

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

FINAL

**RULE 2202 EMISSION REDUCTION QUANTIFICATION PROTOCOL
FOR NEW MARINE VESSEL PROJECTS**

November 2008

Deputy Executive Officer
Science and Technology Advancement
Chung S. Liu, D.Env.

Assistant Deputy Executive Officer
Science and Technology Advancement

Mobile Source Division
Henry Hogo

Technology Advancement
Matt Miyasato

Technology Implementation Manager
Science and Technology Advancement
Fred Minassian

AUTHORS:

Science and Technology Advancement
Vicki White – Program Supervisor

REVIEWED BY:

District Counsel
Kurt Wiese – General Counsel

**RULE 2202 EMISSION REDUCTION
QUANTIFICATION PROTOCOL
FOR NEW MARINE VESSEL PROJECTS**

The purpose of this protocol is to establish procedures for evaluating, approving and monitoring marine vessel projects submitted under the Rule 2202 Air Quality Investment Program (AQIP) or pursuant to Rule 2202(f)(5). The goal of this protocol is to provide incentives to owners/operators of captive marine vessels to operate cleaner burning marine engines onboard of these vessels. Marine vessel projects may include a new purchase or the repower, retrofit or remanufacture of an existing marine engine (as defined below). This protocol will provide consistency in the evaluation, approval and monitoring of all marine vessel projects generating emission reductions for the Rule 2202 program. It will also serve as guidance to applicants, boat owners, and other companies proposing to purchase a new marine engine or repower, retrofit or remanufacture an existing marine engine onboard a captive marine vessel by identifying the monitoring, recordkeeping and reporting requirements prior to project implementation. This protocol will apply to new projects that are initiated after the approval date of this protocol.

Rule 2202(f)(5) states that an emission reduction quantification protocol shall be presented to the Mobile Source Committee for review if no applicable protocol exists. With the sunset of Rule 1631 – Pilot Credit Generation Program for Marine Vessels, there is a need for a District-approved emission reduction quantification protocol for marine vessel projects. This protocol was developed for the Rule 2202 program; however, it incorporates applicable elements of other established incentive-based programs, such as the Carl Moyer Program.

Definitions:

1. AQMD waters: The California coastal water boundary for the South Coast region, as specified in the Carl Moyer Program. This area is identified in Attachment 1, and encompasses Catalina and San Clemente Islands.
2. Captive marine vessel: A marine vessel that is operated at least 75% of the time in AQMD waters. For the purpose of this protocol, the vessel is deemed to be in operation any day that an AQMD-approved electronic- monitoring device shows that the vessel speed is greater than zero knots. In addition, a vessel is deemed to be in operation during the entire period of time it is outside AQMD waters, except for those time periods where the vessel owner/operator can demonstrate to the satisfaction of the Executive Officer that the vessel is inoperable because of maintenance or repair outside AQMD waters.

3. Engine repower: The replacement of a diesel-fueled engine onboard of an existing captive marine vessel with a new, cleaner marine engine having certified emissions that provide at least a 15 percent NO_x reduction relative to the engine being replaced.
4. Engine remanufacture: The replacement of marine engine components from an existing marine engine, except the original engine block, with new applicable factory certified components including, but not limited to: fuel injectors with built-in timing systems, compressors and turbochargers, blowers, intercoolers, pistons, liners, bearings, camshafts, camshaft bearings and shells, dampers, fuel pumps, and oil and fuel filters. The engine remanufacture kit must be certified by the California Air Resources Board, US. Environmental Protection Agency or International Maritime Organization (IMO), and provide at least a 15 percent NO_x reduction relative to the engine prior to remanufacture.
5. Engine retrofit: The installation of a diesel emission control device that is verified by the California Air Resources Board to control emissions from an existing marine engine. Retrofit projects may involve, but are not limited to, the addition of a diesel particulate filter, diesel oxidation catalyst, or selective catalytic reduction technology.
6. Marine engine: A compression-ignited, diesel-fueled engine used for propulsion on a captive marine vessel. For purposes of this program, a marine engine may also include a compression-ignited, diesel-fueled auxiliary engine onboard of a captive marine vessel. Outboard engines are not included in this definition. Shore power projects that reduce marine vessel auxiliary engine emissions may be considered on a case by case basis.
7. Marine vessel: May include harbor craft or oceangoing ships, but not recreational vessels. Harbor craft may include, but are not limited to, tug boats, fishing vessels, work boats, crew boats, ferries, Coast Guard vessels, and some military vessels. Oceangoing ships usually travel internationally and may include container ships, bulk carriers, general cargo ships, tankers, military ships, auto carriers, cruise ships and ocean-going tugboats. Oceangoing ships must qualify as captive marine vessels to be eligible.
8. New purchase: The purchase of a new captive marine vessel equipped with a new marine engine.

