natural gas except when firing emergency fuel per subsection 104.2 and 104.3 of this rule. An owner or operator may burn a fuel other than natural gas for non-emergency purposes providing that the fuel shall not cause to be discharged more than 0.007 lbs. of particulate matter per MMBtu ~~heat input~~, demonstrated and documented through performance testing of this alternate fuel. This usage of different fuels other than natural gas shall be approved by the Control Officer prior to usage.
- 301.2 Particulate Matter Testing** – A backhalf analysis shall be performed, using Reference Method 202 referenced in subsection 504.6, each time a compliance test for particulate matter emissions to meet the standard in subsection 301.1 of this rule is performed using Method 5. The results of the Method 202 testing shall be used for emissions inventory purposes.
- ~~301.2~~**301.3 Good Combustion Practices:** An owner or operator of any stationary gas turbine listed in subsection 102.2, regardless of fuel type, shall use operational practices recommended by the manufacturer and parametric monitoring to ensure good combustion control. In lieu of a manufacturers' recommended procedure to ensure good combustion practices, one of the following procedures may be used:
- 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. If a valid maximum 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; or

- b. If the manufacturer recommends that the maximum numerical temperature differential to ensure good combustion is a temperature that is greater than 100°F, then proof of this maximum alternate temperature shall be submitted to the Control Officer. The procedure to measure the maximum temperature differential listed above in subsection 301.2a shall then be followed using the alternate recommended maximum temperature differential after approval by the Control Officer.
- c. If the frequency of failure to meet the proper temperature differential of 100°F or to meet the alternate temperature differential recommended by the manufacturer reflects a pattern that the turbine is not being operated in a manner consistent with good combustion practices, then the Control Officer may require the owner or operator to submit a Corrective Action Plan (CAP).

~~301.3~~ **301.4 Cooling Towers:** An owner or operator of a cooling tower associated with applicable units listed in Section 102 shall:

- a. Equip the cooling tower with a drift eliminator. The drift eliminator shall not be manufactured out of wood ~~and~~.
- b. The concentration of Total Dissolved Solids (TDS) multiplied by the percentage of drift rate shall not exceed the maximum numerical limit of 20.
- c. Visually inspect the drift eliminator on a monthly basis only if the drift eliminator can be viewed safely and does not require an owner or operator to walk into the tower. If the drift eliminator cannot be safely inspected monthly then subsection ~~301.3d~~ 301.4 shall apply:
- d. Visually inspect the drift eliminator for integrity during a regularly scheduled outage when the cooling tower is not operating if it cannot be inspected on a monthly basis. This visual inspection shall be no less than once per year.

302 LIMITATIONS – OPACITY:

302.1 No person shall discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity, except as provided in subsection 302.2.

302.2 Opacity may exceed the applicable limits established in subsection 302.1 for up to one hour during the start up of switching fuels; however, opacity shall not exceed 40 % for any six (6) minute averaging period in this one hour period, provided the Control Officer finds that the owner or operator has, to the extent practicable, maintained and operated the source of emissions in a manner consistent with good air pollution control practices for minimizing emissions. The one hour period shall begin at the moment of startup of fuel switching.

302.3 Determination of whether good air pollution control practices are being used shall be based on information provided to the Control Officer upon request, which may include, but is not limited to, the following:

- a. Monitoring results.

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- b. Opacity observations.
- c. Review of operating and maintenance procedures.
- d. Inspection of the source.

- 303 LIMITATIONS - SULFUR IN FUEL:** An owner or operator of any applicable equipment listed in Section 102 that burns fuel oil alone or in combo with any other fuel as either emergency fuel or non-emergency fuel that meets the standards in subsection 301.1 shall use only low sulfur oil ~~with one exception. Existing supplies in storage of any fuel oil and/or of any used fuel oil with sulfur content greater than 0.05% by weight may be used by the owner or operator until (1.5 years after adoption of rule) January 3, 2005 for emergency fuel. This usage shall be reported within 24 hours to the Control Officer, verbally along with the dates of usage. A written report shall follow within 48 hrs. of usage which shall include identification of the nature of the emergency and actual and expected dates of usage.~~
- 304 LIMITATIONS – NITROGEN OXIDES:** No owner or operator of any applicable equipment listed in subsection 102.1 that commenced construction or a major modification after May 30, 1972 shall cause to be discharged into the atmosphere nitrogen oxides in excess of the following limits:
- 304.1** 155 ppmv ~~heat input~~, calculated as nitrogen dioxide when burning gaseous fossil fuel. During steady state operations, this test result using EPA Reference Method(s) 7, shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. If a Continuous Emission Monitoring System (CEMS) is used, the test result shall be based upon a 30-day rolling average.
 - 304.2** 230 ppmv ~~heat input~~ calculated as nitrogen dioxide when burning liquid fossil fuel. During steady state operations, this test result using EPA Reference Method(s) 7, shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. If a CEMS is used, the test result shall be based upon a 30-day rolling average.
 - 304.3** The nitrogen oxides concentration shall be measured dry and corrected to 3% oxygen for electric utility steam generating units and cogeneration steam generating units. The nitrogen oxides concentration shall be measured dry and corrected to 15% oxygen for stationary gas turbines.
- 305 LIMITATIONS - CARBON MONOXIDE:** No owner or operator of any equipment listed in Section 102 shall cause to be discharged into the atmosphere carbon monoxide (CO) measured in excess of 400 ppmv during steady state compliance source testing. This test result, using EPA Reference Method 10, shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. The CO concentration shall be measured dry and corrected to 3% oxygen for electric utility steam generating units and cogeneration steam generating units. The CO concentration shall be measured dry and corrected to 15% oxygen for stationary gas turbines.
- 306 REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT AND ECS MONITORING EQUIPMENT:**
- 306.1 Emission Control System Required:** For affected operations which may exceed any of the applicable standards set forth in Section 300 of this rule, an owner or operator may comply by installing and operating an emission control system (ECS).

306.2 Providing and Maintaining ECS Monitoring Devices: No owner or operator required to use an approved ECS pursuant to this rule shall do so without first properly installing, operating, and maintaining 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 as described in an approved O&M Plan.

306.3 Operation and Maintenance (O&M) Plan Required For ECS:

- a. **General Requirements:** An owner or operator shall provide and maintain an O&M Plan for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or to an air pollution permit.
- b. **Approval by Control Officer:** An owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule.
- c. **Initial Plans:** An owner or operator that is required to have an O&M Plan pursuant to this rule shall comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified by the Control Officer in writing. Once the initial plan has been approved in writing by the Control Officer, an owner or operator shall then comply with the approved plan.
- d. **Revisions to Plan:** If revisions to the initial plan have been approved by the Control Officer in writing, an owner or operator shall comply with the revisions to the initial plan.
- e. **Control Officer Modifications to Plan:** After discussion with the owner or operator, the Control Officer may modify the plan in writing prior to approval of the initial O & M plan. An owner or operator shall then comply with the plan that has been modified by the Control Officer.

