

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, California 94109

APPROVED MINUTES

Advisory Council Technical Committee Meeting
9:30 a.m., Monday, October 20, 2003

1. **Call to Order/Roll Call.** 9:33 a.m.
2. **Public Comment Period.** There were no public comments.
3. **Approval of Minutes of August 7, 2003.** Chairperson Harley and Mr. Lopera requested that the causes of flaring listed on page two be listed in quantitative order of importance. Dr. Holtzclaw moved adoption of the minutes as corrected; seconded by Mr. Hayes; carried unanimously.
4. **Discussion and Adoption of Recommendations on Refinery Flaring.** Chairperson Harley referred to the memorandum entitled "Advisory Council Technical Committee Report on Emissions from Refinery Flares (draft)." Committee member discussion ensued on the "Findings" section. Members of the Air District staff and the public spoke on the "Findings" as follows:

Jim Karas
Air Quality Permit Manager
Bay Area AQMD

- No. 3: the most frequent, but not the largest, source of flaring emissions are shutdowns/start-ups/turnarounds.
- No. 4: it is not likely that the refineries and staff will agree on the historical data.
- No. 5: the 98% combustion efficiency applies to large flow rates but may be lower at very low flow rates.
- No. 7: the recovery compressors eliminate 8 million cubic feet of fuel gas, and this includes all the pollutants mentioned. Improvements in reducing flare emissions are also occurring at the other refineries.

Kevin Buchan
Environmental Coordinator
Western States Petroleum Association (WSPA):

- No. 1: flares also prevent emergency conditions from emerging at a refinery.
- No. 4: the District should be asked to explain its method of calculating HC emissions from refinery flares.
- No. 6: flaring addresses not only emergency situations but also combustion of off-gases from start-ups/shutdowns/turnarounds.

Mike Deleon

Senior Environmental Engineer
Tesoro Refinery

The report presents both a balanced and scientific approach to refinery flaring issues.

Richard Quiroz
Environmental Specialist
Chevron Refinery

Finding No. 6 should describe how the flare emissions figure in the total emission inventory.

The Committee members offered their respective revisions to the “Findings” and added several revisions based on the comments from District staff and the public. The Committee then reached unanimous consensus on the following (tracked) revisions to the “Findings”:

Finding No. 1: Flare stacks are an important and necessary safety system at refineries, and are needed to deal with or prevent emergency and process upset conditions. An issue of ~~great~~ concern to the committee is the potential for large ~~releases~~emissions of ~~noxious~~ pollutants from refineries as a result of unpredictable events including such as process upsets, equipment breakdowns, earthquakes, fires, electrical power failure, accidents, and other hazards. High hydrocarbon (HC) flows to the flare system and/or loss of the steam and air supply to the flare stacks ~~can~~could cause the HC to burn in an ~~very~~ undesirable fuel-rich mode that leads to emissions of black smoke and other products of incomplete combustion in the exhaust plume. Proper design and operation of plants, including shut-down/start-up and turnarounds, can reduce non-upset emissions to a minimum.

Add a Finding 1.A to read: Air quality concerns about refinery flare emissions include possible effects on regional ozone and particulates, in and downwind of the Bay Area. For perspective, refinery flare HC emissions represent from 2 to 20 tons per day, per current estimates, which is approximately 4/10^{ths} to 4% of total Bay Area anthropogenic HC emissions.

Finding No. 2: Foul odors, visible smoke plumes, and the perception of adverse public health effects that ~~may~~might result from exposure to refinery emissions are the foremost air quality concerns among those living near the refineries.

Finding No. 3: While unit shutdowns, startups, and turnarounds are the most ~~common-frequent and necessary cause of flaring events, they may not be the largest~~ ~~they are not the largest~~ source of air emissions. Data presented to the Committee indicate that unanticipated process upsets and accidents (the second most frequent cause of flaring events) ~~that appear to~~ lead to the highest emissions.

Finding No. 4: District staff and the oil refiners are focusing at present on discussions of HC emissions from flare systems. There are large differences in the estimates of unburned HC emissions from Bay area refinery flares, ranging from ~2 tons/day (industry estimate) to over 20 tons per day (District staff estimate). ~~We do not accept either of these emission estimates at this time. Before any emissions estimates can be accepted, Improved/validated HC emission~~ estimates ~~need~~should ~~to~~ be developed, based on measurements of all relevant parameters that affect flare emissions. Those parameters include the flow rate of gas to the flare stack, the hydrocarbon content of those gases, the hydrocarbon speciation, and the hydrocarbon destruction efficiency within the flare system.

Finding No. 5: The District's recently adopted flare monitoring rule will provide measured data that can be used to improve the estimates of HC emissions. However, the adopted rule does not require address or measurement of hydrocarbon destruction efficiency in the flare system. This is an important concept that needs to be addressed before more accurate estimates can be used for planning. Optical remote sensing techniques show promise for improved measurement of HC destruction efficiency in flares. As a basis for air quality planning and assessment, iIn the absence of on-site measurements, we agree that 98% is a reasonable assumption for the HC destruction efficiency used in air quality planning and assessment.

