



75TH AIR BASE WING



DOCS II as “ACE” in Lieu of an ASTM Standard for Digital Cameras

2009 Environment, Energy and Sustainability Symposium and Exhibition

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Agenda



- > What is DOCS II?
- > What Data Supports the Any Credible Evidence (ACE aka CE) Claim?
- > Pertinent CE-related Points
- > DOCS II as CE
- > The ASTM Standard for Digital Cameras

What is DOCS II?



- > DoD recognized the costs and subjectivity of Method 9 monitoring, and the need for development of an alternative means of measuring visible opacity.
- > The DOCS II technology rapidly characterizes emissions using:
 - Commercial-Off-The-Shelf digital camera
 - Standard computer
 - Emission characterization software

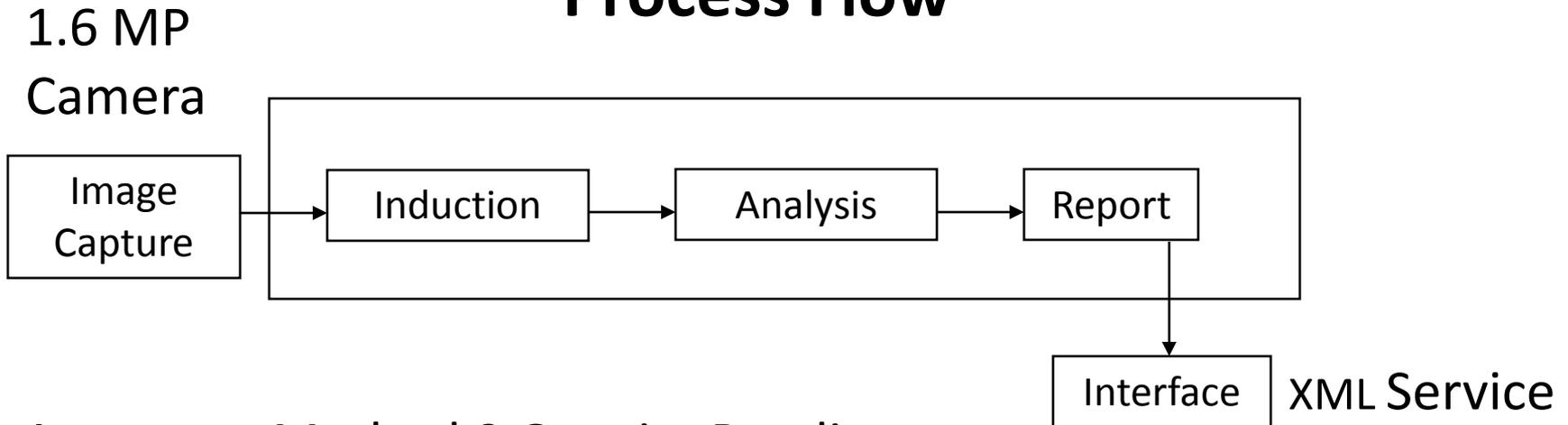


Characterization of Emissions to Reduce Compliance Burden, While Sustaining Our Mission Infrastructure

What is DOCS II?



Process Flow



- > Automate Method 9 Opacity Readings
- > Remove Subjectivity of Method 9 Readings
- > Provides Easily Retrievable Archive

Fast, Easy, Reliable, Repeatable, Characterization of Fugitive Emissions to Reduce Compliance Burdon

What Data Supports CE Claim ?