306.4 Continuous Emission Monitoring Systems (CEMS):

- a. An owner or operator of a combustion unit subject to Section 304 with a heat input of greater than 250 MMBtu/hr, regardless of fuel type, shall install, calibrate, maintain, and operate a CEMS for measuring nitrogen oxides and recording the output of the system. Where nitrogen oxide emissions are monitored by a CEMS, then a CEMS shall also be required for the measurement of the oxygen content of the flue gases. All CEMS shall comply with the provisions in 40 CFR Subpart Da, Part 60, 60.47 (a).
- b. An owner or operator of any affected unit listed above that requires a CEMS for nitrogen oxides that meets and is continuing to meet the requirements of 40 CFR Part 75 may use that CEMS to meet the requirements of subsection 306.4a of this rule.

307 EMERGENCY FUEL USE NOTIFICATION – An owner or operator of a unit that uses emergency fuel that is normally fired with natural gas shall notify the Control Officer verbally no later than 24 hours after declaration of the emergency that necessitates its use per subsection 104.2. This verbal report shall be followed by a written report within 48 hrs. of initial usage which shall also include identification of the nature of the emergency, initial dates of usage, and the expected dates of usage.

SECTION 400 - ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE

- 401.1 ~~Operation and Maintenance (O&M) Plan:~~** Any owner or operator employing an approved ECS on the effective date of this rule shall by (insert 8 mos. after rule is adopted) file an O&M Plan with the Control Officer in accordance with subsection 306.3 of this rule.
- 401.2 ~~Modifications to Existing ECS:~~** Any owner or operator required to modify their ECS equipment or system by either reconstructing or adding on new equipment for compliance with this rule shall by (insert 6 months after rule is adopted) file a schedule for the modification with the Control Officer. The plan shall show how the ECS is to be used to achieve full compliance and shall specify dates for completing increments of progress. Any and all ECS(s) used to achieve such compliance shall be in operation by (insert 30 months after date of adoption of rule).
- 401.3 ~~ECS Installation:~~** An owner or operator required to install a new ECS to satisfy the requirements of this rule shall file a schedule for the installation of an ECS by (insert 8 months after the rule is adopted). The plan shall show how the ECS is to be used to achieve full compliance and shall specify dates for completing increments of progress. Any and all ECS(s) used to achieve such compliance shall be in operation by (insert 36 months after adoption of rule).
- 401.4 ~~CEMS Installation:~~** An owner or operator required to install or modify a CEMS to satisfy the requirements of this rule shall file a schedule for the installation or modification of the CEMS by (insert 8 months after the rule is adopted) and complete the installation of the CEMS by (insert 36 months after date of adoption of rule).
- 401.1 ECS Installation:** Any Emission Control System (ECS) used to achieve compliance with this rule shall be in full operation by July 2, 2006.
- 401.2 CEMS Installation:** Any Continuous Emission Monitoring System (CEMS) used to achieve compliance with this rule shall be in operation by July 2, 2006.

SECTION 500 - MONITORING AND RECORDS

- 501 RECORDKEEPING AND REPORTING:** Any owner or operator subject to this rule 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 Equipment Listed in Section 102:** Type of fuel used, amount of fuel used, amount of sulfur in the fuel if using liquid fuel, and the days and hours of operation.
- 501.2 Cooling Towers:** Monthly gravimetric testing reports for TDS shall be recorded for six months in succession and thereafter quarterly reports shall be recorded. Results of the monthly or yearly visual inspection of the drift eliminator shall also be recorded. If the drift eliminator cannot be visually inspected monthly, then documentation of the physical configuration of the drift eliminator shall be submitted to the Control Officer to demonstrate that the drift eliminator cannot be inspected monthly.

- 501.3 Emergency Fuel Usage:** Type and amount of emergency fuel used, dates and hours of operation using emergency fuel, nature of the emergency or reason for the use of emergency fuel as stated in subsections 104.2 and 104.3.
- 501.4 Fuel Switching:** Duration of fuel switch including stop and start times and monthly totals for twelve-month log of hours of operation for testing, reliability, and maintenance purposes per subsection 302.2.
- 501.5 CEMS:** All CEMS measurements, results of CEMS performance evaluations, CEMS calibration checks, and adjustments and maintenance performed on these systems.
- 501.6 Good Combustion Practices:** Measurements of the temperature differential across the burners of turbines per subsection ~~301.2~~ 301.3, results of evaluation and of corrective action taken to reduce the temperature differential or a finding that the temperature differential returned to the range listed in subsection ~~301.2~~ 301.3 a or b without any action by the owner or operator.
- 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 DETERMINATION:**
- 503.1 Low Sulfur Oil Verification:**
- a. An owner or operator shall submit fuel oil or liquid fuel receipts from the fuel supplier indicating the sulfur content of the fuel or verification that the oil used to generate electric power meets the 0.05% sulfur limit if requested by the Control Officer; or
 - b. If fuel receipts are not available then an owner or operator shall submit a statement of certification or proof of the sulfur content of the oil or liquid fuel from the supplier to the Control Officer; or
 - c. An owner or operator may elect to test the fuel for sulfur content in lieu of certification from the fuel supplier or fuel receipts.
- 503.2 Drift Rate Verification:** An owner or operator shall submit design drift rate verification from the manufacturer of the drift eliminator used in the cooling towers to the Control Officer if proof of the design drift rate is requested by the Control Officer.
- 504 TEST METHODS ADOPTED BY REFERENCE:** The EPA test methods as they exist in the Code of Federal Regulations (CFR) (July 1, ~~2001~~ 2004), as listed below, are adopted by reference. These adoptions by reference include no future editions or amendments. Copies of test methods referenced in this Section are available at the Maricopa County ~~Environmental Services~~ Air Quality Department, 1001 N. Central Avenue, Phoenix, AZ 85004-1942. The ASTM methods (1990, 1998 and 2000) and the Standard Methods listed below (1995) are also adopted by reference. When more than one test method as listed in subsections ~~504.10~~ 504.11 through ~~504.13~~ 504.14 is permitted for the same determination, an exceedance of the limits established in this rule determined by any of the applicable test methods constitutes a violation.

- 504.1** EPA Reference Methods 1 (“Sample and Velocity Traverses for Stationary Sources”), and 1A (“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 of 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). ~~and possibly, if requested by the Control Officer, EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).~~
- 504.6** EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).
- ~~504.6~~**504.7** EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7A (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7B (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Ultraviolet Spectrometry”), 7C (“Determination of Nitrogen Oxide Emissions from Stationary Sources - Alkaline-Permanganate Colorimetric Method”), 7D (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline-Permanganate Chromatographic Method”), and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Instrumental Analyzer Method”) (40 CFR 60, Appendix A).
- ~~504.7~~**504.8** EPA Reference Method 9 (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- 504.8** ~~504.9~~ EPA Reference Method 10 (“Determination of Carbon Monoxide Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- ~~504.9~~**504.10** EPA Reference Method 20 (“Determination of Nitrogen Oxides, Sulfur Dioxide and Diluent Emissions from Stationary Gas Turbines”) (40 CFR 60, Appendix A).
- ~~504.10~~**504.11** American Society of Testing Materials, ASTM Method #D2622-98, (“Standard Test Method for Sulfur in Petroleum Products by Wavelength Disperse X-Ray Fluorescence Spectrometry”), 1998.

~~504.11~~**504.12** American Society of Testing Materials, ASTM Method #D1266-98, (“Standard Test Method for Sulfur in Petroleum Products - Lamp Method”), 1998.