Proposal/Application Submittal Requirements:

The proposal/application shall be consistent with all applicable local, state and federal guidelines. The proposal/application submittal requirements will be contained in the applicable Rule 2202 AQIP Request for Proposal (RFP) or Rule 2202 Implementation Guidelines. The application shall include all monitoring, recordkeeping and reporting requirements and emission reduction calculation methods that are to be used for the subject vessel.

Project Criteria:

Marine vessel projects allowed under Rule 2202 must meet the minimum project requirements specified in the latest version of the Carl Moyer Program Guidelines. Such requirements include, but are not limited to, the use of low-sulfur diesel fuel in harbor craft equipped with diesel engines as of January 1, 2006, and the requirement that each marine vessel have a U.S. Coast Guard Documentation Number or International Maritime Organization (IMO) and/or Lloyd's Number.

Only captive marine vessels are eligible for funding under the Rule 2202 AQIP. To determine captivity, the following test shall be satisfied:

Captivity Test: Minimum 75% of operation in AQMD waters:

Example of Captivity Test Calculation:

Days operated in AQMD waters:	320 days
Total operating days:	365 days

$$(320/365) * 100 = 88\%$$

A marine vessel project that is privately-funded and approved under Rule 2202(f)(5) must operate at least 75% of the time in California Coastal waters to be eligible for credit generation. However, the emission reduction credits will be granted for documented activity within AQMD waters only, as verified by AQMD.

Emission Reduction Quantification:

The emission reductions shall be quantified according to the latest version of the Carl Moyer Program Guidelines. Harbor craft propulsion and auxiliary engine emission factors, load factors, and fuel consumption rate factors can be found in Tables B-18, B-19 and B-20 of the Carl Moyer Program Guidelines (Release Date: April 22, 2008). The emission factors, load factors, and other calculation parameters used will be the most

current revisions as approved by CARB to the Carl Moyer Program Guidelines. Below are examples of the calculation methodologies:

Fuel-based Method (to be used for all propulsion engine projects):

$$\text{Emission Reductions} = ((\text{EF base} - \text{EF new}) \times \text{AL} \times \text{FC}) / 454$$

Hour-based Method (to be used for all auxiliary engine projects):

$$\text{Emission Reductions} = [((\text{EF base} \times \text{BHP base} \times \text{LF base}) - (\text{EF new} \times \text{BHP new} \times \text{LF new})) \times \text{AL}] / 454$$

Where:

- EF base = Baseline emission factor (g/bhp-hr)
- EF new = Reduced emission factor (g/bhp-hr)
- AL = Activity level (gallons/year or hours/year)
- FC = Fuel Consumption Rate (bhp-hr/gal)
- BHP = Rated Power (bhp)
- LF = Load Factor
- 454 = Conversion factor from grams to pounds

In the fuel-based method, the activity level shall include the total fuel consumed by the approved engine only while in District waters. For example, if the project involves the repowering of the main engine, the activity level must include the fuel consumed by the main engine only. Depending upon the fuel tracking method, fuel adjustments may be necessary to deduct the amount of fuel consumed by the auxiliary engines, transferred to other vessels or equipment, and/or consumed by the main and auxiliary engines during travel outside District waters. The maximum fuel rate and load factors specified in the Carl Moyer Program Guidelines should be used to calculate the amount of fuel consumed by the auxiliary engine(s).

