Question 14.5

Topic: Appendix D and E Missing Data Procedures -- DAHS Verification

Question: What should I do to certify that the Appendix D and E missing data routines are properly programmed within my DAHS?

Answer: For all initial certifications, all DAHS replacements, and for significant modifications to an existing DAHS that may impact the calculation of substitute data values, EPA expects the owner or operator to demonstrate that the DAHS correctly substitutes missing data according to the requirements of Part 75. For Appendices D and E:

(1) The documentation for demonstrating correct missing data substitution should include a list of all of the tests performed. Include dates, times and results. EPA recommends that you use the format in the "Appendix D and E Missing Data Verification Checklist" (see below), but regardless of whether the format in the checklist is used, all of the applicable tests listed in the checklist are required; and

(2) The results of the verification tests for the missing data routine must be available on-site in a format suitable for inspection.
For initial certifications, report a <Test Summary Data> record for the DAHS verification to CAMD, along with the results of the certification tests in electronic format (see section 4.0 of the "ECMPS Reporting Instructions for Quality Assurance and Certification"). Also include a statement along with the hard copy test report (which goes to the EPA Region and to the State), indicating that the automated Data Acquisition and Handling System (DAHS) was tested and that proper computation of the missing data substitution procedures was verified according §75.20(c)(10).

References: § 75.20(c)(10); § 75.63; Appendix D; Appendix E

History: First published in July 1995, Update #6; revised in March 1997, Update #11; revised in October 1999 Revised Manual; revised in October 2003 Revised Manual; revised in 2013 Manual

Appendix D and E Missing Data Verification Checklist

Please enter a "P" for any test that was performed and passed, an "F" for any test that was performed and failed, and an "NA" for any test that is not applicable to the DAHS being tested.

Appendix D Fuel Flow Rate Missing Data -- Single-Fuel Hours, Load-Based Units (§§ 2.4.2.2.1 and 2.4.3)

For each single-fuel hour in the missing data period (i.e., each hour in which only one type of fuel was combusted), verify that:

	(1) The DAHS performs a lookback through the quality-assured fuel flow rate data for the previous 720 operating hours when only that same type of fuel was combusted, and substitutes the arithmetic average fuel flow rate at the corresponding load range.
	(2) The DAHS substitutes the average fuel flowrate from the next available higher load range if no quality-assured data is available, at the corresponding load range.
	(3) The DAHS substitutes the maximum potential fuel flow rate (as defined in Section 2.4.2.1 of Appendix D) if no quality-assured data is available at either the corresponding load range or a higher load range.
	(4) When it is necessary to look back more than three years prior to the missing data period to find the required 720 hours of data, the DAHS excludes data from more than three years prior to the missing data period in performing the appropriate missing data substitution in (1), (2) or (3), above.
	(5) For a new or newly-affected unit, when fewer than 720 hours of fuel flow rate data are available for the required lookback, the DAHS performs the appropriate missing data substitution in (1), (2) or (3), above, using whatever data are available.

Appendix D Fuel Flow Rate Missing Data – Single-Fuel Hours, Non Load-Based Units (§§ 2.4.2.2.2, and 2.4.3)

The following assumes that the owner or operator has not received permission from the Administrator under § 75.66 to segregate the fuel flow rate data into operational bins. For each single-fuel hour in the missing data period, verify that:

	(1) The DAHS performs a lookback through the quality-assured fuel flow rate data for the previous 720 operating hours when only that same type of fuel was combusted, and substitutes the arithmetic average of the hourly fuel flow rates.
	(2) When it is necessary to look back more than three years prior to the missing data period to find the required 720 hours of data, the DAHS excludes data from more than three years prior to the missing data period in performing the appropriate missing data substitution in (1), above.
	(3) For a new or newly-affected unit, when fewer than 720 hours of fuel flow rate data are available for the required lookback, the DAHS performs the appropriate missing data substitution in (1), above, using whatever data are available.
	(4) If there is no quality-assured flow rate data available for the fuel, the DAHS substitutes the maximum potential fuel flow rate, as defined in Section 2.4.2.1 of Appendix D.