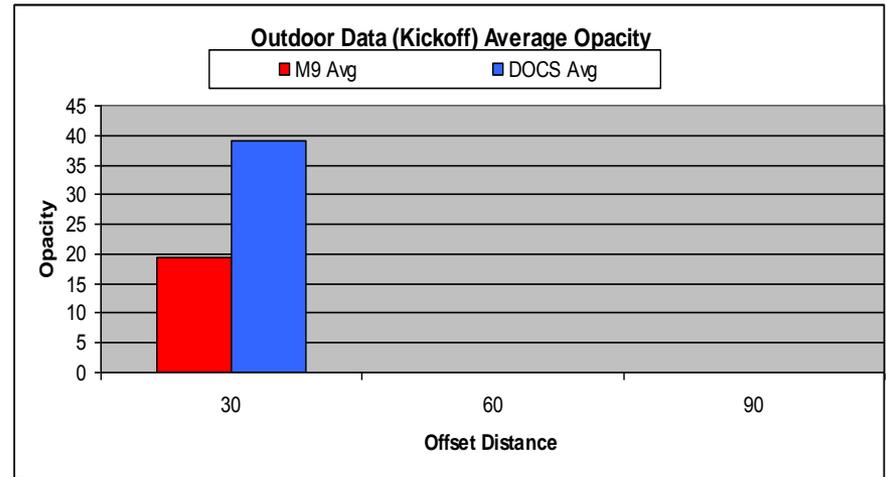
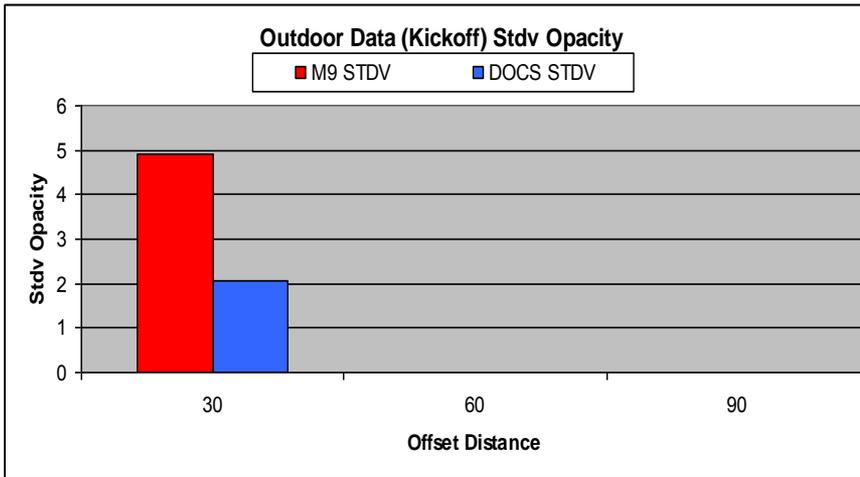
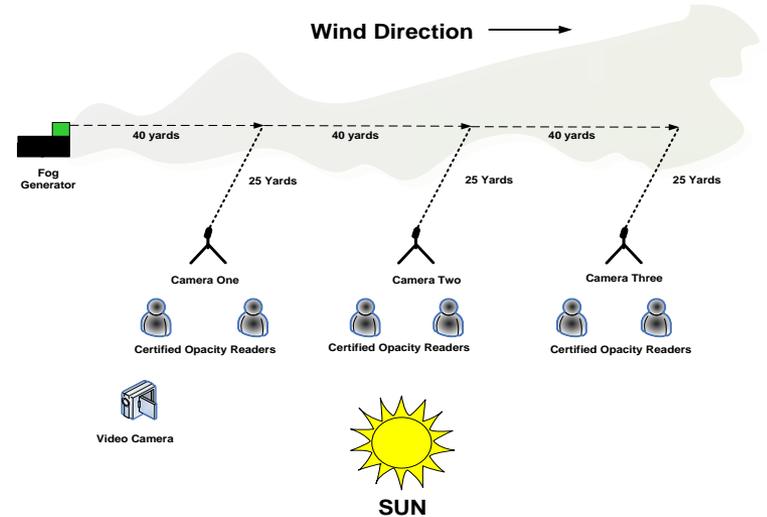
- > Over numerous trials, DOCS II has been compared to human readers.
- > Over numerous and ongoing trials DOCS II has been compared to the transmissometer under “Smoke School” conditions...the human certification method.