To determine the amount of fuel consumed by the marine vessel while operating outside AQMD waters, the following equation should be used:

$$(\text{Number of out-of-basin GPS data points with speed greater than zero} / \text{GPS data points logged/hr}) \times (\text{Total fuel consumed during the reporting period} / \text{Total engine hours for the reporting period})$$

If GPS data are missing, the above calculation does not apply. Backup documentation, as pre-approved by AQMD, may be used to determine the amount of fuel consumed during travel outside AQMD waters in the event GPS data are not available. If backup documentation is not available, the vessel will be deemed in operation outside AQMD waters for the period of missing GPS data.

Emission reductions are subject to verification by the AQMD, and testing may be conducted at any time by the AQMD or a contractor designated by the AQMD.

Monitoring, Recordkeeping and Reporting:

A marine vessel project approved under Rule 2202 AQIP or Rule 2202(f)(5) must achieve real, quantifiable, enforceable, and surplus emission reductions for a discrete period of time. At a minimum, the project shall comply with all project criteria specified in the most recent version of the Carl Moyer Program Guidelines. In addition, the project shall adhere to the following monitoring, recordkeeping and reporting requirements:

Monitoring:

1. A Global Positioning System (GPS) or other electronic monitoring system and methodology as approved by the AQMD shall be installed, operated and properly maintained on the marine vessel to demonstrate its qualification as a captive marine vessel. The GPS or other electronic monitoring unit shall meet the minimum specifications established by CARB for the Carl Moyer Program (e.g., Carl Moyer Program Advisory 06-001).
2. Emission reductions will be verified and credits will be issued only for vessel operation in AQMD waters that is substantiated with GPS/electronic monitoring system data or backup documentation as pre-approved by the AQMD if GPS data are not available. The GPS or electronic monitoring system access codes and all connecting devices and software necessary for access shall be provided to the AQMD.
3. Backup documentation may be used if pre-approved by the Executive Officer or Executive Officer designee to demonstrate vessel activity during times of missing GPS data.. Backup documentation may include one or more of the following: 1) daily operating logs, including the date, time, and vessel locations for each trip taken during the day, 2) hour meter readings from the start and end of each day, or 3) if available, other documentation, such as ticket sales, Marine Exchange reports, California Dept. of Fish & Game records, or Coast Guard records, verifying that all vessel trips have been noted on the daily operating logs. Samples of the backup documentation must be submitted to AQMD at the time of application, and pre-approved by AQMD prior to project implementation.
4. A non-resettable (totalizing) hour meter shall be installed on each engine (propulsion and auxiliary), and the engine hours shall be recorded in a monthly log. Notwithstanding, if the vessel leaves AQMD waters, the totalizing meter

reading may be entered for each engine once the vessel leaves AQMD waters and upon the vessel's return. This information is not required, but it can be used by the applicant as backup documentation to determine the amount of fuel consumed outside AQMD waters. If this procedure is not followed, the vessel will be considered operating outside AQMD waters for the entire period from the first missing GPS data point until the next GPS data point is recorded. The AQMD may approve an alternative system to monitor engine operation on a case-by-case basis, provided the alternative system can produce equivalent data.

5. Should the hour meter require repair and/or replacement, a maintenance record shall be prepared and submitted to the AQMD with the activity level data report. The maintenance record shall include: the date of the repair and/or replacement, type of repair and/or replacement, meter reading at time of repair and/or replacement, and date of completion with the new meter reading. During times of meter maintenance, a hand-written log shall be maintained documenting the activity of the marine vessel on a daily basis, and shall include the date, time and estimated hours of operation for each engine. The amount of time to repair and/or replace the hour meter shall not exceed thirty working days. Failure to repair and/or replace the hour meter within thirty working days shall result in loss of emission reductions generated for the time period exceeding the thirty days.

