


San Joaquin Valley Air Pollution Control District

District Policy SSP 1830

District Rule 4702 (Internal Combustion Engines) Certification Procedure

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Approval Date: September 14, 2022

I. Purpose

This document outlines a procedure to obtain District Rule 4702 certification of an exhaust control system to be installed on full-time agricultural spark-ignited internal combustion (IC) engines for compliance with District Rule 4702.

This document is intended to supplement and further clarify the specific exhaust control system certification requirements specified in Section 9.0 of District Rule 4702.

II. Applicability

This policy applies only to exhaust control systems consisting of a non-selective catalytic reduction (NSCR) device, an air/fuel ratio (AFR) controller, and an oxygen sensor to be installed on rich-burn spark-ignited internal combustion engines used in agricultural operations for compliance with District Rule 4702.

III. Background

District Rule 4702 requires periodic monitoring and/or testing of full-time agricultural internal combustion engines that have been retrofitted with a NO_x control device in order to demonstrate ongoing compliance with the required emission standards of the rule, unless the engine and emission control device have been certified to meet the required emission standards.

District Rule 4702, Section 9.0 - Exhaust Control System Certification Requirements specifies the requirements for District certification that an exhaust control system will comply with the required emission standards. District certification shall be based upon the emission source testing results of a specific exhaust control system performed in accordance with a District-approved source test protocol. The exhaust control system vendor or equipment operator must provide the District with copies of the source test results, information on the emission control device, and a statement attesting to the accuracy of all information provided.

The requirements for District certification pursuant to Section 9.0 of District Rule 4702 are explained in greater detail in this document.

IV. Definitions

Agriculture Operations: The growing and harvesting of crops or the raising of fowl or animals, for the primary purpose of earning a living, or of conducting agricultural research or instruction by an educational institution.

Non-Selective Catalytic Reduction (NSCR): A catalytic emission control device for rich-burn IC engines that is installed on the exhaust and, in a two-step reaction, promotes the conversion of excess oxygen, NO_x, CO, and volatile organic compounds (VOC) into carbon dioxide (CO₂), nitrogen (N₂), and water.

Rich-Burn IC Engine: A spark-ignited IC engine that is operated with an exhaust stream oxygen concentration of less than four (4) percent by volume prior to any exhaust stream control device.

Spark-Ignited Internal Combustion Engine: A liquid or gaseous fueled engine designed to ignite its air/fuel mixture by a spark across a spark plug.

V. Certification Procedure

A. Application Tracking

In order to facilitate tracking, each application for District certification shall be evaluated under a "special project" in the District's Permit Applications System (PAS) within facility ID #C-7634. The special project number will represent the control system's **District Certification Number** (e.g. C-1XXXXXX). All relevant documents created and/or compiled for each certification special project shall be uploaded or scanned into the District's Electronic Document Management System (EDMS) under that special project.

B. New Proposals for Add-On Emission Control Systems

The District will consider for certification an add-on emission control system consisting of a specific manufacturer and model non-selective catalyst (NSCR) device, a specific manufacturer and model air/fuel ratio (AFR) controller, and, if applicable, a specific manufacturer and model oxygen sensor.

A vendor seeking District certification of an add-on emission control system must submit to the District and/or complete each of the following:

- Complete Engine Emission Control System Certification Application Form
- Provide Installer Approval, Training, and Information Distribution Documentation
- Provide Operator Training and Information Distribution Documentation
- Provide New Install Site Qualification Standards
- Complete applicable District Permitting or Permit Exempt Equipment Registration (PEER) requirements for test engines
- Complete Interim Certification requirements (Initial Source Testing at Two Separate Sites) and

- Complete Final Certification requirements - Durability Testing (Ongoing Portable Analyzer Testing)

Each of these steps will be discussed in further detail in this policy.

1. Application for Certification:

A vendor seeking District certification for an add-on emission control system shall submit an application package to the District Permit Services Department. The application package shall include an Engine Emission Control System Certification Application Form and all of the following information:

- Proposed name of the emission control system,
- Manufacturer and model of the proposed NSCR device,
- Manufacturer and model of the proposed air/fuel ratio (AFR) controller,
- Manufacturer and model of the proposed oxygen sensor, if applicable,
- The specific fuel for which the proposed emission control system will be certified,
- Engine horsepower range for which the proposed emission control system is suitable,
- Recommended maintenance and replacement intervals for the catalyst, AFR controller, oxygen sensor, and other major system components,
- Suitable fuel pressure range (minimum and maximum), for proper operation of the proposed emission control system, and any other required site approval criteria,
- New install site qualification checks and balances procedures,
- A warranty for the proposed emission control system. The terms of this warranty shall be clearly outlined in the application package, including the warranty period for each equipment component. The warranty shall include appropriate protection for the end user should the emission control system lose its District certification,
- Installer approval training and procedures, and
- A copy of the proposed emission control system's Operator's Manual. The Operator's Manual shall include a detailed "Troubleshooting" section that covers all possible system faults and failure modes as well as recommendations to correct each possible system fault or failure mode.