Hill AFB Outdoor Analysis



> Issues with experimental design:

- Inability to correlate M9 with DOCS II readings
 - > Where was the M9 reading taken?
 - > Relative to where DOCS reading taken?
 - > What was the right answer?
- Wind blew smoke beyond targets at 60, 90, ft no opacity recorded
- Inability to establish limits of light or wind

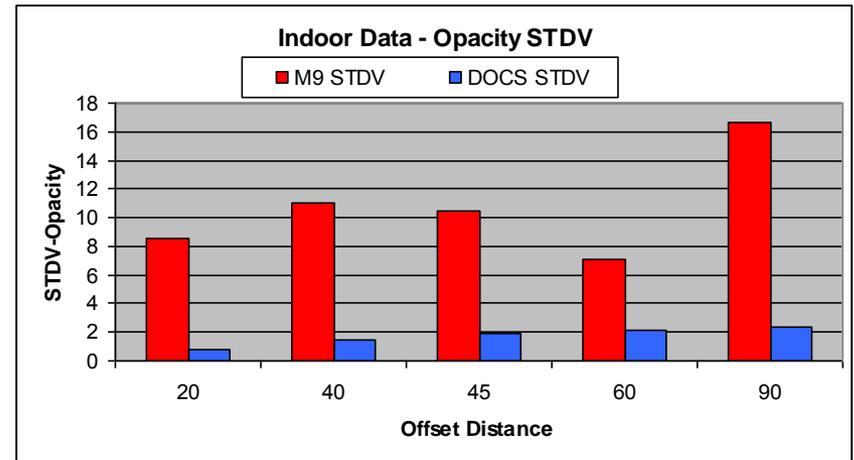
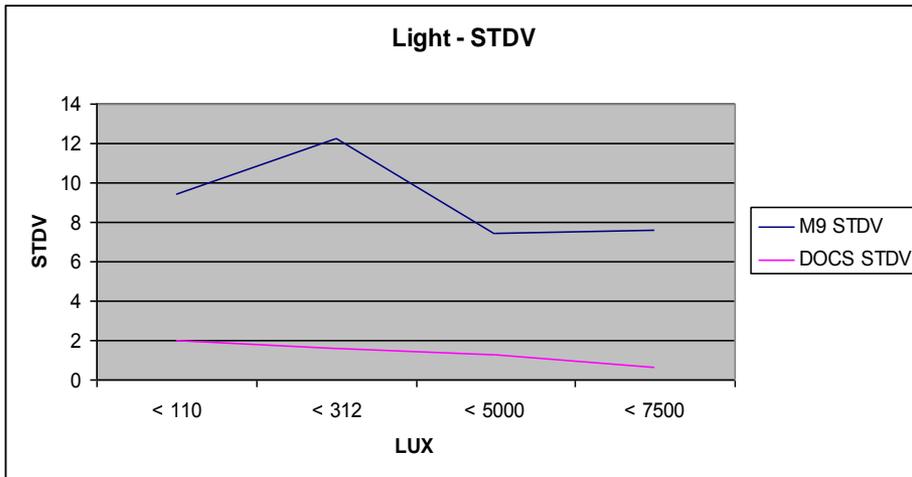
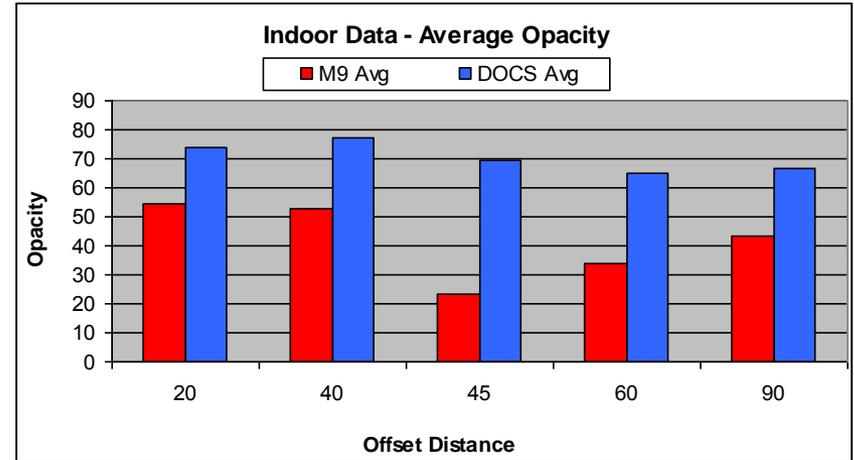