Appendix D Fuel Flow Rate Missing Data -- Co-Fired Hours, Load-Based Units (§§ 2.4.2.3.1, 2.4.2.3.3, 2.4.2.3.4 and 2.4.3)	
For each co-fired hour in the missing data period, (i.e., any hour in which two different types of fuel are combusted -- e.g., oil and gas), verify that:	
	(1) In an hour when the fuel flow rate is missing for *one fuel only*, the DAHS looks back through the quality-assured fuel flow rate data for the previous 720 hours in which that fuel was co-fired, and substitutes the maximum flow rate for the fuel, at the corresponding load range.
	(2) If quality-assured data are not available at the corresponding load range but are available at a higher load range, the DAHS substitutes the maximum flow rate for the fuel at the next higher available load range.
	(3) If quality-assured data are not available at the corresponding load range or a higher load range, the DAHS substitutes the maximum potential flow rate for the fuel, as defined in Section 2.4.2.1 of Appendix D.
	(4) In an hour when the fuel flow rate data is missing for *both* fuels, the DAHS performs the appropriate substitution, in (1), (2) or (3) above, for each fuel separately. Note: If this causes the reported hourly heat input rate to exceed the maximum rated hourly heat input of the unit, Section 2.4.2.3.4 of Appendix D requires the substitute fuel flow rate values to be adjusted so that the reported hourly heat input rate equals the unit's maximum rated hourly heat input. However, manual adjustment of the flow rates is permitted in this case, i.e., the adjustments do not have to be performed automatically by the DAHS.
	(5) When it is necessary to look back more than three years prior to the missing data period to find the required 720 hours of data, the DAHS excludes data from more than three years prior to the missing data period in performing the appropriate missing data substitution in (1) through (4), above.
	(6) For a new or newly-affected unit, when fewer than 720 hours of fuel flow rate data are available for the required lookback, the DAHS performs the appropriate missing data substitution in (1) through (4), above, using whatever data are available.
Appendix D Fuel Flow Rate Missing Data -- Co-Fired Hours, Non-Load-Based Units (§§ 2.4.2.3.2, 2.4.2.3.3, 2.4.2.3.4 and 2.4.3)	
The following assumes that the owner/operator has not received permission from the Administrator under § 75.66 to segregate the fuel flow rate data into operational bins. For each co-fired hour in the missing data period, verify that:	
	(1) In an hour when the fuel flow rate is missing for one fuel only, the DAHS looks back through the quality-assured fuel flow rate data for the previous 720 hours in which that fuel was co-fired, and substitutes the maximum flow rate for the fuel.
	(2) If no quality-assured fuel flow rate data for co-fired hours are available, the DAHS substitutes the maximum potential fuel flow rate, as defined in 2.4.2.1 of Appendix D, for each missing data hour.
	(3) In an hour when the fuel flow rate data is missing for both fuels, the DAHS performs the appropriate substitution, in (1) or (2) above, for each fuel separately. Note: If this causes the reported hourly heat input rate to exceed the maximum rated hourly heat input of the unit, Section 2.4.2.3.4 of Appendix D requires the substitute fuel flow rate values to be adjusted so that the reported hourly heat input rate equals the unit's maximum rated hourly heat input. However, manual adjustment of the flow rates is permitted in this case, i.e., the adjustments do not have to be performed automatically by the DAHS.

	(4) When it is necessary to look back more than three years prior to the missing data period to find the required 720 hours of data, the DAHS excludes data from more than three years prior to the missing data period in performing the appropriate missing data substitution in (1), (2), or (3), above.
	(5) For a new or newly-affected unit, when fewer than 720 hours of fuel flow rate data are available for the required lookback, the DAHS performs the appropriate missing data substitution in (1), (2) or (3), above, using whatever data are available.
	Simplified Fuel Flow Rate Missing Data Procedure for Peaking Units (§ 2.4.2.1)
	If the owner or operator elects to use the simplified missing data option in Section 2.4.2.1 of Appendix D for a peaking unit, verify that the DAHS substitutes the maximum potential fuel flow rate (as defined in Section 2.4.2.1 of Appendix D) for every hour of missing fuel flow rate data.
	Appendix D Missing Data -- Sulfur Content, GCV and Density (§ 2.4.1)
	When sulfur content, density or GCV data are missing or invalid for any periodic fuel sampling and analysis required under Section 2.2 or 2.3 of Appendix D, verify that the DAHS substitutes the appropriate maximum potential sulfur content, SO_2 emission rate, GCV, or density for the fuel, from Table D-6 of Appendix D.
	Appendix E Missing Data (§§ 2.5.1, 2.5.2, 2.5.2.1, 2.5.2.2)
	(1) For any operating hour in which the quality assurance operating parameters are not within the limits specified in the monitoring plan, verify that the DAHS substitutes the maximum NO_x emission rate recorded during the last series of baseline tests, for each hour of the missing data period, except as noted in (2) or (3), below.
	(2) When the measured hourly heat input rate exceeds the highest heat input rate measured during the most recent Appendix E test, verify that the DAHS either: (a) Substitutes the higher of the NO_x emission rate obtained by linear extrapolation of the correlation curve or the fuel-specific maximum potential NO_x emission rate (MER), for each hour of the missing data period; or (b) Substitutes 1.25 times the highest NO_x emission rate from the baseline correlation tests, not to exceed the fuel-specific MER, for each hour of the missing data period.
	(3) For a unit with add-on NO_x emission controls (e.g., steam/water injection or selective catalytic reduction), verify that the DAHS substitutes the fuel-specific NO_x MER for each operating hour in which proper operation of the add-on controls is not verified.