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# Air Quality's "Hottest" Topic - Startup, Shutdown, Malfunction Emissions

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Wes Younger



# Hot Topic! Startup, Shutdown, Malfunction (SSM)

- > Historically, many State Implementation Plans (SIPs) used by states to implement Federal air pollution rules have included blanket provisions allowing varying kinds of automatic forgiveness for violations of many emission standards during periods in which the associated equipment was in the process of a Startup, Shutdown, or Malfunction (SSM)

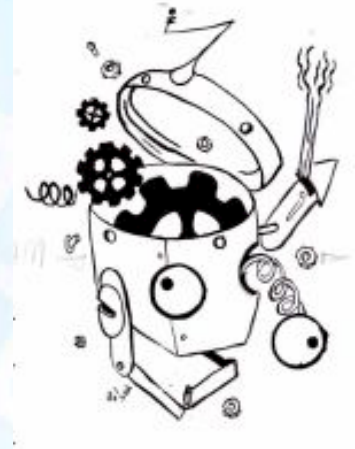
# Intro to SSM

- > Meaning of “startup” and “shutdown” here are as you would expect, but keep in mind that “shutdown” only includes planned shutdowns



# Malfunction...

- > Means a sudden and unavoidable breakdown of process or control equipment- or failure of the process to behave as expected
  - ❖ May occur during startup, shutdown, or normal operation
- > Not reasonably foreseeable and not considered during rule development
- > Oxidizer breakdown, sudden catalyst fouling, torn filters, fire.



# Intro to SSM

- > Over time, EPA has gradually reduced the breadth of these exemptions and limited when they can be used
- > A 2011 *Sierra Club* petition to EPA pointed out that the SSM provisions of the SIPs of 39 states were inconsistent with the wording of the CAA and were impermissible, particularly when treating planned events the same as unplanned events like malfunctions

# Sierra Club Petition

- > EPA largely agreed
- > EPA proposed in February 2013 to require 36 states to amend or remove from their SIPs provisions that allow for automatic forgiveness of emissions exceedances during periods of startup or shutdown
- > Malfunction provisions would be allowed to remain

# Feb. 2013 EPA Proposal- Affected States

X	Alaska	Grant
	Idaho	Deny
	Oregon	Deny
	Washington	Grant

VIII	Colorado	Partial Grant/Deny
	Montana	Grant
	North Dakota	Grant
	South Dakota	Grant
	Wyoming	Grant
	Utah	No Action

I	Maine	Grant
	New Hampshire	Partial Grant/Deny
	Rhode Island	Grant
	Vermont	No Action
	Massachusetts	No Action
	Connecticut	No Action

II	New Jersey	Partial Grant/Deny
	New York	No Action
	Puerto Rico	No Action
	US Virgin Islands	No Action

V	Illinois	Grant
	Indiana	Grant
	Michigan	Grant
	Minnesota	Grant
	Ohio	Partial Grant/Deny
	Wisconsin	No Action

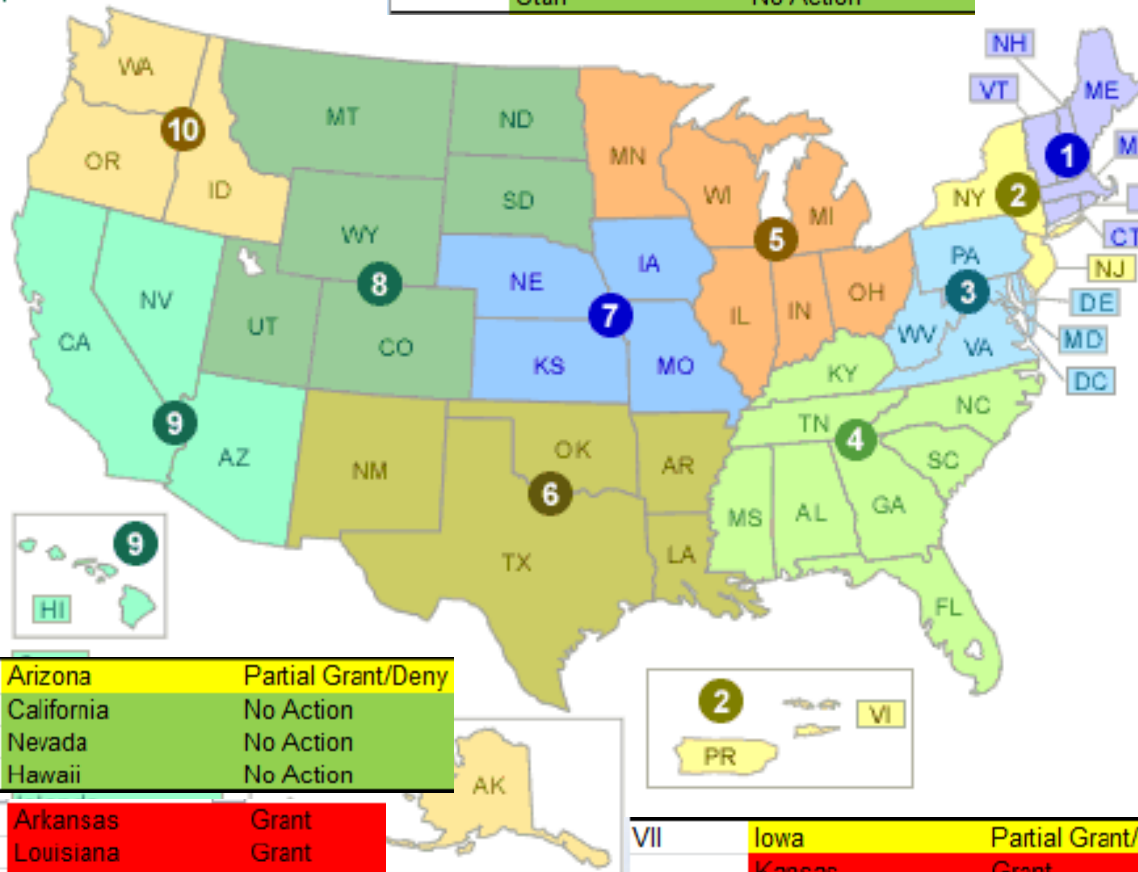
III	Delaware	Grant
	District of Columbia	Partial Grant/Deny
	Virginia	Grant
	West Virginia	Grant
	Maryland	No Action
	Pennsylvania	No Action