~~504.12~~**504.13** American Society of Testing Materials, AST Method #D2880-00, (“Standard Specification for Gas Turbine Fuel Oils”), 2000.

~~504.13~~**504.14** American Society of Testing Materials, ASTM Method #D4294-90 or 98 (“Standard Test Method for Sulfur in Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectrometry”), 1990 or 1998.

~~504.14~~**504.15** Standard Methods for the Examination of Water and Wastewater, (“Dissolved Solids Dried at 180°C, Method #2540C”), American Public Health Association, 19th edition, 1995.

REGULATION III - CONTROL OF AIR CONTAMINANTS

RULE 323

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

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Adopted 07/03/05

**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 equipment at industrial and/or commercial and/or institutional (ICI) sources.
- 102 APPLICABILITY:** This rule applies to any of the following types of ICI combustion equipment that burns either fossil fuels or alternative fuels:
- 102.1** Each steam generating unit that has a maximum design rated heat input capacity from fuels combusted in the generating unit of greater than 10 million (MM) Btu/hr (2.9 Megawatts (MW)).
 - 102.2** Each stationary gas turbine with a heat input at peak load equal to or greater than 2.9 megawatts (MW).
 - 102.3** Each cogeneration steam generating unit with a heat input of greater than 10 MMBtu/hr and
 - 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 and Regulations.
- 103 EXEMPTIONS:** This rule shall not apply to the following types of equipment:
- 103.1** Incinerators, crematories, or burn-off ovens; or
 - 103.2** Combustion equipment used in agricultural operations in the growing of crops or the raising of fowl or animals; or
 - 103.3** Dryers, cement and lime kilns; or
 - 103.4** Direct-fired process heaters; or
 - 103.5** Medical waste incinerators; or
 - 103.6** Reciprocating internal combustion equipment; or

103.7 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

103.8 Combustion equipment ~~used for the generation of nuclear power~~ associated with nuclear power operations; or

103.9 Water heaters used for the sole purpose of heating hot water for comfort or for radiant heat.

104 PARTIAL EXEMPTIONS:

104.1 Stationary gas turbines listed in subsection 102.2 that are used for any of the following reasons shall be exempt from Sections 304, 305 and subsections 301.1, 501.1 and 501.3 of this rule:

- a. Used for firefighting; or
- b. Used for flood control; or
- c. Used at military training facilities other than a garrison facility; or
- d. Engaged by manufacturers in research and the development of equipment for either gas turbine emission control techniques or gas turbine efficiency improvements; or
- e. Fired with emergency fuel that is normally fired with natural gas, or
- f. Testing, reliability, maintenance, training, and readiness purposes for a total of 36 hours per year per unit when firing any emergency fuel.

104.2 All steam generating units including cogeneration units and process heaters that are used for any of the following reasons shall be exempt from Sections 301, 304, 305 and subsections 501.1 and 501.3 of this rule:

- a. Fired with an emergency fuel that is normally fired with natural gas or
- b. Firing any emergency fuel for testing, reliability, and maintenance purposes up to a maximum total of 36 hrs. per unit per year.

SECTION 200 - DEFINITIONS: For the purpose of this rule, the following definitions shall apply See Rule 100 (General Provisions and Definitions) of these rules for definitions of terms that are used but not specifically defined in this rule:

201 ALTERNATIVE FUELS – Substitutes for traditional oil-derived and fossil-fuel derived motor vehicle fuels including but not limited to biodiesel, propane, ethanol or methanol.

202 COGENERATION STEAM GENERATING UNIT – A steam or hot water generating unit that simultaneously produces both electrical (or mechanical) and thermal energy (such as heat or steam) from the same primary energy source.

203 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 changes, and progress reports.

- 204** **DISTILLATE OIL**-A petroleum fraction of fuel oil produced by distillation that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396-01, "Standard Specification for Fuel Oils."
- 205** **EMERGENCY FUEL** – Fuel fired by a gas combustion unit, normally fueled by natural gas, only during circumstances of unforeseen disruption or interruption in the supply of natural gas to a unit that normally runs on natural gas. The inability to burn natural gas may be one of the following but is not limited to natural gas emergency, natural gas curtailment, or a breakdown of the delivery system.
- 206** **EMISSION CONTROL SYSTEM (ECS)** - A system approved in writing by the Control Officer, designed and operated in accordance with good engineering practice to reduce emissions.
- 207** **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.
- 208** **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.
- 209** **LOW SULFUR OIL** – Fuel oil containing less than or equal to 0.05 % by weight of sulfur.
- 210** **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.
- ~~**211** **NITROGEN OXIDES (NO_x)**— Oxides of nitrogen calculated as equivalent nitrogen dioxide.~~
- ~~**212**~~**211** **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.
- ~~**213**~~**212** **PARTICULATE MATTER EMISSIONS** - Any and all particulate matter emitted to the ambient air as measured by applicable state and federal test methods.
- ~~**214**~~**213** **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 standard day conditions).
- ~~**215**~~**214** **PROCESS HEATERS** – 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). Process heaters 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.
- ~~**216**~~**215** **RATED HEAT INPUT CAPACITY** - The heat input capacity in million Btu/hr. 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.

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- ~~217~~**216** **REGENERATIVE CYCLE GAS TURBINE** – Any stationary gas turbine that recovers thermal energy from the exhaust gases and utilizes the thermal energy to preheat air prior to entering the combustor.
- ~~218~~**217** **RESIDUAL OIL** – The heavier oils that remain after the distillate oils and lighter hydrocarbons are distilled off in refinery operations. This includes crude oil or fuel oil numbers 1 and 2 that have a nitrogen content greater than 0.05% by weight, and all fuel oil numbers 4, 5 and 6, as defined by the American Society of Testing and Materials in ASTM D396-01, “Standard Specifications for Fuel Oils”.
- ~~219~~**218** **SIMPLE CYCLE GAS TURBINE** – Any stationary gas turbine that does not recover heat from the gas turbine exhaust gases to preheat the inlet combustion air to the gas turbine, or that does not recover heat from the gas turbine exhaust gases to heat water or generate steam.
- ~~220~~**219** **STATIONARY GAS TURBINE** – Any simple cycle gas turbine or regenerative gas turbine that is not self-propelled or that is attached to a foundation.
- ~~221~~**220** **STEAM GENERATING UNIT** - An external combustion unit or boiler fired by fossil fuel that is used to generate hot water or steam. The hot water or steam is then used as energy for driving another process or piece of equipment.
- ~~222~~**221** **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.
- ~~223~~**222** **UNCOMBINED WATER** – Condensed water containing no more than analytical trace amounts of other chemical elements or compounds.
- ~~224~~**223** **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 as opposed to boilers, do not reach temperatures of 220°F and higher that boilers can reach and are not manufactured to meet boiler codes.

SECTION 300 - STANDARDS

301 LIMITATIONS - PARTICULATE MATTER:

301.1 Limitation: Liquid Fuels An owner or operator 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 lbs. per MMBtu ~~heat input~~ from any combustion units listed in subsection 102.1, 102.3 and 102.4 with either a rated heat input capacity or heat input of greater than 100 MM Btu/hr.