The District may allow certification of emission control system component "families" (e.g. various part numbers within a particular product line) provided the vendor submits sufficient technical justification to do so. The technical justification shall be submitted as part of the application package.

The District will use the above-provided information to establish certification criteria for the proposed emission control system.

2. Installer Approval, Training, and Information Distribution Documentation

Only systems which are installed by vendor-approved parties will be considered certified by the District. The District shall be copied or notified in writing by the vendor of new installer approvals.

The vendor shall provide thorough control system installation, calibration, operation, adjustment, maintenance, troubleshooting, and warranty training to each approved installer. The vendor shall provide the following documentation to each approved installer and the District:

- Installer approval letter,
- New site qualifications checks and balances procedure,
- Installation procedure,
- Installer calibration procedure,
- Operation manual,
- Installer adjustment procedures,
- Installer routine maintenance procedure,
- Installer trouble-shooting procedures,
- The control system's warranty and warranty procedures, and
- Any changes to previous documentation (if applicable)

3. Operator Training and Information Distribution Documentation

The vendor or approved installer shall provide thorough control system calibration, operation, adjustment, maintenance, troubleshooting, and warranty training to each owner/operator. The vendor or installer shall provide the following documentation to the engine owner/operator for each installation (prior to or at the time of the installation). The District shall also be supplied with a copy of the Operator's documentation:

- Operation manual,
- Site qualification documentation,
- Operator adjustment and calibration procedures,
- Operator routine maintenance procedure,
- Operator trouble-shooting procedures,
- The control system's warranty and warranty procedures, and
- Any changes to previous documentation (if applicable)

4. New Installation Site Qualification

The vendor or approved installer shall inform the District, in writing, of a site deemed qualified for the add-on emission control system. The information shall be sent to the District within 30 days after each installation, and shall include all of the following:

- Facility name,
- The contact (owner/operator) of the engine,
- Physical location of the engine,

- Facility mailing address,
- Contact phone number,
- Contact email address, if available,
- A log of the new install site qualification checks performed by the approved installer or vendor, and
- Where applicable, the District permit or registration number of the engine.

5. District Permitting or Registrations

Prior to installation of an IC engine or emission control system, District permitting or registration applicability should be determined. If the facility is subject to District permitting, an Authority to Construct (ATC) permit shall be issued by the District prior to installation of the emission control system. If the facility qualifies for District Permit-Exempt Equipment Registrations (PEERs), the District shall receive a PEER application prior to operation of the controlled engine.

6. Interim Certification (Initial Source Testing at Two Separate Sites)

Two separate installations of the proposed emission control system, AND a successful source test on each installation are required for interim certification. The source testing shall be performed by a California Air Resources Board (CARB)-certified independent source testing company. A list of CARB-certified source testing companies is available on the CARB website at: <https://ww2.arb.ca.gov/our-work/programs/independent-contractor-program/list-approved-independent-contractors>.

Source testing shall be conducted using the methods and procedures approved by the District. The vendor or the source testing company shall notify the District at least 30 days prior to any source test and a source test plan must be submitted to the District for approval at least 15 days prior to testing. The District-approved source test protocol shall be strictly adhered to during certification source testing. The District may witness the source test. The results of each source test shall be submitted to the District within 60 days after completion of the source test.

If granted, an interim certification will be in the form of an approval letter from the District.

Upon receipt of District Interim certification, an emission control system is considered to meet the requirements of Section 9.0 of District Rule 4702, as long as that engine meets the conditions set forth in the emission control system's interim certification letter.

An emission control system's interim certification can be amended or revoked at any time should the District determine that the system does not conform to the certification criteria.

The validity of an emission control system's interim certification is contingent upon the emission control system successfully completing the Final Certification requirements. Each emission control system must complete the Final Certification requirements within three years of the date the interim certification is issued. If the Final Certification requirements cannot be completed within three years of the date the interim certification is issued, the vendor may request a one-year extension to complete the Final Certification requirements.

The request must include an explanation of why the Final Certification requirements could not be completed within three years and will require District approval. If an emission control system fails to complete the Final Certification requirements within four years of the date the interim certification is issued, it cannot be used to satisfy the requirements of Section 9.0 of District Rule 4702.