Recordkeeping:

Contractor or Rule 2202(f)(5) applicant shall ensure that the following records are maintained:

- Fuel receipts/logs for all fuel added, including the vessel name, date, the amount of fuel added, and fueling location;
- Receipt/log for any fuel transferred to other vessels or equipment;
- Monthly log of engine hours for propulsion and auxiliary engines (auxiliary engine hours not required for propulsion engine projects equipped with Detroit Diesel Electronic Controls (DDEC) or equivalent continuous fuel monitoring system);
- A log of engine hours for propulsion and auxiliary engines for travel outside AQMD waters (not required, unless used by the applicant as backup documentation to demonstrate the amount of fuel used outside AQMD waters);
- Monthly or quarterly log of total fuel consumption (not trip fuel) from a dedicated monitoring device such as a Detroit Diesel Electronic Controls (DDEC) system, if engine is equipped with such a system;
- Emission reduction credits claimed, and the calculations demonstrating how the emission reductions were determined, and any data not already included in the proposal/application that is used to calculate the emission reductions;

- Records of any maintenance or repairs performed, including for those days the vessel was dry docked, the vessel location, date the vessel was removed from and returned to the water, and repair order, repair receipt or other documentation specifying the date(s) of service and type of maintenance/repair performed (this information is needed to document times when the vessel is not operated and for the captivity and credit determination); and
- All GPS data or other electronic monitoring data as required by AQMD shall be downloaded at least every six months from the AQMD-approved monitoring system. The data shall be recorded on a non-rewritable, non-volatile storage media, such as a CD. The original copy shall be maintained during the project life and at least three years after the termination of the contract.

The above records shall be made available to AQMD upon request for purposes of inspection and verification. Review of the above records and operations shall be made by AQMD at its discretion. Failure to produce all requested records to the AQMD within 10 business days of the request may result in loss of emission reduction credits for the time period following the request. Records shall be maintained by the project proponent during the project life and for 3 years after the termination of the contract.

Reporting:

Contractors or Rule 2202(f)(5) applicants shall submit progress reports to the AQMD every three months following contract execution or plan approval until project implementation, and then activity level data reports annually thereafter for the life of the project (applicants generating credits pursuant to Rule 2202(f)(5) may submit semi-annual activity level data and credit issuance requests in lieu of annual reporting if requested and approved by AQMD at the time of application approval). Each activity level data report shall be submitted within 60 days after the end of the reporting period to insure credit issuance is closely tied to vessel activity and the ability for AQMD staff to inspect/verify current records of activity. A time extension not exceeding 30 days may be allowed to supplement the activity data report with new information that that was not available during the 60 day period. If the report is not timely submitted, the AQMD will not approve the emission reductions for the reporting period.

The AQMD shall notify the applicant within 60 calendar days of receipt of a credit request and activity level data report as to whether or not the request contains sufficient information to be deemed complete. Upon receipt of any resubmittal or additional information after the request has been deemed incomplete, a new 30-day period shall begin. Within 90 days of submittal of a complete request, AQMD will either approve or disapprove the issuance of credits for the reporting period.

Each activity level data report shall, at a minimum, include:

- A brief description and location of operations, only if this information has changed since the original application;
- Gallons of fuel consumed by the propulsion engines and auxiliary engines (auxiliary engine data not required for propulsion engine projects equipped with DDEC or equivalent continuous fuel monitoring system);
- Dates that the report covers;
- Actual emission reductions, as calculated by the AQMD approved method;
- A brief description of any maintenance or repairs performed;
- Totalizing reading of engine hours for both the propulsion engines and auxiliary engines (auxiliary engine hours not required for propulsion engine projects equipped with DDEC or equivalent continuous fuel monitoring system);
- For travel outside AQMD waters:
 - Date the vessel left and returned to AQMD waters; and
 - Receipts or logs for all fuel added or transferred out of the vessel during the trip.
 - For marine vessel projects funded under Rule 2202 AQIP:
 - Port of Call or destination where any maintenance or repair was performed;
 - Invoice or receipt documenting date(s) and type of any maintenance or repair performed; and
 - Totalizing reading of engine hours (propulsion and auxiliary) upon leaving and returning (not required, unless used by applicant as backup documentation in the event of a GPS malfunction).
- All assumptions, calculations and factors used to determine the activity level and derive the actual emission reductions that are not already included in the proposal/application;
- GPS data or other electronic monitoring data as required by AQMD in a format that is acceptable to the AQMD; and
- If applicable, date(s) the vessel was dry docked and a brief description of the service(s) performed.