301.2 Particulate Matter Testing – ~~A backhalf analysis shall be performed, using Reference Method 202 referenced in subsection 504.6, each time a compliance test for particulate matter emissions to meet the standards in subsection 301.1 of this rule is performed using Method 5. The results of the Method 202 testing shall be used for emissions inventory purposes.~~

~~301.1~~**301.3 Good Combustion Practices:** An owner or operator of a stationary gas turbine listed in subsection 102.2, regardless of fuel type or size, shall use operational practices recommended by

the manufacturer and parametric monitoring that ensure good combustion control. In lieu of a manufacturer's recommended procedure to ensure good combustion practices, one of the following procedures may be used:

- a. 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. If a valid maximum temperature differential of greater than 100° F is observed across the burners, investigation and corrective action shall be taken within three hours to either reduce the temperature difference to 100° F or less, or
- b. If the manufacturer recommends that the maximum numerical temperature differential to ensure good combustion is a temperature that is greater than 100°F, then proof of this maximum alternate temperature shall be submitted to the Control Officer. The procedure to measure the maximum temperature differential listed above in subsection ~~301.2a~~ 301.3a shall then be followed using the alternate recommended maximum temperature differential after approval by the Control Officer.
- c. If a repetitive pattern of failure to meet the proper temperature differential of 100 °F or to meet the alternate temperature differential recommended by the manufacturer indicates that the turbine is not being operated in a manner consistent with good combustion practices, then the Control Officer may require the owner or operator to submit a Corrective Action Plan (CAP).

302 LIMITATIONS – OPACITY: No owner or operator shall 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: ~~303.1~~ An owner or operator of any applicable equipment listed in Section 102 that burns liquid fuel oil or a mixture or blend of fuel oil with any other fuels shall use only low sulfur oil ~~with one exception:~~

~~303.2~~ Existing supplies in storage of the fuel with a sulfur content greater than 0.05% by weight may be used by the owner or operator until (insert 1.5 years after adoption of rule) January 2, 2005. This usage shall be reported to the Control Officer along with the dates of usage within 72 hrs. of usage in writing. In the case of continuous or recurring high sulfur fuel use, the notification requirements of this rule shall be satisfied if the source provides the required notification and includes in the notification an estimate of the time for which the high sulfur fuel will be used. High sulfur fuel use that occurs after the estimated time period as originally reported shall require additional notification pursuant to this subsection.

304 LIMITATIONS – NITROGEN OXIDES:

304.1 An owner or operator of any combustion equipment listed in Section 102 with a heat input of greater than 10 MMBtu/hr. to 100 MMBtu/hr, except gas turbines, shall comply either with a or b below:

- a. Establish initial optimal baseline concentrations for NOx and CO utilizing the initial design burner specifications or manufacturer's recommendations to ensure good combustion practices. Tune the unit annually in accordance with good combustion practices or a manufacturer's procedure, if applicable, that will include the following at a minimum:

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. Measure the NO_x and the CO concentration of the effluent stream after each adjustment was made with a handheld portable monitor to ensure optimal baseline concentrations are maintained or

b. Limit nitrogen oxide emissions to no more than the following amounts:

1. 155 ppm ~~heat input~~, calculated as nitrogen dioxide, when burning gaseous fuel. During steady state operations, this test result using EPA Reference Method(s) 7 shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample run time of one hour.
2. 230 ppm ~~heat input~~, calculated as nitrogen dioxide, when burning liquid fuel. During steady state operations, this test result using EPA Reference Method(s) 7 shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample run time of one hour.

c. For simple gas turbines, the nitrogen oxides shall be measured dry and corrected to 15% oxygen. For all other combustion equipment, the nitrogen oxides shall be measured dry and corrected to 3% oxygen.

304.2 An owner or operator of any combustion equipment, listed in Section 102, with a heat input greater than 100 MMBtu/hr, shall:

- a. Tune the equipment every 6 months with good combustion practices or a manufacturer's procedure that at a minimum includes the procedures listed in subsection 304.1a. and
- b. Meet the NO_x emission limits as stated in subsection 304.1b.

305 **LIMITATIONS – CARBON MONOXIDE:** No owner or operator of any equipment listed in Section 102 with a heat input greater than 100 MM Btu/hr shall cause to be discharged into the atmosphere, carbon monoxide (CO), measured in excess of 400 ppmv, during steady state source testing. This test result, using EPA Reference Method 10, shall be based upon the arithmetic mean of the results of three test runs. Each test run shall have a minimum sample time of one hour. For simple gas turbines, the CO shall be measured dry and corrected to 15% oxygen. For all other combustion equipment, the CO shall be measured dry and corrected to 3% oxygen.

306 **REQUIREMENTS FOR AIR POLLUTION CONTROL EQUIPMENT AND ECS MONITORING EQUIPMENT:**

- 306.1 Emission Control System Required:** For affected operations which may exceed any of the applicable standards set forth in Sections 300 of this rule, an owner or operator may comply by installing and operating an emission control system (ECS).
- 306.2 Providing and Maintaining ECS Monitoring Devices:** No owner or operator required to use an approved ECS pursuant to this rule shall do so without first providing properly installing, operating and maintaining 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 as described in an approved O&M Plan.
- 306.3 Operation and Maintenance (O&M) Plan Required For ECS:**
- a. General Requirements:** An owner or operator shall provide and maintain an O&M Plan for any ECS, any other emission processing equipment, and any ECS monitoring devices that are used pursuant to this rule or to an air pollution permit.
 - b. Approval by Control Officer:** An owner or operator shall submit to the Control Officer for approval the O&M Plans of each ECS and each ECS monitoring device that is used pursuant to this rule.
 - c. Initial Plans:** An owner or operator that is required to have an O&M Plan pursuant to this rule shall comply with all O&M Plans that the owner or operator has submitted for approval, but which have not yet been approved, unless notified by the Control Officer in writing. Once the initial plan has been approved in writing by the Control Officer, an owner or operator shall comply with this approved plan.
 - d. Revisions to Plan:** If revisions to the initial plan have been approved by the Control Officer in writing, an owner or operator shall comply with the revisions to the initial plan.
 - e. Control Officer Modifications to Plan:** After discussion with the owner or operator, the Control Officer may modify the plan in writing prior to approval of the initial O&M plan. An owner or operator shall then comply with the plan that has been modified by the Control Officer.

SECTION 400 - ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE

- ~~**401.1 Operation and Maintenance (O&M) Plan:** Any owner or operator employing an approved ECS on the effective date of this rule shall by (insert 8 mos. after rule is adopted) March 2, 2004 file an O&M Plan with the Control Officer in accordance with subsection 306.3 of this rule.~~
- ~~**401.2 Modifications to Existing ECS:** Any owner or operator required to modify their ECS equipment or system by either reconstructing or adding on new equipment for compliance with this rule shall by (insert 8 months after rule is adopted) March 2, 2004 file a schedule for the modification with the Control Officer. The plan shall show how the ECS is to be used to achieve full compliance and shall specify dates for completing increments of progress. Any and all ECS used to achieve such compliance shall be in operation by (insert 24 months date of adoption of rule) July 2, 2005.~~

- ~~401.3~~ **ECS Installation:** An owner or operator required to install a new ECS for compliance with this rule shall by (insert 8 months after rule is adopted) ~~March 2, 2004~~ file a schedule for the installation with the Control Officer. The ECS shall be installed and in compliance by ~~(36 months after adoption of the rule)~~ July 2, 2006.

