



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

October 4, 1991

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Clarification on the Use of Periods Longer Than 24 Hours for Compliance Evaluation of Volatile Organic Compounds (VOC) Capture and Control Systems

FROM: G. T. Helms, Chief
Ozone/Carbon Monoxide Programs Branch

TO: Air Branch Chiefs, Regions I-X

This memo is intended to clarify the confusion over the collection and use of "longer than 24-hour" measurements of carbon adsorber performance to certify compliance with VOC State implementation plan (SIP) emission limits. We are not modifying Agency policy requiring daily compliance; but rather, in certain limited situations where technological reasons dictate, we are proposing to allow longer-term measurements to be used in establishing the basis to determine daily compliance.

Introduction

The EPA has established policy requiring that VOC emission sources comply with emission regulations on a daily (24-hour) basis. The Printing Industry of Illinois lawsuit over the Chicago Federal implementation plan (FIP), however, has raised the issue of the technical validity of a daily compliance rule for VOC control systems employing adsorption units for solvent recovery and recycle. Unfortunately, our efforts to address this daily compliance issue have created some confusion and concern within various Regional Offices and other EPA offices about the current status of EPA's daily compliance policy.

The purpose of this memorandum is to clarify the confusion between EPA's long-standing daily compliance policy and the approach being considered to resolve the issues under litigation in the Chicago FIP case.

Daily Compliance Policy

First and foremost EPA remains committed to its basic tenet of daily compliance in its policies on VOC emission regulation. This position is necessitated by our mandate to attain and maintain the daily ozone ambient air quality standard. We recognize, however, that in specific cases, namely certain configurations of solvent recovery carbon adsorption systems as found in the printing industry, direct measurement by daily compliance monitoring using the liquid-liquid balance method on a 24-hour basis may not be technically appropriate.

For these special cases, we have devised an approach based on the concept of a "rolling daily average" to monitor continuous compliance with VOC emission regulations. The details of this rolling

average methodology are now being developed and the support documentation prepared for your review and comment. During the formulation phase of this approach, we discussed the basic concept with staff members in the Regional Offices and other divisions within OAQPS. These preliminary discussions have probably contributed to some of the confusion regarding continued commitment to our daily compliance policy.

In the proposed rolling average approach, the goal is to provide a general site-specific methodology that will define the shortest, technically feasible averaging period that can be used to collect compliance information. It should be pointed out that while the rolling average method, strictly speaking, uses daily liquid inventory balance data spanning a period longer than 24 hours, the method does yield a new computed value of the control system's solvent recovery efficiency every day. These daily rolling average values can still be used as an indicator of day-to-day performance compliance of the VOC control system.

Applicability of Rolling Average Method

Under strict daily compliance guidelines, the operating data used to indicate the amount of VOC emissions on a given day is limited to that day only. While this is the preferred method in ascertaining daily control system performance and can be used in most situations, there are some cases where using only the operating data over each single 24-hour period to determine control system performance is not technically valid because the amount of solvent recovered during the period does not correspond to the amount of solvent fed to the process during the same period. This difficulty has been borne out in the case of some carbon adsorption-based solvent recovery control systems where a liquid inventory balance over a single 24-hour period was used to measure actual overall capture and control performance by the occurrence of recovery efficiencies of 0 and exceeding 1 during ostensibly normal adsorption system operation.

For example, in a printing facility employing a carbon solvent recovery system, two factors (system delay time and unmeasured solvent loading in the adsorbers and press reservoirs) may preclude the use of a 24-hour liquid balance as a true measure of recovery efficiency over the same 24-hour period. The system delay or holdup time is the length of time it takes the solvent entering the press to work its way through the press reservoirs and adsorbers and be recovered. Depending on the relative solvent holding capacities of system units and the solvent feed rate to the presses, this delay time may be longer than 24 hours.

When solvent inventory measurements are made, the quantity of solvent in the press reservoirs and in the carbon adsorbers is not measured. Since these unmeasured solvent levels vary with time and are generally not the same level during each liquid inventory measurement, changes in this unmeasured solvent inventory impacts the recovery efficiency in the same way as if it were lost to the atmosphere.

The solvent recovery efficiency of the system is the ratio of the quantity of solvent recovered to the quantity of solvent fed to the process over a specified time period. If a single 24-hour period is used to determine the recovery efficiency, the quantity of recovered solvent may not correspond to the quantity of solvent fed during that same period because of the above two factors. By combining daily inventory measurements over several consecutive days, the effects of these two factors on the recovery efficiency value is reduced, thereby allowing the efficiency value to approach its "true" value.

The number of 24-hour inventory periods that should be used in computing the rolling average value of the recovery efficiency depends on the size, configuration, and range of solvent throughput of

the facility. The rolling average methodology that is being developed will provide a means of determining the number of daily inventory balances to be used in computing the rolling average value of the recovery efficiency for each specific source. As mentioned earlier, although inventory balances covering more than one 24-hour period are used to compute a recovery efficiency, a new recovery efficiency value is determined each day. The daily values may still be used as indicators of daily compliance in the same way as a strict 24-hour value is used under EPA's daily compliance policy.

Summary

This "rolling daily averaging" method is now being developed and will be available for your review and comment within the next several weeks. I plan to convene a meeting of the VOC Policy Work Group in December to address a number of VOC issues, and hope to discuss this issue of averaging time at that meeting.

cc: John Rasnic, SSCD
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