

Strategies for Certifying Continuous Compliance with Opacity Standards

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Introduction

- Electric power companies and other 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.

Introduction

- 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.

Introduction

- 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.

Introduction

- U.S. EPA has issued guidance to state air pollution control agencies to identify High Priority Violations (HPVs) that are candidates for enforcement actions.
- Table 2 from my paper summarizes the conditions for an HPV in the case of continuous opacity monitoring.

Table 2. U.S. EPA Policy on High Priority Violations (HPV) for Exceedances of Applicable Opacity Standards

Violation	Method of Detection	Standard Averaging Time	% of Operating Time in Excess of Standard per Reporting Period	Amount in Excess of Standard
Violation of applicable opacity standard	Continuous Opacity Monitoring (COMS)	0-20% opacity	>5%	>5% opacity
			>3% to 5% for two consecutive reporting periods	
		>20%_opacity	>5%	>10% opacity
			>3% to 5% for two consecutive reporting periods	

Introduction

- 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

Introduction

- 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.

Introduction

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

Introduction

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

Introduction

- U.S. EPA determined that this new rule did not constitute **Backsliding** and was approved.

Introduction

- Other states have had difficulty getting revised opacity rules approved to address exceedance issues because U.S. EPA deemed they represented Backsliding.

Introduction

- This paper focuses on a third approach:

For each permit, adopt a Title V permit condition that allows exceedance of the opacity standard a certain percent of time each quarter.

Introduction

- 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

Introduction

Basic Idea: Set the Allowed Exceedance Frequency to the exceedance frequency per calendar quarter occurring under Best Work Practices and proper equipment operating conditions consistent with past operations.

Introduction

With this approach, there will be no “Backsliding” that U.S. EPA has objected to.

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

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

How to Determine an Allowed Opacity Exceedance Frequency

Simulate 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

Results of Simulation:

Fraction of future 10-year periods when Electric Generating Unit must certify Intermittent Compliance in one or more years

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

This management decision will determine the Allowed Opacity Exceedance Frequency per calendar quarter to propose be included in the Title V Permit

Conclusions

- Random opacity exceedances occur even under proper operating conditions
- With the Title V permit allowing a specified opacity exceedance frequency per quarter, it will be possible to certify Continuous Compliance.

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