SECTION 500 - MONITORING AND RECORDS

- 501 RECORDKEEPING AND REPORTING:** An owner or operator subject to this rule 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 Equipment Listed In Section 102: Type of fuel used, amount of fuel used, amount of sulfur in the fuel if using liquid fuel, and the days and hours of operation.

501.2 Emergency Fuel Usage – Type of emergency fuel used, dates and hours of operation using emergency fuel, nature of the emergency or purpose for the use of emergency fuel as stated in subsections 104.1 and 104.2, and monthly totals for twelve-month log of hours of operation in the emergency mode.

501.3 Good Combustion Practice - Measurements of the temperature differential across the burners of turbines per subsection 301.2, 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 subsection 301.2 a or b without any action by the owner or operator.

501.4 Tuning Procedure – Date that the procedure was performed on the particular 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 handheld monitor after each adjustment.

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.

~~502~~ **503 COMPLIANCE DETERMINATION:**

503.1 Low Sulfur Oil Verification:

- a. An owner or operator shall submit fuel oil receipts from the fuel supplier indicating the sulfur content of the fuel oil or verification that the fuel oil used meets the 0.05% sulfur limit if requested by the Control Officer, or
- b. If fuel receipts are not available, an owner or operator shall submit a statement of certification or proof of the sulfur content of the fuel oil from the supplier to the Control Officer, or
- c. An owner or operator may elect to test the fuel oil for sulfur content in lieu of certification from the fuel supplier or fuel receipts.

504 TEST METHODS ADOPTED BY REFERENCE: The EPA test methods as they exist in the Code of Federal Regulations (CFR) (July 1, ~~2001-2004~~), as listed below, are adopted by reference. These adoptions

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by reference include no future editions or amendments. Copies of test methods referenced in this Section are available at the Maricopa County ~~Environmental Services~~ Air Quality Department, 1001 N. Central Avenue, Phoenix, AZ 85004-1942. The ASTM methods (1990, 1992, 1998 and 2000) are also adopted by reference. When more than one test method as listed in subsection ~~504.10-504.11~~ to ~~504.13-504.14~~ is permitted for the same determination, an exceedance of the limits established in this rule determined by any one of the applicable test methods constitutes a violation

- 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 of 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) and possibly, if requested by the Control Officer, ~~EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).~~
- 504.6** EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).
- ~~**504.6**~~ ~~**504.7**~~ EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7A (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7B (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Ultraviolet Spectrometry”), 7C (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline-Permanganate Colorimetric Method”), 7D (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline – Permanganate Chromatographic Method”), and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Instrumental Analyzer Method”), (40 CFR 60, Appendix A).
- ~~**504.7**~~ ~~**504.8**~~ EPA Reference Method 9 (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
~~Stationary Sources”) (40 CFR 60, Appendix A).~~
- ~~**504.8**~~ ~~**504.9**~~ EPA Reference Method 10, (“Determination of Carbon Monoxide from Stationary Sources”) (40 CFR 60, Appendix A).

~~504.9~~504.10EPA Reference Method 20 (“Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions From Stationary Gas Turbines”) (40 CFR 60, Appendix A).

~~504.10~~504.11American Society of Testing Materials, ASTM Method #D2622-92 or 98, (“Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry”), 1992 or 1998.

~~504.11~~504.12American Society of Testing Materials, ASTM Method #D1266-98, (“Standard Test Method for Sulfur in Petroleum Products (Lamp Method)”), 1998.

~~504.12~~504.13American Society of Testing Materials, ASTM Method #D2880-00, (“Standard Specification for Gas Turbine Fuel Oils”), 2000.

~~504.13~~504.14American Society of Testing Materials, ASTM Method #D4294-90 or 98, (“Standard Test Method for Sulfur in Petroleum and Petroleum Products by Energy- Dispersive X-ray Fluorescence Spectrometry”), 1990 or 1998.

REGULATION III - CONTROL OF AIR CONTAMINANTS

RULE 324

STATIONARY INTERNAL COMBUSTION (IC) ENGINES

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Adopted 10/23/03

**MARICOPA COUNTY
AIR POLLUTION CONTROL REGULATIONS
REGULATION III - CONTROL OF AIR CONTAMINANTS
RULE 324
STATIONARY INTERNAL COMBUSTION (IC) ENGINES**

SECTION 100 – GENERAL

- 101 PURPOSE:** To limit carbon monoxide (CO), nitrogen oxides (NO_x), sulfur oxides (SO_x), volatile organic compounds (VOCs), and particulate matter (PM) emissions from stationary internal combustion (IC) engines, including stationary IC engines used in cogeneration.
- 102 APPLICABILITY:** The provisions of this rule apply to any single existing or new stationary spark or compression-ignited reciprocating IC engine or IC engine used in cogeneration with a rating of greater than 250 brake horsepower (bhp). The provisions of this rule also apply to a combination of IC engines each with a rated brake horsepower greater than 50 bhp used at a single source, whose maximum aggregate rated brake horsepower is greater than 250 bhp.
- 103 EXEMPTIONS:** The following types of stationary IC engines are exempt from all of the requirements of this rule but shall comply with Rule 300:
 - 103.1** Any rotary engine, including gas turbines, jet engines,
 - 103.2** An IC engine operated as a non-road engine,

- 103.3** An IC engine used directly and exclusively by the owner and/or operator for agricultural operations necessary for the growing of crops or the raising of fowl or animals,
- 103.4** A laboratory IC engine used directly and exclusively for engine research including engine development, and subsequent engine performance verification for the purpose of either engine emission control techniques or engine efficiency improvements,
- 103.5** A prime engine when it is operated for purposes of performance verification and testing by the owner or operator or by a manufacturer or distributor of such equipment for the purpose of performance verification and testing at the production facility,
- 103.6** A compressed gas IC engine used for solar testing and research programs,
- 103.7** An IC engine operated as an emergency generator or other equipment at a nuclear power plant that must run for safety reasons and/or operational tests to meet requirements imposed by the Nuclear Regulatory Commission,
- 103.8** An IC engine test stand used for evaluating engine performance, and
- 103.9** An IC engine used for training purposes as long as the total number of hours of the operation does not exceed 100 hours per calendar year per engine.
- 104 PARTIAL EXEMPTIONS FOR EMERGENCY ENGINES:** Any stationary IC engine operated as an emergency engine for any of the following reasons is exempt from all of the provisions of this rule, except for the provisions in Sections 301, 303, and subsections 502.1 and 502.4:
- 104.1** Used only for power when normal power service fails from the serving utility or if onsite electrical transmission or onsite power generation equipment fails;
- 104.2** Used only for the emergency pumping of water resulting from a flood, fire, lightning strikes, police action or for any other essential public services which affect the public health and safety;
- 104.3** Used for lighting airport runways;
- 104.4** Used for sewage overflow mitigation and/or prevention;
- 104.5** Used for reliability-related activities such as engine readiness, calibration, or maintenance or to prevent the occurrence of an unsafe condition during electrical system maintenance, as long as the total number of hours of the operation does not exceed 100 hours per calendar year per engine;
- 104.6** Used as the prime engine when the prime engine has failed, but only for such time as is needed to repair the prime engine; or
- 104.7** Used to operate standby emergency water pumps for fire control that activate when sensors detect low water pressure.
- 105 PARTIAL EXEMPTIONS FOR NON-EMERGENCY LOW USAGE PRIME ENGINES:** The following non-emergency, low usage, prime engines are exempt from all of the provisions of this rule except for the provisions in Sections 301, 303 and subsections 502.1 and 502.4:

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- 105.1 Each engine rated at or below 1000 bhp that operates less than 200 hours in any 12-consecutive-month period, and
- 105.2 Each engine rated above 1000 bhp that operates less than 100 hours in any 12-consecutive month period.