- Should Final Certification of a system not be issued by (three years, or four years subject to District approval, after interim Certification date), engines operating under the interim certification shall be considered to be uncertified under District Rule 4702 and will be subject to the applicable periodic source testing and/or monitoring requirements of District Rule 4702.
- Until a system receives Final Certification from the District, the NO_x and CO emissions of each engine operating under the interim certification shall be monitored using a portable analyzer at least once every 12 months. Monitoring conducted as part of routine maintenance and repair actions may be used satisfy this requirement, provided that no more than twelve months elapses between monitoring actions. Should the 12-month deadline fall during a period of non-operation, the engine shall be monitoring within 30 calendar days of recommencing operations.

Rule 4702 Testing Detail:

The purpose of the source testing is to verify that the proposed emission control system will meet each of the following Rule 4702 emissions requirements:

- 11 ppmvd-NO_x @ 15% O₂,
- 2,000 ppmvd-CO @ 15% O₂, and
- 90 ppmvd-VOC @ 15% O₂

The following source test methods shall be used (pursuant to District Rule 4702):

- NO_x emissions shall be determined using EPA Method 7E or ARB Method 100.
- CO emissions shall be determined using EPA Method 10 or ARB Method 100.
- VOC emissions shall be determined using EPA Method 25A or 25B, or ARB Method 100. Methane and ethane, which are exempt compounds, shall be excluded from the result of the test.
- Stack gas oxygen concentration shall be determined using EPA Method 3 or 3A, or ARB Method 100.

- Alternative test methods may also be used to address the source testing requirements of this certification provided that the EPA, CARB, and the District approve those methods.

Source Testing shall be conducted with the engine operating at conditions representative of normal operations. To successfully demonstrate compliance with the emission requirements, the arithmetic average of the measured emission values calculated from three 30-consecutive-minute test runs must meet the standard for that pollutant. If two of three test runs are above an applicable standard, the test cannot be used to demonstrate compliance with the applicable standard.

During the interim certification testing, the vendor shall establish and record the appropriate AFR controller operating parameters necessary to demonstrate compliance with the prescribed emission requirements.

During interim certification testing, the vendor shall establish and record the minimum engine load, in brake horsepower (bhp), necessary to maintain sufficient engine exhaust temperature such that the proposed emission control system can demonstrate compliance with the prescribed emission standards. Other District-approved parameters may be used in lieu of engine load to verify the engine is maintaining sufficient exhaust temperature such that the proposed emission control system can demonstrate compliance with the prescribed emission requirements.

During the interim testing, the vendor or approved installer shall maintain records of any adjustments, modifications, and equipment or component replacements that were necessary for the proposed emission control system to demonstrate compliance with the prescribed emission standards. These adjustments, modifications, and equipment or component replacements may become part of the emission control system's certification criteria if the District deems them necessary to ensure compliance with the prescribed emission requirements.

If the emission control system fails to demonstrate compliance with the prescribed emission standards during interim certification testing, the vendor or approved installer must submit a report to the District within 30 days of the initial failure event explaining the reasons for the failure and the corrective actions necessary to remedy the failure. The District will then determine whether to allow the corrective actions and proceed with the certification process, whether additional testing is necessary, or whether to deny certification of the proposed emission control system.

7. Final Certification - Durability Testing (Ongoing Portable Analyzer Testing)

The purpose of the ongoing certification testing process is to demonstrate the proposed emission control system's durability.

In order to maintain Interim Certification status and to receive a Final Certification, the emission control system must undergo emission testing within 200 hours of each of the following operational intervals. This testing is to demonstrate that the system will maintain compliance with the prescribed NO_x and CO emission standards specified in Section

V.B.2 of this document. The emissions testing shall occur at the following intervals, as measured from the Initial Certification engine hour-meter reading:

- 2,000 hours of operation,
- 4,000 hours of operation, and
- 5,000 hours of operation.

Ongoing portable analyzer testing shall be conducted using a District-approved portable emissions analyzer. Since commercial portable emission analyzers capable of accurately measuring VOC emissions are not readily available, the emission control system must demonstrate compliance with only the prescribed NO_x and CO emission standards during the ongoing testing phase.

Each test shall be conducted with the engine operating at conditions representative of normal operations. Three 15-consecutive-minute test runs shall be conducted, and the emissions during each run shall be averaged over a 15-consecutive-minute period by either taking a 15-consecutive-minute sample reading or by taking at least 5 readings evenly spaced out over the 15-consecutive-minute period. If two of the three test runs measure emissions above the prescribed emission standard, that test cannot be used to demonstrate compliance with the prescribed emission standard.