IV	Alabama	Grant
	Florida	Grant
	Georgia	Grant
	Kentucky	Grant
	Mississippi	Grant
	North Carolina	Grant
	South Carolina	Partial Grant/Deny
	Tennessee	Grant

IX	Arizona	Partial Grant/Deny
	California	No Action
	Nevada	No Action
	Hawaii	No Action

VI	Arkansas	Grant
	Louisiana	Grant
	New Mexico	Grant
	Oklahoma	Grant
	Texas	No Action

VII	Iowa	Partial Grant/Deny
	Kansas	Grant
	Missouri	Partial Grant/Deny
	Nebraska	Deny



# April 2014 - Portland Cement Court Case

- > Natural Resources Defense Council v. EPA & Cemex, decided April 18, 2014
- > Court ruled that EPA did not have the authority to allow for special treatment of malfunction events with excess emissions for NESHAP standards that control hazardous air pollutants (aka MACT standards, such as Subpart DDDD)



# Sept. 2014 - Supplemental Proposal



- > Per the court decision, EPA proposes to apply these changes to malfunctions as well
- > This only affects 17 of the 36 states

# May 2015 - Final Action

## > Final action:

- ❖ Responds to 2011 Sierra Club Petition
- ❖ Clarifies the EPA's SSM Policy
- ❖ Finalizes the Administrator's findings that the SSM provisions in the SIPs of 36 states do not meet the requirements of the CAA
- ❖ Requires the 36 to submit for changes to their SIPs within 18 months (by 11/22/16)

# What Does This Mean To Me?

- > State air pollution control regulations are in the process of being revised in the 36 states
- > Almost all emission standards will be considered to apply at all times, regardless of any SSM condition

# What Does This Mean To Me?

- > Exceeding emission limits during SSM is mostly of concern for:
  - ❖ Sources subject to short-term emission standards (1-hour, 3-hour, etc.)
  - ❖ Sources that take a long time to start up or shut down
  - ❖ Sources whose emissions are very different during SSM than during normal operations (emission control devices coming up to temperature, etc.)

# What Does This Mean To Me?

- > It is allowable for an emission control rule to provide a different emission limit for SSM than for normal operation
- > Very few standards were written this way!

# What Does This Mean To Me?



- > Look through the emission limits that apply to your facility and exactly how compliance is demonstrated
- > Think through whether you can meet them during your normal startup and shutdown routines. What about during malfunctions?

# What Does This Mean To Me?

- > Do you have a continuous emission monitoring system (CEMS) or opacity monitor (COMS) that will definitely detect the excess emissions?
  - ❖ What is the averaging interval for that data?
  - ❖ If it's easier to improve on steady-state emissions than SSM emissions, see if steady-state improvements might be enough to fix the averaging period that would include the SSM event

# Avoiding SSM Trouble

- > Rethink startup and shutdown procedures. What is the exact mechanism that causes the excess emission?
  - ❖ Would emissions be better if startup or shutdown were done faster or slower?
  - ❖ Would the above make no difference in overall emissions but help the averaging for the emissions standard work out better?
  - ❖ Would it help if the dryer, press, etc. was started up or shut down earlier or later relative to other equipment?