SECTION 200 – DEFINITIONS: For the purpose of this rule, the following definitions shall apply. See Rule 100 (General Provisions And Definitions) of these rules for definitions of terms that are used but not specifically defined in this rule.

- 201 **AFTERCOOLER / INTERCOOLER**– A system that cools the engine intake air or air/fuel mixture after the air exits the turbocharger and prior to the introduction into the cylinder, thereby lowering NOx emissions.
- 202 **COGENERATION UNIT**– Internal combustion engine unit that burns fuel to simultaneously produce electricity and heat in a single thermodynamic process and is usually located in close proximity to the equipment requiring the heat energy.
- 203 **COMPRESSION - IGNITION ENGINE** – A reciprocating internal combustion engine with operating characteristics wherein the principal mechanism of igniting the fuel and air mixture in the cylinders is the compression of air in the cylinder until it is so hot that any fuel injected into the air or mixed with the air ignites. In this type of engine, a separate ignition source, such as a spark plug, is not used.
- 204 **DIESEL ENGINE** – A type of compression- ignited IC engine.
- 205 **EMERGENCY ENGINE**– Any stationary standby IC engine whose sole function is to provide back-up power when electric power from the local utility is interrupted or when operated solely for any of the reasons listed in Section 104. An emergency engine, for the purposes of this rule, shall not be used to supply standby power due to a voluntary reduction in power by a utility or power company, supply power for distribution or sale to the grid, or supply power at a source in order to avoid peak demand charges or high electric energy prices during on-peak price periods.
- 206 **ENGINE FAMILY** - A group of engines with similar design features such as fuel type, cooling medium, method of air aspiration, combustion chamber design including cylinder bore and stroke, exhaust aftertreatment (if any), method of fuel admission, and method of control. These engines are also expected to have similar emission and operating characteristics throughout their useful lives.
- 207 **EQUIVALENT REPLACEMENT ENGINE** - An engine that is substituted for a stationary IC engine that is intended to perform the same or similar function as the original engine and where all of the following conditions exist:
 - 207.1 The replacement engine results in equal or lower air contaminant emissions than the existing engine;
 - 207.2 The replacement engine meets the emission control technology standards contained in either Table 1 or Table 2 of this rule, and
 - 207.3 The rated bhp of the replacement engine does not exceed the rated bhp of the existing engine (or sum of existing engines) by more than 20 percent.
- 208 **EXISTING ENGINE** - An engine that commenced operation prior to October 22, 2003 or an engine on which the construction or modification has commenced prior to October 22, 2003, including the contractual obligation to undertake and complete an order for an engine.

209 IDENTICAL REPLACEMENT ENGINE -An engine that is substituted for an existing stationary IC engine that has the same manufacturer type, model number, manufacturer's maximum rated capacity, bhp, and that is intended to perform the same or similar function as the original stationary IC engine that it replaces and has equal or lower emissions or meets the emission control technology requirements in Section 304, Table 1, 2, or 3.

210 INTERNAL COMBUSTION (IC) ENGINE, NONROAD

210.1 Any IC engine:

a. In or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers);

b. In or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers); or

c. That, by itself or in or on a piece of equipment, is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include but are not limited to, wheels, skids, carrying handles, dollies, trailers, or platforms.

210.2 An internal combustion engine is not a nonroad engine if:

a. The engine is used to propel a motor vehicle or a vehicle used solely for competition, or is subject to standards promulgated under Section 202 of the Clean Air Act;

b. The engine is regulated by a federal New Source Performance Standard promulgated under Section 111 of the Clean Air Act;

c. The engine otherwise included in paragraph (c) above of this definition remains or will remain at a location for more than 12 consecutive months or a shorter period of time for an engine located at a seasonal source. A location is any single site at a building, structure, facility, or installation. Any engine (or engines) that replaces an engine at a location and that is intended to perform the same or similar function as the engine replaced will be included in calculating the consecutive time period. An engine located at a seasonal source is an engine that remains at a seasonal source during the full annual operating period of the seasonal source. A seasonal source is a stationary source that remains in a single location on a permanent basis (i.e. at least two years) and that operates at that single location approximately three months (or more) each year. This paragraph does not apply to an engine after the engine is removed from the location.

211 INTERNAL COMBUSTION (IC) ENGINE, STATIONARY - Any reciprocating, piston-driven IC engine that is operated or intended to be operated at one specific location for more than 12 consecutive months or that is attached to a foundation at the location. Any engine that replaces an engine at a location and is intended to perform the same or similar function as the engine being replaced will be included in calculating the consecutive time period. A stationary IC engine is not a non-road engine.

212 LEAN-BURN ENGINE – A spark-ignited engine with an air-to-fuel operating range that has more air present than is needed to burn the fuel present and cannot be adjusted to operate with an exhaust oxygen concentration of less than or equal to 2 %.

213 LOCATION – Any single site at a building, structure, facility or installation.

214 LOW SULFUR OIL – Fuel oil containing less than or equal to 0.05 % sulfur by weight.

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215 **NEW ENGINE** -An engine that is not an existing engine.

216 ~~**NITROGEN OXIDES (NO_x)**~~—Oxides of nitrogen calculated as equivalent nitrogen dioxide.

~~**217**~~**216** **PART(S) PER MILLION, DRY VOLUME (ppmdv)** – A unit of proportion equal to 10⁻⁶ that is measured on a dry basis (minus water) at 15% oxygen.

~~**218**~~**217** **PRIME ENGINE** – A principal or main use engine that is dedicated to a process or processes for the purpose of supplying primary mechanical or electrical power as opposed to an emergency engine.

~~**219**~~**218** **RATED BRAKE HORSEPOWER** - The maximum brake horsepower (bhp) specified by the engine manufacturer for the engine application, usually listed on the nameplate of the engine. If the engine has been altered so that the maximum brake horsepower is different than the rated brake horsepower on the nameplate, then the maximum brake horsepower shall be considered the rated brake horsepower.

~~**220**~~**219** **RICH-BURN ENGINE** - Any spark-ignited IC engine that is not a lean-burn engine.

~~**221**~~**220** **SPARK-IGNITION ENGINE** – An IC engine wherein the fuel is usually mixed with intake air before introduction into the combustion chamber resulting in a relatively homogeneous air/fuel mixture in the combustion chamber, at which time a spark plug then ignites the air/fuel mixture.

~~**222**~~**221** **SULFUR OXIDES (SO_x)** – Oxides of sulfur calculated as equivalent sulfur dioxide.

~~**223**~~**222** **WASTE DERIVED FUEL GAS** - Any gaseous fuel that is generated from the biodegradation of solid or liquid waste including, but not limited to, sewage sludge, digester gas, and landfill gas.