The portable emissions analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the District.

During testing at each operational interval, the vendor shall revise and record the appropriate AFR controller's operating parameters as necessary to maintain compliance with the prescribed emission standards.

During testing at each operational interval, the vendor shall revise and record the minimum engine load necessary to maintain sufficient exhaust temperature such that the proposed emission control system can maintain compliance with the prescribed emission standards. Other District-approved parameters may be used in lieu of engine load to verify the engine is maintaining sufficient exhaust temperature such that the proposed emission control system can demonstrate compliance with the prescribed emission standards.

Should the emission control system fail to demonstrate compliance with the emission requirements at any point during ongoing testing, the vendor or operator must submit a report to the District within 30 days of the initial failure event explaining the reasons for the failure and any corrective actions necessary to remedy the failure. The District will then determine whether to allow the corrective actions and proceed with the certification process, whether additional testing is necessary, or whether to deny certification of the proposed emission control system.

The vendor or operator shall maintain records of any adjustments, modifications, and equipment or component replacement that was necessary for the proposed emission control system to demonstrate compliance with the prescribed emission standards. These

adjustments, modifications, and equipment or component replacements may become part of the emission control system's certification criteria if the District deems them necessary to ensure compliance with the prescribed emission standards.

Once two installations of a conditionally certified emission control system successfully complete 5,000 hours of ongoing emissions durability testing, the vendor may apply for their emission control system to be issued a Final Certification. If granted, a Final Certification will be in the form of an approval letter from the District.

Once an emission control system has received a Final District Certification, that system is considered to have met the requirements of Section 9.0 of District Rule 4702 and may therefore be used for District Rule 4702 compliance without additional source testing so long as that system is installed, operated, and maintained according to the vendor's/manufacture's specifications as well as any specifications set forth as part of the emission control system's certification.

An emission control system's Final Certification can be amended or revoked at any time should the District find that the system does not conform to the certification criteria.

The vendor who applies for, and receives, District certification for an emission control system shall own that certification and shall be responsible for maintaining it. The emission control system's warranty shall include appropriate protection for the end user should the emission control system lose its District certification.

C. Original Equipment Manufacturer (OEM) Certifications

Add-on emission control systems and spark-ignited internal combustion engine combinations that have been certified by CARB and/or EPA to meet the required NO_x emission standards of District Rule 4702 and are used exclusively in agricultural operations are certified spark-ignited engines as defined in District Rule 4702; these engines are not subject to the source testing requirements of District Rule 4702 and do not require District certification. Add-on emission control systems and rich-burn spark-ignited internal combustion engine combinations that have obtained certifications from other regulatory agencies (e.g. South Coast Air Quality Management District (SCAQMD)) may be evaluated under this protocol to determine if the system's certification is equivalent to the certification requirements under Section 9.0 of District Rule 4702.

For previous OEM certifications, the equivalency of such certifications will be evaluated on a case-by-case basis and is contingent upon (but is not limited to) the following:

- Emission level(s) to which the system was certified,
- Test methods and methodologies used in the approval, and
- Other factors as determined by District

If the engine with control system is determined to satisfy the requirements of certification pursuant to District Rule 4702, the unit may be treated as a certified pursuant to District Rule 4702 within a permitting project and the certification procedures described above in this document are not required.

VI. Subsequent Installations of a Certified Control System

For each subsequent installation of an interim or final certified emission control system, District permitting or registration applicability should be determined. If the facility is subject to permitting, an ATC permit shall be issued by the District prior to installation of the emission control system. If the facility qualifies for PEERs, the District shall receive a PEER application prior to operation of the controlled engine.

For each subsequent installation of an interim or final certified emission control system, an initial portable analyzer test shall be performed to ensure the control was installed properly. The portable analyzer results shall be submitted to the District within 60 days after the test. These requirements shall be identified on the engine's permit or PEER.

For each subsequent installation of an add-on interim or add-on final certified emission control system, the vendor or approved installer shall provide thorough control system calibration, operation, adjustment, maintenance, troubleshooting, and warranty training to each owner/operator. The vendor or approved installer shall provide the following documentation to the engine owner/operator for each installation (prior to or at the time of the installation) and shall maintain records that demonstrate that the following information was given to the operator:

- Operation manual,
- Site qualification documentation,
- Operator adjustment and calibration procedures,
- Operator routine maintenance procedure,
- Operator trouble-shooting procedures, and
- The control system's warranty and warranty procedures.