Other Conditions:

1. Emission reductions from the project approved under Rule 2202 AQIP or Rule 2202(f)(5) must not be required by any federal, state or local regulation, memorandum of agreement/understanding with a regulatory agency, settlement agreement, mitigation requirement, or other legal mandate.

2. The emission reductions will be credited for the term specified in the Rule 2202 AQIP contract or the project life specified in the Rule 2202(f)(5) application approved by the AQMD.
3. The project life shall be no more than the applicable maximum project life specified in the most recent applicable Carl Moyer Program Guidelines. The project life may be shortened by the District to that period ending on the day upon which the emission reductions are no longer surplus or the project is found to be inconsistent with any federal, state or local regulation, or District Board approved guidelines.
4. Any additional emission reductions that are achieved by the project beyond the term of the contract or plan approval will be retired for the benefit of the environment.
5. Emission reductions shall be based on actual fuel usage and operation in AQMD waters.
6. The same fuel usage reported for the NO_x emission reduction quantification shall be used as the activity level for issuing credits for VOC and CO, if any.
7. Emission reductions achieved under the contract or plan shall not be produced in whole or in part by projects funded from any public air quality-related funding program, including, but not limited to: the Carl Moyer Program or AB2766.
8. The engines being replaced shall be destroyed and rendered useless, as specified in the latest Carl Moyer Program Guidelines. Documentation shall be provided to AQMD to verify engine destruction.
9. Emission reductions achieved under the contract or plan shall be from the actual operation of the vessel under standard operating conditions.
10. If contractor or other parties involved in the project fail to adequately maintain records/logs, no emission reductions will be approved for any period in which the records/logs were not maintained.
11. All projects shall be inspected by AQMD prior to and following project implementation, except a pre-inspection is not required for public agencies as specified by the Carl Moyer Program Guidelines. Contractor or Rule 2202(f)(5) applicant shall guarantee AQMD access to marine vessels for auditing and/or inspection purposes. Invoices will not be paid by the AQMD until a post-inspection of the project has been completed by the AQMD to verify the project

was implemented as approved. This provision shall be included in the contracts and/or agreements between contractor and all other parties involved in this project.

12. The vessel owner/operator shall perform engine maintenance and service on remanufactured engines according to the original equipment manufacturer's schedule of recommend engine maintenance and service
13. Third party applications are not allowed under the Rule 2202AQIP. The owner of the engine or equipment must sign and agree to the application. A third party may complete an application or part of an application on an owner's behalf. In such cases, the application must also include a signature section for the third party. The third party signature section must include signature and date, and the third party must specify how much they are being compensated, if any, to complete the application and what source of funds are being used to pay for them. The owner must be provided with a copy of the application. The application must include a copy of the contract and/or agreement between the third party and owner.
14. Any person submitting an application who falsifies information in the application or fails to implement any provision of the application, shall be subject to penalties specified at law, including, without limitations, those in the Health & Safety Code. The AQMD may also take one or more of the following actions: 1) disapprove the application and void all previously issued credits, and/or 2) designate the applicant to be ineligible to generate credits pursuant to this program or any other District program or State program administered by the District.
15. To the extent that conflicting provisions are contained in contracts implementing vessel emission reduction credit programs, the provisions of the contract, and not of these Guidelines, are controlling.

Attachment 1

Map of AQMD Waters