SECTION 300 – STANDARDS:

301 **LIMITATIONS FOR NEW AND EXISTING STATIONARY IC ENGINES:** An owner or operator of any engine that meets the criteria listed in Section 102 shall comply with the following:

301.1 Use any fuel that contains no more than 0.05% sulfur by weight, alone or in combination with other fuels, with the following exception: Existing supplies in storage as of October 23, 2003 of any fuel containing greater than 0.05% of sulfur by weight may be used by the owner or operator until April 22, 2005. This usage shall be reported to the Control Officer along with the dates of usage.

301.2 Obtain prior approval from the Control Officer as a provision in individual permits when using any waste derived fuel gas that contains sulfur in a concentration greater than 0.05% sulfur by weight.

302 **GOOD COMBUSTION PRACTICES / TUNING PROCEDURE:** An owner or operator shall conduct preventative maintenance or tuning procedures recommended by the engine manufacturer to ensure good combustion practices to minimize NO_x emissions. A handheld monitor may be used if so desired by the owner or operator for measurement of NO_x, CO, and concentrations in the effluent stream after each adjustment is made. This may assist in determining that the proper adjustment has been made to ensure NO_x and CO minimization. In lieu of a manufacturer's procedure, a different procedure specified by any other maintenance guideline may be used as a default procedure. The tuning procedure shall include all of the following, if so equipped, and appropriate to the type of engine.

302.1 Lubricating Oil and Filter: change once every three months or after no more than 300 hours of operation, whichever occurs last;

- 302.2 Inlet Air Filter: clean once every three months or after no more than 300 hours of operation and replace every 1,000 hours of operation or every year, whichever occurs last;
- 302.3 Fuel Filter: clean once every year or replace (if cartridge type) once every 1,000 hours of operation, whichever occurs last;
- 302.4 Check and adjust the following once every year or after no more than 1,000 hours of operation, whichever occurs last:
 - a. intake and exhaust valves
 - b. spark plugs (if so equipped)
 - c. spark timing and dwell or fuel injection timing (if adjustable), and
 - d. carburetor mixture (if adjustable).
- 302.5 Spark Plugs and Ignition Points: replace after 3,000 hours of operation or every year whichever occurs last;
- 302.6 Coolant: change after 3,000 hours of operation or every year whichever occurs last; and
- 302.7 Exhaust System: check for leaks and/or restrictions after 3,000 hours of operation or every year whichever occurs last.
- 303 **LIMITATIONS – OPACITY:** No owner or operator shall discharge into the ambient air from any single source of emissions any air contaminant, other than uncombined water, in excess of 20% opacity.
- 304 **ADDITIONAL LIMITATIONS FOR PRIME ENGINES > 250 RATED bhp:** In addition to meeting the standards in Sections 301, 302, and 303, each existing or new prime engine greater than 250 rated bhp that is not listed in Sections 103, 104, or 105, shall comply with the emission limits or control technology requirements listed in Section 304, Table 1, 2, or 3, dependent upon the type of engine.

NO_x EMISSION LIMITS OR CONTROL TECHNOLOGY REQUIREMENTS FOR EXISTING COMPRESSION-IGNITION ENGINES > 250 bhp

TABLE 1

RATED BRAKE HORSEPOWER (bhp)	ENGINE REQUIREMENTS
250-399	770 ppm _{dv} or 10 g/bhp-hr.NO _x or turbocharger with aftercooler/intercooler or 4-degree injection timing retard
400 plus	550 ppm _{dv} or 7.2 g/bhp-hr.NO _x or turbocharger with aftercooler/intercooler or 4-degree injection timing retard

**EMISSION LIMITS OR CONTROL TECHNOLOGY REQUIREMENTS FOR
EXISTING APPLICABLE SPARK- IGNITION ENGINES > 250 RATED bhp**

TABLE 2

OXIDES OF NITROGEN (NO_x)	VOLATILE ORGANIC COMPOUND (VOC)	CARBON MONOXIDE (CO)
280 ppm _{dv} or 4.0 b/bhp-hr or three-way catalyst*	800 ppm _{dv} or 5.0 g/bhp-hr or three-way catalyst*	4,500 ppm _{dv} or three-way catalyst*

* The three-way catalyst shall provide a minimum of 80% control efficiency for NO_x and CO for those engines fueled with natural gas, propane or gasoline. In addition the three-way catalyst shall also provide a minimum of at least 50% control efficiency for VOC for those engines fueled by gasoline.

EMISSION LIMITS FOR NEW SPARK OR COMPRESSION-IGNITION ENGINES > 250 bhp

TABLE 3

ENGINE TYPE	NO_x	PM*	CO
LEAN BURN (SPARK)	110 ppm _{dv} or 1.5 g/bhp-hr.	Not Applicable	4,500 ppm _{dv}
RICH BURN (SPARK)	20 ppm _{dv} or 0.30 g/bhp-hr.	Not Applicable	4,500 ppm _{dv}
COMPRESSION	530 ppm _{dv} or 6.9 g/bhp-hr.	0.40 g/bhp-hr	1,000 ppm _{dv}

* A backhalf analysis shall be performed using reference Method 202 (referenced in subsection 504.6) each time a compliance test for particulate matter emissions to meet the limitations listed in Table 3 is performed using Method 5. The results of the Method 202 testing shall be used for emissions inventory purposes.

305 EFFICIENCY ALLOWANCE

Each emission limit expressed in Tables 1, 2 or 3 may be multiplied by X, where X equals the engine efficiency (E) divided by a reference efficiency of 30 percent. Engine efficiency shall be determined by one of the following methods whichever is higher:

a $E = (\text{Engine Output}) \times (100) \div (\text{Energy Input})$

where energy input is determined by a fuel measuring device accurate to +/- 5 % and is based upon the higher heating value (HHV) of the fuel. Percent efficiency (E) shall be averaged over 15 consecutive minutes and measured at peak load for the applicable engine.

b. $E = (\text{Manufacturers Rated Efficiency [Continuous]} \text{ at (LHV)} \times (\text{LHV}) \div (\text{HHV}))$

where LHV = the lower heating value of the fuel

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Engine efficiency (E) shall not be less than 30 percent; an engine with an efficiency lower than 30 percent shall be assigned an efficiency of 30 percent for the purposes of this rule.

- 306 EQUIVALENT OR IDENTICAL ENGINE REPLACEMENT:** An equivalent or identical replacement engine that replaces an existing engine shall be treated as an existing engine for the purposes of compliance with this rule, unless the engine commenced operation or was constructed or modified after October 22, 2003, including the contractual obligation to undertake and complete an order for an engine and then it will be considered a new engine for purposes of meeting the standards for a new engine in this rule.

SECTION 400 - ADMINISTRATIVE REQUIREMENTS

401 COMPLIANCE SCHEDULE:

~~**401.1** An owner or operator of an existing or new stationary IC engine that becomes subject to any of the emission limits listed in Section 300 of this rule and that does not need modification or add-on controls to meet these emission standards shall be in compliance by April 22, 2004.~~

~~**401.2**~~**401.1**An owner or operator of an existing stationary IC engine that must be rebuilt, modified, or retrofitted with add-on control equipment to meet emission limits listed in Section 300 of this rule shall submit a compliance plan for such unit by October 22, 2004 and shall be operating in full compliance by October 22, 2006.