Finding No. ~~67~~: (Renumber this as Finding No. 7 and define in an opening sentence what is meant by 98% "destruction efficiency" and how HCs can convert into compounds other than CO₂.) While we have not yet assessed the extent of their effect, we note that Fflares have the potential to emit numerous other air pollutantscompounds in addition to unburned hydrocarbons that have the potential to affect the environment. Those pollutantscompounds include carbon dioxide (a greenhouse gas); and pollutants carbon monoxide, aldehydes, and soot (products of incomplete combustion); as well as nitrogen oxides and sulfur oxides and other sulfur compounds. Emissions from some of these compounds have not yet been quantified.

Finding No. ~~76~~: Hydrocarbon emissions from flares have been reduced during the last year. This has occurred due to voluntary installation of gas recovery systems at one refinery (hydrocarbons were not recovered from the flare header at this refinery previously as they were at other refineries), improved maintenance and reliability of flare recovery systems at all the refineries, and other significant good faith efforts to reduce emissions by the refineries, and District staff efforts.

Mr. Altshuler suggested adding a finding that indicates the South Coast AQMD and the State of Texas are also studying refinery flares. Chairperson Harley replied that, instead, Recommendation No. 2 should also urge the District to track these studies, and the Committee members concurred.

Chairperson Harley called for discussion on the report's "Recommendations" and brief discussion ensued. The following comments from the Air District staff and the public were received:

- Mr. Buchan opined that a flare control should be supported by actual data, without which a rule should not be adopted. The District and the refineries will likely reach greater agreement on the data from the flare-monitoring rule than on the historical data.
- Mr. Karas noted that District rules must be based on emissions reductions that are real, quantifiable, and enforceable. Emissions reductions cannot be claimed in the absence of a regulation that requires them.
- Mr. Deleon observed that in terms of capturing initial emission reductions there may be options to the more standard practices for claiming them. Recommendation No. 3 presumes that a flare control rule will be needed. Flare monitoring data will determine this.

Chairperson Harley added that he recently received District literature scheduling public meetings to discuss refinery flare control, and this contrasts with his previous impression that this matter was only at a conceptual stage. Mr. Lopera commented that these meetings might rather be intended to solicit public input on flare control. This approach would seem to be parallel to the Technical Committee's current evaluation of flare combustion efficiency and monitoring issues.

Mr. Karas clarified that these public meetings are educational and do not include regulatory language. However, the District is obliged to adopt “all feasible measures,” and a first step may be to capture the emission reductions already achieved. Messrs. Hayes and Altshuler suggested that such emission reductions could be incorporated into the baseline of the emissions inventory.

Mr. Altshuler suggested that the Council should not opine on flare control policy *per se* but instead recommend that flare-monitoring data be obtained first and reserve judgment on the appropriate action for the District Board of Directors. Mr. Hanna replied that if the District is pursuing a rule, the Committee may express its opinion that the rule should be based on actual data rather than assumptions. The Committee reached consensus that a flare control rule should be based on data obtained from the flare-monitoring rule and be developed only if there are data supporting it.

The Committee members offered their respective revisions to the “Recommendations” and added several revisions based on the comments from District staff and the public. The Committee then reached unanimous consensus on the following (tracked) revisions to the “Recommendations”:

Recommendation No. 1: District staff should work collaboratively with refineries to develop improved estimates of HC emissions from flares at refineries, using new data resulting from the adopted rule on flare monitoring. The refining industry, refinery neighbors and other interested parties should be kept informed and consulted as this effort progresses.

Recommendation No. 2: District staff and refiners should investigate further the use of optical remote sensing or other appropriate plume monitoring techniques to measure the HC destruction efficiency in flare systems. Additional investigation of the issue is warranted and necessary, including review of the results of a study on flare destruction efficiency being conducted by the Texas Council on Environmental Quality on flare destruction efficiency, and the South Coast AQMD flare monitoring and control activities.

Recommendation No. 3: ~~Refiners should be encouraged to install backup systems to insure flares continue to burn in a smokeless condition, with high HC destruction efficiency, whenever possible, and especially during serious emergency situations.~~ Adoption of any control rule directed at refinery flares should incorporate and be based upon data gathered under the recently adopted flare monitoring rule.”

5. **Committee Member Comments.** Mr. Altshuler noted that last week the Air Resources Board (ARB) proposed to grant diesel particulate trap manufacturers three more years to meet the 20% nitric oxide (NO₂) emissions cap. Staff will conduct microanalyses of tunnels, street canyons, and garages to ascertain whether there is an acute NO₂ exposure problem. Last Thursday, the ARB issued a report on exposure to toxics from school bus emissions. The ARB is also considering an ambient NO₂ air quality standard. The time line for further actions on this standard is not yet known.
6. **Time and Place of Next Meeting.** 9:30 a.m., Tuesday, December 9, 2003, 939 Ellis Street, San Francisco, California 94109.
7. **Adjournment.** 12:28 p.m.

James N. Corazza
Deputy Clerk of the Boards