



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

MAY 17 2005

OFFICE OF
AIR AND RADIATION

J. L. Blatt
Authorized Account Representative
Union Carbide Corporation
P.O. Box 8361
3200/3300 Kanawha Turnpike
South Charleston, WV 25303

Re: Petition to Amend the Site-Specific Default F-factor for Unit 27 at Union Carbide's South Charleston Plant (Facility ID (ORISPL) 880026)

Dear Mr. Blatt:

This is in response to your January 19, 2005 petition under §75.66, in which Union Carbide Corporation (UCC) requested approval of a site-specific default F-factor for purposes of reporting nitrogen oxides (NO_x) mass emissions and heat input data for Unit 27 at its South Charleston facility. EPA approves the petition, with conditions, as discussed below.

UCC's South Charleston, West Virginia facility consists of three boilers, Units 25, 26 and 27, which are subject to the NO_x Budget Program under the West Virginia Division of Air Quality (WVDAQ) Series 1 regulation. For Units 25, 26 and 27, this regulation requires UCC to continuously monitor and report ozone season¹ NO_x mass emissions and heat input beginning on May 1, 2003, in accordance with Subpart H of 40 CFR Part 75.

Unit 27 is a natural gas-fired boiler with a rated capacity of 250,000 pounds of steam per hour. Occasionally, process vent gases are co-fired with natural gas in the boiler. Vent gases account for only about 2 to 4% of the total heat input to the unit. UCC uses a dry extractive NO_x -diluent continuous emission monitoring system (CEMS) and a stack flow monitor to meet the NO_x Budget Program monitoring and reporting requirements for Unit 27. NO_x emission rate (lb/mmBtu) is calculated using Equation F-5 in Appendix F of 40 CFR Part 75, heat input rate is calculated using Equation F-18, and NO_x mass emissions are determined using Equation F-24.

Both Equations F-5 and F-18 have a dry-basis F-factor term (F_d). F-factors are fuel-specific. For natural gas combustion, Part 75 specifies a F_d value of 8,710 dscf/mmBtu. However, no F_d values are given in Part 75 for the types of vent gases combusted in Unit 27. This raises a question as to the appropriate F_d value to use when vent gases and natural gas are

¹ The ozone season extends from May 1 through September 30.

co-fired in the unit. In a September 3, 2002 petition, UCC proposed to use a constant F_d value of 9,086 dscf/mmBtu for hours in which natural gas and vent gases are co-fired. The proposed F_d was a prorated value, which was derived using Equation F-8 in Appendix F of Part 75 in conjunction with maximum potential vent gas flow rates, fuel sampling data for the vent gases, and representative process data (i.e., average values recorded over a one-year period from October 1, 2000 to September 30, 2001). EPA approved the petition on March 25, 2003.

In a subsequent petition to EPA on November 4, 2003, UCC indicated that it planned to make a change in the operation of Unit 27. UCC stated that the combustion of PVA, one of the vent gases previously used, would be permanently discontinued prior to the 2004 ozone season, and that another vent gas (POV) would be combusted in the unit instead. UCC therefore recalculated the site-specific F-factor for Unit 27, using the same methodology that was approved by EPA on March 25, 2003. In the calculations, UCC replaced the maximum flow rate, heating value, and F-factor for PVA with the corresponding values for POV. The results of the calculations indicated that when POV is combusted instead of PVA, a slightly higher default F-factor of 9,349 dscf/mmBtu would be appropriate. EPA approved the use of this F-factor on April 29, 2004.

However, since then, UCC has changed its plans regarding the PVA plant, and has indicated that the plant will be reactivated prior to the 2005 ozone season. Therefore, in the 2005 ozone season and beyond, PVA will occasionally be combusted in Unit 27. In view of this, on January 19, 2005, UCC once again petitioned EPA for permission to use a re-calculated default F-factor for Unit 27. UCC determined the proposed default F-factor (9,367 dscf/mmBtu) using the calculation method that was approved by EPA on March 25, 2003. The maximum flow rate, heating value, and F-factor for PVA were simply re-introduced into the calculations along with the corresponding values for the other vent gases.

In the January 19, 2005 petition, UCC indicated that the operating status of the process units at the South Charleston facility is subject to change, and it may be necessary to revise the default F-factor from time-to-time, depending on which vent gases are routed to Unit 27. UCC therefore requested permission to re-calculate the default F-factor as often as needed and offered to keep records of these calculations for Agency review.

EPA's Determination

EPA reviewed the data and calculations presented by UCC to justify using a constant F_d value of 9,367 dscf/mmBtu during periods when natural gas and vent gases (including PVA) are co-fired in Unit 27. The proposed F_d value, which was derived using the methodology approved in the March 25, 2003 petition response, is conservatively high, having been derived using maximum potential flow rates for the vent gases. This will have no impact on the reported NO_x mass emissions from Unit 27, because the F-factor is in the numerator of the NO_x emission rate equation and in the denominator of the heat input rate equation. Therefore, F_d cancels out when these equations are multiplied together to determine the NO_x mass emissions. Further, using this F_d value in Equation F-18 will result in heat input rates that are conservatively low, thus ensuring that Unit 27 will not receive more NO_x allowances than appropriate, based on unit heat input. In

light of these considerations, EPA approves the use of the proposed F_d value of 9,367 dscf/mmBtu, for periods when natural gas and vent gases (including PVA) are co-fired in Unit 27. This F_d value supersedes the previously-approved value of 9,349 dscf/mmBtu and is effective as of the date of receipt of this petition approval.

EPA also conditionally approves UCC's request to re-calculate the default F-factor for Unit 27 as needed, on the condition that UCC keeps records of these calculations for review by EPA and WVDAQ. No further petitions under §75.66 are necessary for these F-factor re-calculations, provided that UCC continues to use the same F-factor calculation methodology for vent gas combustion that was approved by EPA on March 25, 2003 and applies that methodology to vent gases for which the methodology is approved in today's letter or in EPA's March 25, 2003 or April 29, 2004 letters.

EPA's determination in this letter relies on the accuracy and completeness of the information provided by UCC in the January 19, 2005 petition and is appealable under Part 78. If you have any questions about this determination, please contact Robert Vollaro, at (202) 343-9116. Thank you for your continued cooperation.

Sincerely,

A handwritten signature in black ink, appearing to read "Sam Napolitano", with a stylized, flowing script.

Sam Napolitano, Director
Clean Air Markets Division

cc: Jerry Curtin, EPA Region III
Laura Crowder, West Virginia DEP, Division of Air Quality
Robert Vollaro, CAMD