...Back to the Drawing Board

Hill AFB Indoor Analysis



- > Light limit >200 LUX
- > Wind limit between 0 and 15 mph
- > Still no authoritative source of opacity
- > Still inability to correlate M9 and DOCS II

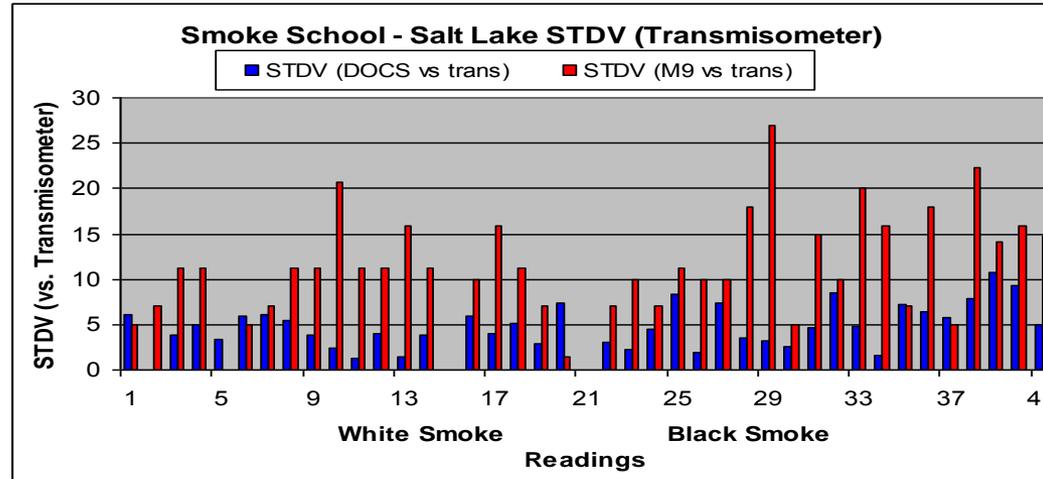
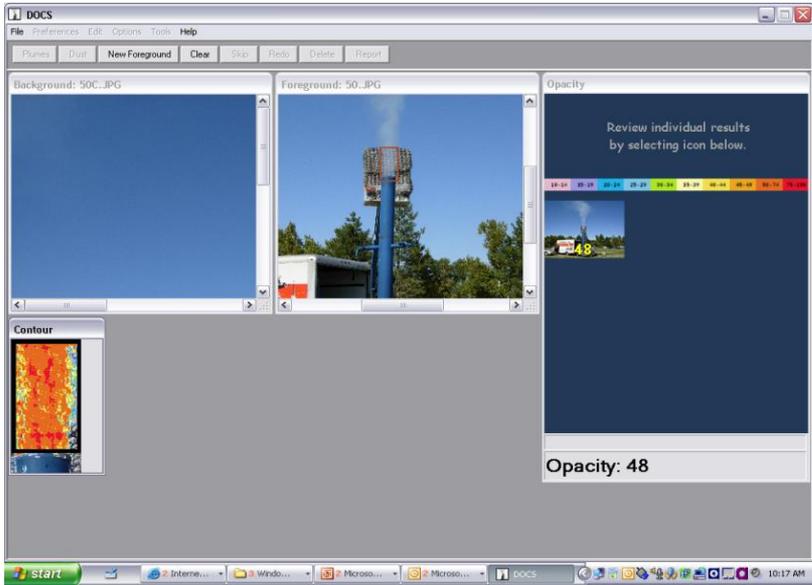
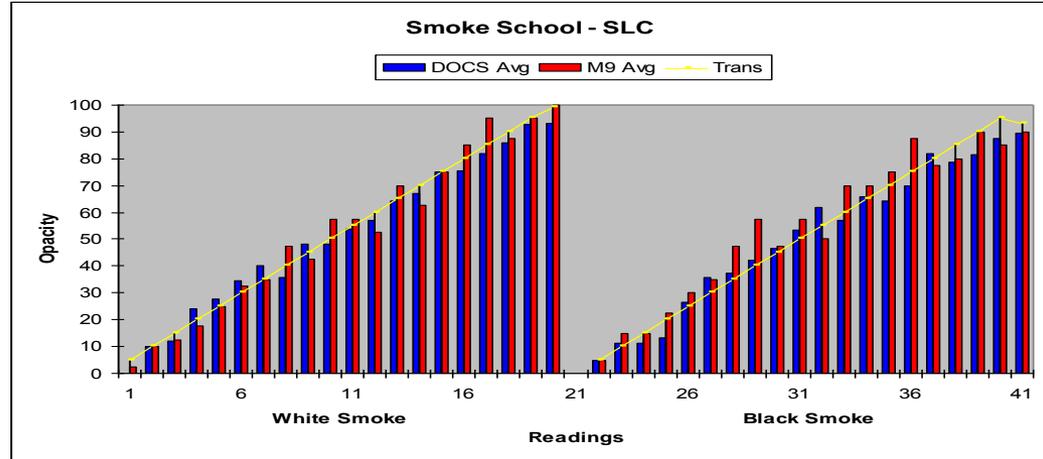