~~**401.3**~~**401.2**An owner or operator of an existing stationary IC engine that must be replaced with a new engine to meet emission limits listed in Section 300 and shall be in compliance with the emission limits listed in Section 304 Table 3 by October 22, 2007.

SECTION 500 - MONITORING AND RECORDS

501 COMPLIANCE DETERMINATION:

501.1 Existing Engines: Existing IC engines or engine families shall demonstrate compliance with Section 300 by recordkeeping according to Section 502. Emission testing using the applicable test methods listed in Section 503 shall be performed if the Control Officer requests.

501.2 Existing Engine Families at a Source: When testing an engine family at one source, the number of engines tested should be the greater of either one engine or one third of all identical engines in the group. If any of the representative engines exceed the emission limits, each engine in the group shall demonstrate compliance by emissions testing.

501.3 New Engines / New Engine Families: Compliance with the limitations listed in Section 304, Table 3 shall be demonstrated by either:

- a. A statement from the manufacturer that the engine meets the most stringent emissions standards found in 40 CFR Part 89 or 90 applicable to the engine and its model year at the time of manufacture or
- b. Performance of emission testing using the test methods listed in Section 503.

501.4 Low Sulfur Oil Verification: If the Control Officer requests proof of the sulfur content, the owner or operator shall submit fuel receipts, contract specifications, pipeline meter tickets, Material Safety Data Sheets (MSDS), fuel supplier information or purchase records, if applicable, from the

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fuel supplier, indicating the sulfur content of the fuel oil. In lieu of these, testing of the fuel oil for sulfur content to meet the 0.05% limit shall be permitted if so desired by the owner or operator for evidence of compliance.

- 501.5 Waste - Derived Fuel Sulfur Verification:** The owner or operator shall submit documentation of the concentration of the sulfur level of the waste derived fuel to the Control Officer.
- 501.6 Test Method Conditions:** The owner or operator shall use the test methods listed in Section 503 to determine compliance with the limitations in Section 304, Tables 1-3. Testing for stationary IC engines shall be completed under steady state conditions at either the maximum operating load or no less than 80% of the rated brake horsepower rating. If the owner or operator of an engine demonstrates to the Control Officer that the engine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous brake horsepower rating or under the typical duty cycle or typical operational mode of the engine.
- 502 RECORDKEEPING / RECORDS RETENTION:** The owner or operator of any stationary IC engine subject to this rule shall comply with the following requirements and keep records for a period of 5 years:
- 502.1** An owner or operator of any IC engine, including emergency engines, prime engines and low usage engines, shall keep a record that includes an initial one time entry that lists the particular engine combustion type (compression or spark-ignition or rich or lean burn); manufacturer; model designation, rated brake horsepower, serial number and where the engine is located on the site.
- 502.2** An owner or operator of a prime engine shall maintain a monthly record for prime engines which shall include:
1. Hours of operation;
 2. Type of fuel used, and
 3. Documentation verifying compliance with sulfur fuel content according to subsection ~~403~~ 301.1.
- 502.3** An owner or operator of a prime engine shall maintain an annual record of good combustion procedures according to Section 302.
- 502.4** An owner or operator of an emergency engine and a non-emergency low-usage engine that meets the exemptions listed in Sections 104 and 105 shall keep an annual engine record that includes:
1. Hours of operation; and
 2. Explanation for the use of the engine if it is used as an emergency engine.
- 503 TEST METHODS:** The Environmental Protection Agency (EPA) test methods as they exist in the Code of Federal Regulations (CFR) (July 1, ~~2002~~ 2004), as listed below, are adopted by reference. The American Society of Testing Materials International (ASTM International) methods listed below are also adopted by reference, each having paired with it a specific date(s) that identifies the particular version/revision of the method that is adopted by reference. These adoptions by reference include no future editions or amendments. When more than one test method is permitted for the same determination, as listed in subsections ~~503.11~~, 503.12, 503.13, ~~or~~ 503.14, or 503.15, an exceedance of the limits established in this rule determined by any of the applicable test methods constitutes a violation. Copies of test methods referenced in this section of this rule are available at the Maricopa County Environmental Services Department, 1001 North Central Avenue, Suite 201, Phoenix, Arizona, 85004 - 1942.

- 503.1** EPA Reference Methods 1 (“Sample and Velocity Traverses for Stationary Sources”) and 1A (“Sample and Velocity Traverses for Stationary Sources with Small Stacks and Ducts”) (40 CFR 60, Appendix A).
- 503.2** 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).
- 503.3** 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 of Excess Air”), and 3C (“Determination of Carbon Dioxide, Methane, Nitrogen and Oxygen from Stationary Sources”) (40 CFR 60, Appendix A).
- 503.4** EPA Reference Method 4 (“Determination of Moisture Content in Stack Gases”) (40 CFR 60, Appendix A).
- 503.5** EPA Reference Method 5 (“Determination of Particulate Emissions from Stationary Sources”) (40 CFR 60, Appendix A) ~~and possibly, if requested by the Control Officer, EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”) (40 CFR 51, Appendix M).~~
- 503.6** EPA Reference Method 202 (“Determination of Condensable Particulate Emissions from Stationary Sources”)(40 CFR 51, Appendix M).
- ~~503.6~~**503.7** EPA Reference Methods 7 (“Determination of Nitrogen Oxide Emissions from Stationary Sources”), 7A (“Determination of Nitrogen Oxide Emissions form Stationary Sources - Ion chromatographic method”), 7B (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Ultraviolet Spectrometry”), 7C (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline-Permanganate Colorimetric Method”), 7D (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Alkaline – Permanganate Chromatographic Method”), and 7E (“Determination of Nitrogen Oxide Emissions from Stationary Sources – Instrumental Analyzer Method“), (40 CFR 60, Appendix A).
- ~~503.7~~**503.8** EPA Reference Method 9 (“Visual Determination of the Opacity of Emissions from Stationary Sources”) (40 CFR 60, Appendix A).
- ~~503.8~~**503.9** EPA Reference Method 10 (“Determination of Carbon Monoxide from Stationary Sources”) (40 CFR 60, Appendix A).
- ~~503.9~~**503.10** EPA Reference Method 18 (“Measurement of Gaseous Organic Compound Emissions by Gas Chromatography”) (40 CFR 60, Appendix A).
- ~~503.10~~**503.11** EPA Reference Method 25A (“Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer”) (40 CFR 60, Appendix A).
- ~~503.11~~**503.12** American Society of Testing Materials International, ASTM Method #D1266-98 (“Standard Test Method for Sulfur in Petroleum Products (Lamp Method)”), 1998.

~~503.12~~**503.13** American Society of Testing Materials International, ASTM Method #D2622-98 (“Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-Ray Fluorescence Spectrometry”), 1998.

~~503.13~~**504.14** American Society of Testing Materials International, ASTM Method #D2880-71, 78 or 96 (“Standard Specification for Gas Turbine Fuel Oils”), 1971 or 1978 or 1996.

~~503.14~~**504.15** American Society of Testing Materials International, ASTM Method #D4294-98 (“Standard Test Method for Sulfur in Petroleum Products by Energy-Dispersive X-Ray Fluorescence Spectroscopy”) 1990 or 1998.