

Strategies for Certifying Continuous Compliance with Opacity Standards

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Introduction

- Electric power companies must annually certify whether each of their emission units are in continuous or intermittent compliance with all applicable air pollution regulations including opacity standards.

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- With continuous opacity monitoring conducted in all electric generating units of 25 MW or more, exceedances of the typical 6-minute opacity standard will sometimes occur.

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- The **purpose** of this presentation is to discuss strategies for certifying continuous compliance with opacity standards given the random infrequent exceedances of the 6-minute opacity standards that often occur.

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- Many states use “**Discretionary Enforcement Authority**” as the way to address this issue- - it is at the discretion of the state air pollution agency enforcement authority on a case by case basis whether to designate one or more exceedances of the opacity standard as a violation

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- Another approach to accomplishing this is to try and **change state regulations and enforcement policies** so that a certain number or percent of opacity exceedances are allowed for all electric utility units statewide before a violation occurs.

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North Carolina is the one state we know that has done this and had it approved by U.S. EPA

NC Rule 2D.0521 allows an EGU to have four exceedances of the 6-minute opacity standard of 40% per day as long as these exceedances do not exceed 0.8% of total operating hours per year

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Under **NC 2D.535**, startups, shutdowns and malfunctions may be excluded in determining the exceedance frequency

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- A third approach is to propose and have the state adopt a Title V permit condition that allows exceedance of the opacity standard a certain percent of time each quarter.

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- The preamble to the amended EPA compliance certification regulation allows an electric power company Responsible Official to certify continuous compliance if the actual opacity exceedance percentage does not exceed an **allowed opacity exceedance frequency** in the Title V Permit.

Introduction

Federal Register, Vol.68, No.124, June 27,
2003, page 38520

How to Determine an Allowed Opacity Exceedance Frequency

Suggest the Allowed Opacity Exceedance Frequency for each electric generating unit (EGU) should be the exceedance frequency per calendar quarter occurring under Best Work Practices and proper equipment operating conditions that are consistent with past operation since continuous opacity monitoring began.

How to Determine an Allowed Opacity Exceedance Frequency

With this approach, there will be no “Backsliding” in terms of EGU emissions.

How to Determine an Allowed Opacity Exceedance Frequency

What statistical measure of the Allowed Opacity Exceedance Frequency should be proposed in the Title V Permit?

How to Determine an Allowed Opacity Exceedance Frequency

Should the average or median Exceedance Frequency per quarter be used?

Problem: Will violate this exceedance frequency about half the of the calendar quarters

How to Determine an Allowed Opacity Exceedance Frequency

Should a “high” percentile (e.g.) of the Exceedance Frequency per quarter be used?

Example. Exceedance Frequency not exceeded more than 10% of all calendar quarters

How to Determine an Allowed Opacity Exceedance Frequency

Problem: How do you determine what percentile to use per quarter and be able to certify Continuous Compliance for the large majority of future years?

How to Determine an Allowed Opacity Exceedance Frequency

Apply Monte Carlo simulation to the time series of number of opacity exceedances per quarter for 5 or more years.

How to Determine an Allowed Opacity Exceedance Frequency

Simulate the number of exceedances and probability of certifying continuous compliance with the opacity standard in *every year over a ten-year period* with various Allowed Opacity Exceedance Frequencies per calendar quarter.

How to Determine an Allowed Opacity Exceedance Frequency

Make a management decision on what probability of certifying continuous compliance with the opacity standard in *every year over a ten-year period* is acceptable.

How to Determine an Allowed Opacity Exceedance Frequency

Select as the Allowed Opacity Exceedance Frequency the one determined in the Monte Carlo simulation that corresponds to the acceptable probability of compliance certification decided by management

Example of Results of Monte Carlo Simulation to Determine an Acceptable Opacity Exceedance Frequency

Percentile	Number exceedances of 6-minute opacity standard over 10 years in excess of 2% of the 6-minute periods per quarter
0%	0.02
10%	0.03
20%	0.03
30%	0.03
40%	0.04
50%	0.06
60%	0.07
70%	0.09
80%	0.14
90%	1.2
100%	7.4