Defined Light and Wind Limits

Smoke School Hill AFB Test



- > DOCS compared to M9 against transmissometer
- > Authoritative source of opacity...accuracy established
- > Method 9 certification distance
 - 45 ft from source
- > Used camouflage to simulate background

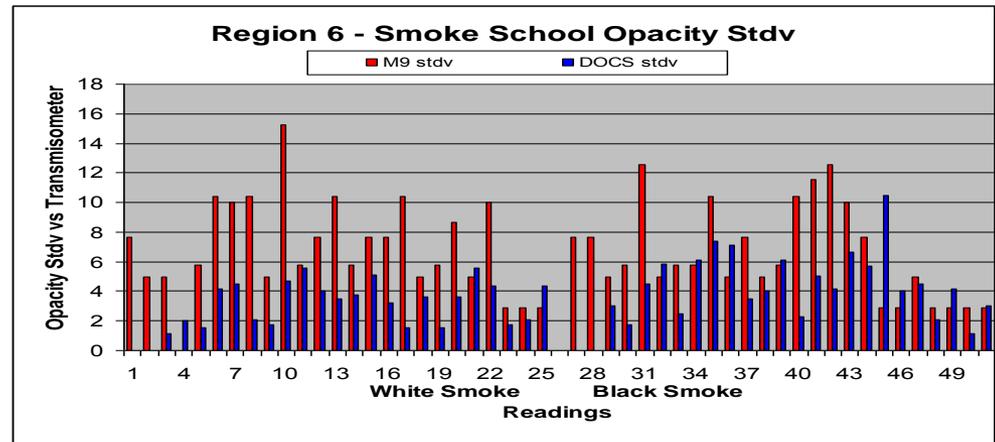
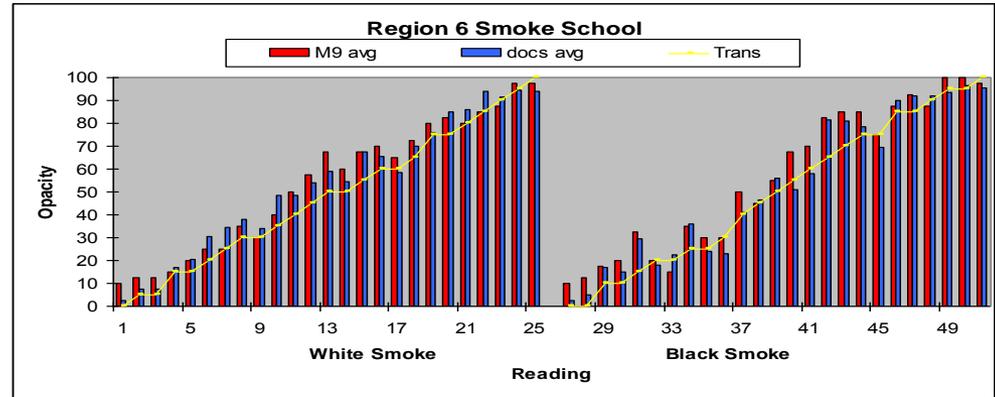


