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Category: 41 – Afterburners

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

Date: December 1, 1980

Subject: Revised Seasonal Afterburner Policy

From: Walter C. Barber, Director
Office of Air Quality Planning and Standards (MD-10)

To: Director, Air and Hazardous Materials Division
Regions I-X

On July 28, 1976, the Agency issued its policy on the "Seasonal Operation of Natural Gas-Fired Afterburners." This policy authorized the approval of SIP revisions without a detailed, time-consuming analysis of air quality impact if the seasonal shutdown period was consistent with that delineated in a staff study ("Oxidant Air Quality and Meteorology," February 6, 1976) and if existing air quality showed no past violations in the months during which the afterburners were shut down. Because of the nation's continuing need to conserve energy resources and because of the revision to the national ambient air quality standard for ozone, we have reconsidered a portion of this policy.

An analysis of available ambient air quality data concluded that exceedances of the revised national ambient air quality standard for ozone do not occur in the November through March period, except for areas of southern California and the Gulf Coast. As a result of this analysis, it is appropriate at this time to modify the "seasonal afterburner policy" to state that any plan revisions which provide for afterburner shutdown in the period of November through March outside of southern California and the Gulf Coast should be proposed for approval. All other portions of the original policy remain unchanged, namely:

- (1) The policy applies to gas-fired afterburners installed to control emissions of volatile organic compounds (VOCs) for the purpose of reducing ambient ozone concentrations. It does not apply to flares (which do not use natural gas as an auxiliary fuel), VOCs vented to boilers, afterburners operated principally for odor control, or afterburners operated to control toxic or hazardous substances; and
- (2) A policy to seasonally control afterburners can only be implemented through the SIP process. The attached staff report, supported by air quality data, should be adequate technical support for approving a SIP revision allowing for seasonal shutdown of afterburners in a given location.

It is recommended that you notify the State agencies in your Region that EPA supports a policy which permits sources to shut off afterburners during the months of November through March except for areas of southern California and the Gulf Coast. Should you have any questions in this regard, please contact Mr. Richard G. Rhoads, Director, Control Programs Development Division, Office of Air Quality Planning and Standards at FTS 629-5251.

Attachment

cc: Chief, Air Programs Branch, Regions I-X

Attachment

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, D. C. 20460

JUL 28 1976

Office of
Air and Waste Management

SUBJECT: Seasonal Operation of Natural
Gas-Fired Afterburners

MEMO TO: Regional Administrators

It has been estimated that the use of afterburners for control of air pollutants required 0.4 percent of the total 22 trillion cubic feet of natural gas consumed in 1975 in the U.S. While not a high percentage, this is a substantial amount of natural gas--equivalent, for example, to the annual amount required to heat 62,000 homes in Washington, D. C.

Many of these afterburners are required solely to reduce emissions of hydrocarbons to control ambient oxidant levels. However, results from both statistical analyses of ambient data and smog chamber tests show that oxidants do not readily form at temperatures below about 59 degrees F. Thus, in many parts of the U.S., the operation of afterburners required for oxidant control may not be needed during the winter months. This fact and the expectation that natural gas will be in short supply during the coming winter support an EPA policy of allowing states to permit natural gas-fired afterburners to be shut down during the coming winter season provided there is reasonable assurance that this action will not jeopardize the attainment or maintenance of the oxidant standard. The situation in future winters should be evaluated in light of then-existing circumstances.

The policy applies to gas-fired afterburners installed to control hydrocarbon emissions for the purpose of reducing ambient oxidant concentration. It does not apply to flares (which do not use gas as an auxiliary fuel), hydrocarbons vented to boilers, afterburners operated principally for odor control, or afterburners operated to control toxic substances. Some afterburners which control hydrocarbon emissions also control, either primarily or secondarily, the emissions of carbon monoxide and particulate matter. The seasonal shutoff of some of these also could be permitted if neither the attainment nor the maintenance of the ambient standards for those pollutants is jeopardized.

Measurements of oxidant air quality indicate that ambient concentrations diminish substantially in many northern areas during the winter; northern urban areas in which summertime oxidant concentrations often exceed the national standard by large amounts experience greatly reduced concentrations during the winter season. This observed

seasonal phenomenon is consistent with the theory of oxidant formation; high ambient temperatures and strong sunlight assist in the production of oxidants from a complex photochemical reaction involving hydrocarbons and nitrogen oxides.

A recent analysis of oxidant air quality data and meteorological data¹ identifies areas of the country which, during specified months, experience low oxidant concentrations. This analysis shows a high correlation between maximum daily temperatures and maximum hourly oxidant concentrations, with concentrations above the national standard becoming highly improbable when maximum daily temperatures are consistently below 59 degrees F. The analysis suggests that the maximum daily temperature can be used as a reasonably reliable indicator of the potential for oxidant formation and supports a policy which would permit seasonal use of natural gas-fired afterburners in many areas.

Figure 1 is a map of the U. S. on which study results are summarized. It shows general areas (or zones) in which seasonal shutoff of natural gas-fired afterburners could be considered. However, it is important to note that local conditions may obviate seasonal control even though shutdown otherwise may appear to be acceptable. If, for example, winter-time oxidant concentrations in a particular area are in violation of the ambient standard, or the concentrations are sufficiently high that afterburner shutdown could create violations, you should neither encourage nor allow seasonal afterburner operation even though the area is in a theoretically acceptable zone.

A policy to seasonally control afterburners can only be implemented through the SIP process – by establishing new oxidant SIPs or by revising existing SIPs. Of course, the enforceability of the policy must be carefully considered in reviewing each specific regulation. The approval of SIP changes to permit seasonal afterburner operation need not require detailed, time-consuming analyses of air quality impacts if the seasonal shutdown time period is consistent with the zones delineated in Figure 1, and if existing air quality data shows no past violations in the month during which the afterburners will be shutdown. The attached staff study, supported by air quality data where available, normally should be adequate technical support for a decision to approve the seasonal operation of afterburners in a given location. If an occasional high oxidant concentration has been noted during the winter months but the gas savings to be achieved by afterburner shutoff appears to warrant favorable consideration of a variance request, a short trial period to test the impact on oxidant concentrations may be suggested. If it is found that ambient violations persist or are exacerbated, the trial program must be terminated.

It is recommended that you notify those state agencies in your Region which may be eligible to implement this program that EPA supports a policy which would permit sources to shut off afterburners during cold weather months this year when oxidant concentrations are below the ambient standard. In

¹ See attached OAQP "Staff Study: Oxidant Air Quality and Meteorology," dated February 6, 1976.

discussing this policy with state agency personnel, it is important to emphasize that the policy pertains only to oxidant control strategy and that EPA is not encouraging a wide-spread increase in hydrocarbon emissions. Moreover you must make it clear that, consistent with section 116 of the Clean Air Act, the state is not required in any way to relax its strategy.

Roger Strelow
Assistant Administrator
for Air and Waste Management

Enclosure

cc: Stan Learo
William Frick

Figure 1. Areas for Which the Probability of Maximum Daily Temperature > 59 degrees F is <5% During Monthly Ranges Indicated (Based on 5 Years of Temperature Data). (Map of United States – Not Available)