# Avoiding SSM Trouble

- > Rethink startup and shutdown procedures. What is the exact mechanism that causes the excess emission?
  - ❖ If thermal warmup of certain areas (or emission controls) at startup is a problem and it can't be addressed by tweaking the startup sequence, it may be necessary to install an auxiliary heater for startup
  - ❖ Consider increasing avoidance of startup and shutdown entirely

# Avoiding SSM Trouble



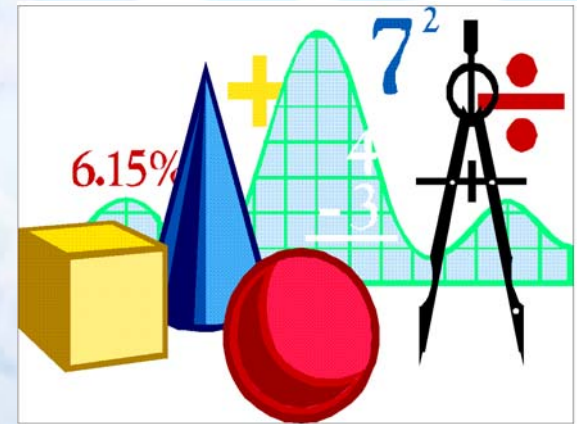
- > Think about how malfunctions are handled when these events occur
  - ❖ List out known ways for the process or process equipment to malfunction- especially common ones
  - ❖ Try to predict which malfunctions would cause an emission problem
  - ❖ Look through plant design and malfunction handling procedures. Is there a procedural change that could reduce the emissions? Look across the board, but also look for cases needing special handling.

# Avoiding SSM Trouble



- > PREVENT malfunctions from occurring
  - ❖ Using the same list, think about ways to prevent the malfunction, or preventing it from happening in a way that causes excess emissions
  - ❖ The newfound risk of a fine for excess emissions during malfunction may be good incentive for increased focus and spending on maintenance and employee training

# Avoiding SSM Trouble

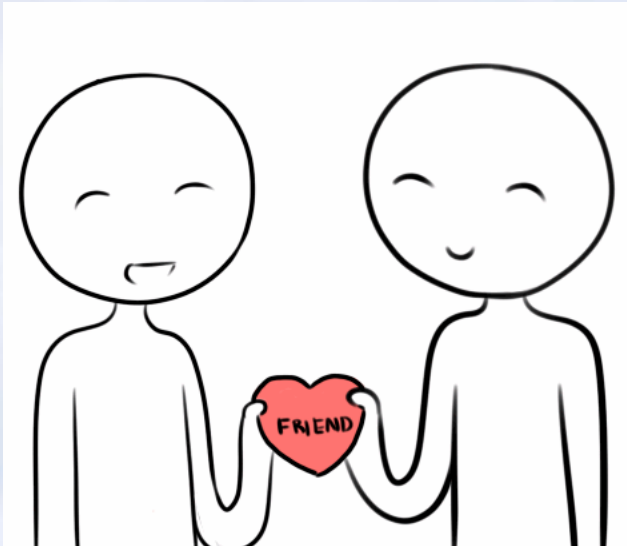


## > Magnitude of Excess Emissions

- ❖ While the rules may not include an automatic forgiveness anymore, compliance officials will continue to have discretion to decide what events merit enforcement action
- ❖ When they evaluate excess emission events, the magnitude of the event typically is considered.
- ❖ How will you quantify when asked?

# Avoiding SSM Trouble

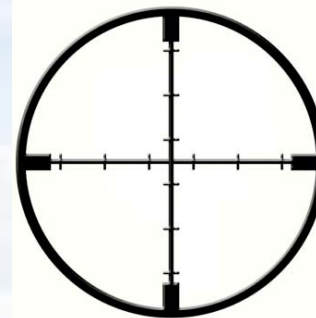
> Your compliance inspector is now your best friend



- ❖ There may be some value in saving up some “points” in their eyes by over complying in most regards- you may need those points later
- ❖ Don’t expect quite the same treatment if they see your facility as a “doing the bare minimum” type operation

# Avoiding SSM Trouble

- > Your compliance inspector is now your best friend
  - ❖ But remember that Title V permits and Federal standards can be enforced by any of three parties: the state, EPA, and any interested citizen
  - ❖ After doing your best on emissions, don't fail to put great thought and care into compliance reporting.
  - ❖ How long is your list of enemies, and how big of a target are you to them?



# Questions?

Thank you.

Wes Younger, Managing Consultant

Trinity Consultants - Atlanta, GA

(678)441-9977, ext. 255

[wyounger@trinityconsultants.com](mailto:wyounger@trinityconsultants.com)

<http://www.trinityconsultants.com>