Validated Demonstration Design - DOCS Accuracy

Smoke School Region 6



- > DOCS compared to known transmissometer
 - 45 and 90 ft
 - Multiple DOCS II participants
 - Better precision
- > TCEQ present
 - Helped Ft Hood propose how they would use DOCS II in Title V to include DOCS II implementation training

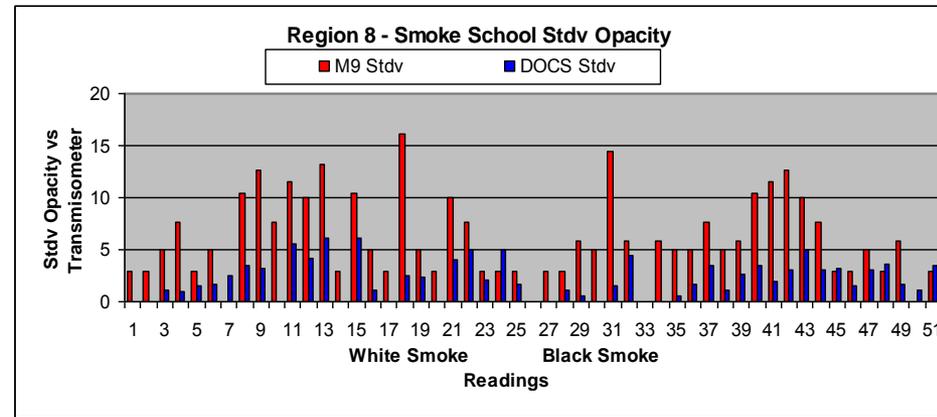
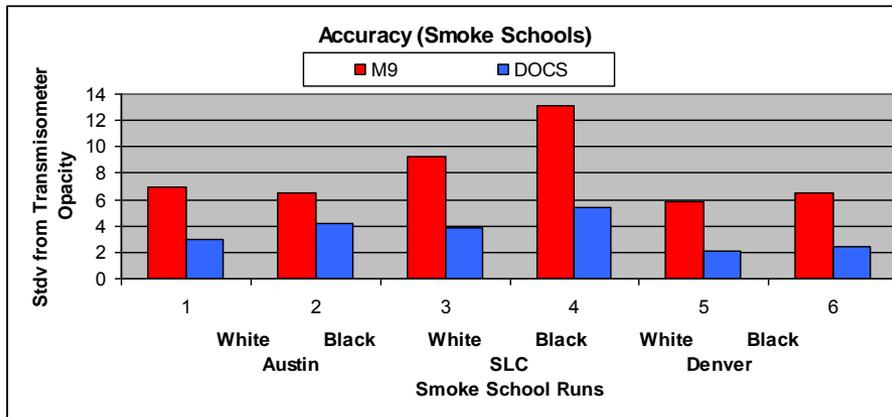
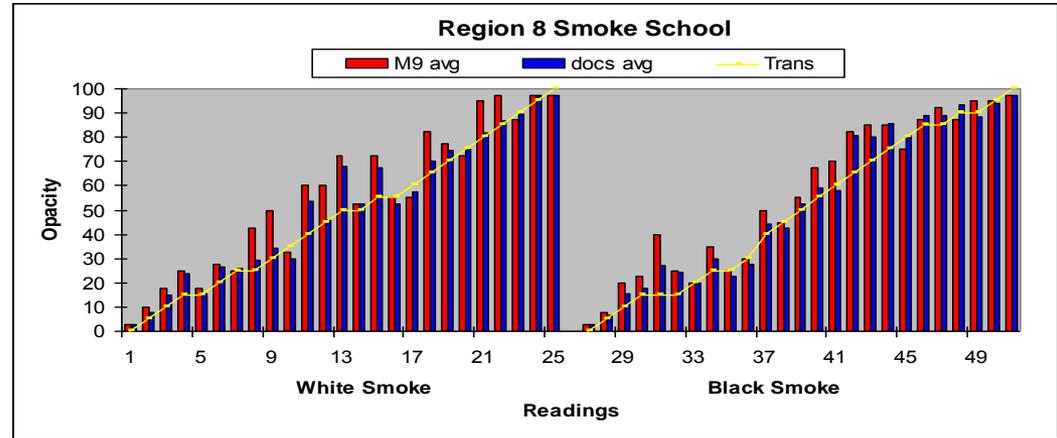


