



# REQUEST FOR COMMENTS

August 12, 2010

TO: INTERESTED PARTIES  
FROM: EXECUTIVE OFFICER / APCO  
SUBJECT: **DRAFT AMENDMENTS TO REGULATION 9, RULE 10:  
*Nitrogen Oxides & Carbon Monoxide from Boilers, Steam  
Generators and Process Heaters in Petroleum Refineries  
and MANUAL OF PROCEDURES, VOLUME II, PART 5:  
*Refinery Heater Emission Verification Procedures****

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Bay Area Air Quality Management District staff requests public comments on proposed amendments to **Regulation 9, Rule 10** and proposed new **Manual of Procedures, Volume II, Part 5**. **Comments are requested by the close of business, Friday, September 10, 2010.**

## **BACKGROUND:**

Regulation 9-10 limits emissions of nitrogen oxides (NOx) and carbon monoxide (CO) from heaters at refineries. Most heaters are subject to a refinery-wide, daily average NOx limit, while heaters classified as CO boilers are subject to a daily average NOx emission rate limit of 150 ppmv. A public workshop was held to discuss proposed amendments to Regulation 9-10 on February 5, 2010. The workshop draft of the rule included one major amendment: supplementing the current NOx limit for CO boilers (150 ppmv on a daily basis) with weekly and annual limits (85.6 and 42.8 ppmv, respectively). Also, the rule was proposed to be expanded to apply to a small number of small heaters (natural gas-fired and rated 2 to <10 MM BTU/hr) that are currently exempt from the rule and from all other NOx rules. This second amendment would affect a very limited number of small heaters. The District received comments and has prepared a revised draft of the rule.

## **DISCUSSION:**

Comments after the February 5, 2010 workshop fell into five categories. A summary of the comments and staff responses follows.

**1) CO boiler NOx emission limits.** The weekly and annual CO boiler NOx limits proposed in the workshop draft were identical to limits recently imposed as "best available control technology" (BACT) on a new pair of CO boilers at a Bay Area refinery. The affected refineries commented that compliance with the proposed limits on their existing CO boilers would probably require the installation of selective catalytic reduction (SCR), and that the associated cost-effectiveness (cost per ton of reduced NOx) would be very high.

After further evaluating the existing CO boilers, the District now proposes two sets of modified NOx limits (daily and annual) in Section 9-10-307: one set for CO boilers operated in conjunction with cokers (125 ppmv daily, 85 ppmv annual), and one set for non-coker CO boilers (150 ppmv daily, 45 ppmv annual).

**2) Treatment of emissions from heaters that are subject to the refinery-wide average NOx limit, but that are in a startup, shutdown or out-of-service mode.**

Heaters may have higher-than-normal emission rates during startup and shutdown periods because low-NOx burners and other emission controls may not operate well at very low firing rates. Also, if a heater with a lower-than-average emission rate is out of service, the average emission rate at the remaining heaters will increase. For these reasons, it may be difficult or impossible for a refinery that normally complies with the refinery-wide average NOx limit to comply if certain heaters are in startup/shutdown or out of service. In order to mitigate the effect of heaters being in abnormal operating modes, Regulation 9-10 allows replacement of the true emission contribution from heaters during startup, shutdown and out-of-service periods with an emission contribution that is representative of normal operation. Following the workshop, the District received comments that the procedures for establishing the substitute emission contribution was inconsistent for startup/shutdown periods compared to out-of-service periods and that the use of the true emission contribution should always be an option, although it is not currently allowed. To address these comments, Sections 9-10-301.1 and 301.2 have been revised to make the procedures consistent in these sections and to allow use of the true emission contribution as one option.

**3) CO emission limit of 400 ppmv.** Regulation 9-10 includes a 400 ppmv daily average CO limit for all heaters. Under normal operating conditions, all heaters comply with this limit. However, during startup or shutdown periods, CO levels may increase because combustion conditions are not optimal. For consistency with the treatment of the NOx limits in the regulation, and because attempts to limit CO emissions may cause NOx emissions to rise at units equipped with low-NOx burners, an exemption has been added for the CO limit during startup/shutdown.

**4) Effect of new heaters on compliance with Regulation 9-10.** The current rule required each refinery to implement NOx controls in 2002 such that the NOx emission rate at the heaters (excluding CO boilers) did not exceed 0.033 lb NOx per million BTU of heat input on a daily average basis, with or without interchangeable emission reduction credits (IERCs). The rule allows flexibility in installing, operating and even removing NOx controls, as long as the daily average limit is not exceeded. However, no new heaters may be added to the pool of averaged heaters, and heaters must be removed from the pool if they are modified or if they are permanently removed from service. New and modified heaters are subject to “best available control technology” (BACT) NOx limits rather than the refinery-wide limit and have no effect on Regulation 9-10 compliance. Two sets of comments suggested that because Regulation 9-10 does not consider the net effect of replacing existing heaters with new heaters that have low emission levels, the rule may require installation of NOx controls on existing heaters that are not cost-effective, and that the rule ignores the net beneficial effect of certain projects that

include both existing heaters that are subject to the refinery-wide NOx limit and also new heaters that use stricter BACT controls for NOx.

By design, Regulation 9-10 is a retrofit rule that applies a refinery-wide NOx limit to a specific population of existing heaters, and that does not apply to new or modified heaters, even if the new heaters are replacements for existing heaters. If Regulation 9-10 were amended to allow consideration of the net effect of new heaters, it would negate the significant emission reductions that BACT controls achieve over time.

Although District staff proposes to proceed with an amendment that consists principally of NOx limit changes for CO boilers, to partially address this comment staff has proposed a new provision in Section 9-10-301.4 that requires that when a heater is removed from the averaged pool, the historical emission contribution from this heater continue to be included in the calculation of the refinery average. The effect of this provision is that a refinery would not be required to install additional NOx controls to compensate for a removed heater, but it would also not be able to relax existing controls to take advantage of a removed heater.

**5) Non-CEMS monitoring provisions for refinery-wide average NOx limit.** The current rule requires continuous emissions monitoring systems (CEMS) to monitor compliance with NOx and CO emissions, but allows the use of an approved “equivalent verification system”. CEMS have specific performance requirements in the District Manual of Procedures (MOP). The requirements for the “equivalent verification system” do not appear in Regulation 9-10 or in the MOP. Instead, the requirements appear in the permit conditions assigned to each refinery. For consistency with the CEMS guidelines, a new MOP chapter has been created to describe the performance requirements for non-CEMS monitoring for this rule. The requirements are similar to those that currently appear in refinery permit conditions. These changes reflect the fact that refineries have had almost 10 years to operate non-CEMS monitoring systems, so there is less need for periodic source tests, but also less reason for refineries to operate heaters under conditions where their emission rates are not known.

The revised draft rule, the February 5, 2010 workshop report, and the new Manual of Procedures chapter are available on the Air District website: <http://www.baaqmd.gov/Divisions/Planning-and-Research/Rule-Development/Rule-Workshops.aspx>. For additional information, please contact Julian Elliot, Senior Air Quality Engineer, at (415) 749-4705 or via e-mail at [jelliot@baaqmd.gov](mailto:jelliot@baaqmd.gov). **Written comments, submitted by U.S. mail or electronic mail, are requested no later than 5:00 pm, Friday, September 10, 2010.**