DOCS II Precision Validated

Smoke School Region 8



- > Compare DOCS to Method 9 with a known opacity source
 - DOCS II accuracy better
 - DOCS II precision better
- > Data gathering at smoke schools continues



DOCS Performing as Well as Certified Human Observer



> CAA 1990 Amendments

- **Section 103(a)** An enforcement action may be based on “any information available”
- **Section 113(e)(1)** (Penalty calculation) the duration of a violation is established by “any credible evidence”, including evidence other than that in the applicable test method.
- 1993 rule drafted, and challenged.
- Final rule promulgated in 1997.

...CE Prevails

Pertinent CE Points



Reference Test Benchmark

<http://www.epa.gov/EPA-AIR/1997/February/Day-24/a4196.htm>

- > ...although the regulation is being modified to clarify that it does not establish an exclusive method of determining compliance, the reference tests remain the benchmark against which other emissions or parametric data, engineering analyses, or other information will be evaluated.
- > ...evidence or information gathered by other means than the reference tests (must) be relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

What DOCS Determines, a Method 9 Reader Should Conclude

Pertinent CE Points



Not just for Citizens' Actions

<http://www.epa.gov/EPA-AIR/1997/February/Day-24/a4196.htm>

This will help ensure that the government and citizens alike can respond to sources that are not complying with air pollutant emission standards on an ongoing basis, thus furthering the protection of public health and the environment. At the same time, sources will be able to use credible evidence for contesting allegations of noncompliance in enforcement actions. Accordingly, today's rulemaking exemplifies EPA's "common sense" approach to environmental protection, which encourages **smarter, cheaper, and more flexible means** of achieving environmental goals without compromising the fundamental health and environmental protections provided by federal environmental laws.

Sources Can Use CE to Verify "In Compliance"....

Pertinent CE Points



Not just for Citizens' Actions

- > EPA presumption re: part 64 – A device that operates within indicator ranges is presumed to be in compliance with emissions standards;
- > Excursion(s) from indicator ranges does not prove noncompliance, **source owner may use other information to augment certification** (for any certification elements, not just for part 64 data).

Sources Can Use CE to Verify "In Compliance"....

DOCS II as CE



Today

- > Data shows DOCS II to be at least equivalent to certified observer in the observer's certification environment (smoke school)
- > Method 9 is the benchmark, and DOCS II is identical to the benchmark in terms of its protocols and data requirements...not a stretch for CE claim
- > Meets the EPA's goals (smarter, cheaper, and more flexible...)
- > * New NSPS for industrial-commercial-institutional steam generating units

DOCS II Is Effectively the Same as the Benchmark....

Regulatory Reference

- > Effective 28 Jan 09 EPA is amending the NSPS for industrial-commercial-institutional steam generating units.
- > If the maximum 6-minute opacity is less than 10 percent during the most recent Method 9 of appendix A-4 of this part performance test, the owner or operator may, as an alternative to performing subsequent Method 9 ... elect to perform subsequent monitoring using a **digital opacity compliance system** according to a site-specific monitoring plan approved by the Administrator.



The Future Looks Bright

- > Basically equivalent to Method 9, replaces the human observer with digital still camera
- > Made it through workgroup review, through D-22 Committee review
- > 3 dissenters
- > Dissenters' comments to be addressed in Vancouver ASTM meeting in April 2009
- > ETA of ASTM standard is less than 1 yr.

The Future....



- Spatial Data
- Met Data
- Opacity Data





Summary

- > If DOCS II Meets the same certification requirement as a human...
- > If DOCS II has a cheaper lifecycle cost...
- > If DOCS II makes it easier to maintain an archive...
- > If the regulations clearly indicate CE is for Sources too...
- > If there is precedent that the regulatory community sees Digital methods as a viable monitoring method...
- > If the ASTM standard allowing its use is immanent...

Who Wants to Try It?

Questions





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