The 3 N’s of Air

Basic Concepts of NSPS, NESHAPs and NSR

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Basic Concepts of NSPS, NESHAPs and NSR

- Objective: provide a framework for how to think about these regulations
- Emphasis is on applicability and major requirements
- This will not make you an expert
- These rules are subject to interpretation
- Get to know the resources in your company for interpretation guidance
- Let’s presume you are an environmental staffer at a major stationary source. How do you evaluate a change that you must approve?
Basic Concepts of NSPS

• NSPS – New Source Performance Standards
  – Authorized in the 1970 Clean Air Act Amendments
  – Sets control technology standards for emission units that emit criteria pollutants
  – Tip: It doesn’t just regulate new sources – regulates new sources AND “existing facilities” that become “affected facilities” via “reconstruction” or “modification”
  – Tip: A new standard does not have to be final for it to apply to a change, it only has to be proposed.
  – Structure: 40 CFR Part 60
    • Subpart A – General Provisions – recordkeeping, reporting, definitions, some control requirements (i.e. flares)
    • Subpart B – SIP requirements for states
    • Subparts C and on – requirements for specific types of emission units
Basic Concepts of NSPS, cont’d

• So what makes an emissions unit subject to NSPS?
  – You build a new facility, or reconstruct, or modify an existing facility such that it becomes an affected facility
    • Tip: watch for exemptions based on size, vapor pressure, etc.
    • Tip: watch for overlap provisions with NESHAPs
    • Tip: watch for changes in what is considered an existing facility as the NSPSs are updated
  – You build a brand-new facility regulated by the Subpart
  – You trigger “reconstruction” – see 40 CFR 60.15
    • Your replace components on an existing facility, and the work costs more than 50% of the cost of constructing a comparable entirely new facility (today’s dollars)
    • Common example: Kb reconstruction trigger on an existing hydrocarbon storage tank
    • Tip: some Subparts have specific provisions that define “reconstruction” differently
You trigger “modification” – see 40 CFR 60.14

- You increase production rate; it increases the emission rate to the atmosphere and it is a capital expenditure
- Emission rate to the atmosphere – short term emissions, not tons per year
- Is it a capital expenditure? Does the cost exceed the following formula? (see definitions in 40 CFR 60.2)

\[ \text{Trigger} = \text{Annual asset guideline repair percentage} \times \text{the existing facilities cost basis} \]

The annual asset guideline is an IRS figure that states the typical % expenditure in a given year for a given source category – i.e. for SOCMI – 12%, for Petroleum Refineries - 7%, for Pulp and Paper – 10%

The existing facilities cost basis is the capital dollars it cost to build the facility originally, and the added capital over the years.

Tip: this is historical cost, not today’s dollars!
Basic Concepts of NSPS, cont’d

• The project will trigger NSPS, now what?
  – In Louisiana, you will need some type of permit action
    • Request for a reconstruction - LAC 33:III:501.C.1
    • If it is a new or modified facility, it is a Title I modification
      – Minimum of 2 months for EPA and public notice
      – See LAC 33:III:502 definition
    • For emergency engines, can use a Regulatory Permit
      – Ensure the project installer puts in the correct emission control requirements
      – Specific notifications for startup, performance test, etc.
      – Monitoring, recordkeeping and reporting
Basic Concepts of NESHAPs

• You completed the NSPS evaluation for the change, are you finished?
  No, there is lots more to do!

• Evaluate the change for NESHAPs – National Emission Standards for Hazardous Air Pollutants (aka MACT)

• Background
  – Authorized by 1990 Clean Air Act Amendments
  – Structure: 40 CFR Part 61 or Part 63
    • Part 61 is by pollutant: vinyl chloride, benzene
    • Part 63 is by source category: Ethylene plants, Petroleum Refineries (I and II), Pulp and Paper, Polymers and Resins, HON (Hazardous Org. NESHAPs), MON (Misc. Org. NESHAPs)

• Requirements
  – Requires MACT (Maximum Achievable Control Technology) for source categories that emit HAPs (Hazardous Air Pollutants) (a few are by pollutant)
  – For existing sources, plants were given 3 years to meet the standards. Different than NSPS for existing sources, which must trigger reconstruction or modification to be subject.
  – So, your facility should already be in compliance with the applicable NESHAPs. Notable exception is Combustion MACT which continues to be debated.
  – But, a change may trigger MACT applicability when it did not apply before, or it may impact the compliance method.
Basic Concepts of NSR

• Not done yet!
• New Source Review
  – Current version of regulations effective in 1980
  – Regulates construction of new and modified emission units at major stationary sources (just like NSPS – don’t let the name fool you!)
  – Complex regulation that has led to multiple court cases, enforcement actions and consent decrees
  – Codified in CFRs, but most of your reference information will come from the state rules, state permit procedures manual, EPA opinions on similar situations, and training classes
  – You must know the resource for guidance within your company and ensure you follow your company’s policies
  – Tip: some times you will hear a comment “the project does not need a permit” when what is meant is that major NSR is not required, but the project still requires a minor NSR permit before construction.
Basic Concepts of NSR – cont’d

- What triggers the need for an NSR permit?
  - A permit is required for a “physical modification or change in the method of operation that increases emissions”
  - Note that NSR regulates annual tons per year emissions vs. NSPS modifications which address peak hourly emissions.
  - Seems pretty straightforward but it’s not
    - Some of the non-environmental folks you deal with will call it illogical

- The biggest “you gotta be kidding” moment you will have as you work with project staff: a pre-construction permit is needed if you are increasing emissions on a given source even if you don’t need to increase the permit limit

- Example:
  - A unit has a process heater permitted for 100 MBTU/hr capacity. But the heater can only produce 85 MBTU/hr. A project is proposed to add additional burners and increase the capacity to 90 MBTU/hr. After the project, actual emissions will increase, since the heat duty is the current limit on the process unit.
  - Does this project require a pre-construction permit? Yes.
Important Concepts

- Major Stationary Source – building, structure, facility or installation that emits a regulated pollutant above a stated threshold.
  - Threshold is either 100 or 250 tons per year in attainment areas.
  - Includes all operations that are 1) adjacent or contiguous, 2) under common control and 3) under the same SIC code
  - Also includes support facilities
- What triggers the need for an NSR analysis? A “Physical Modification or Change in the Method of Operation”

Exemptions

- Routine Maintenance, Replacement and Repair – use “Detroit Edison” factors if necessary – nature, extent, purpose, frequency, cost
- Increase in hours of operation
- Change in fuel or raw material
- For a non-exempt change:
  - Is there an actual emissions increase?
  - Will actual emissions be higher than the highest 24 consecutive months in the last 10 years?
  - If yes to both, the project is subject to NSR.
You decide a project is subject to NSR. Now you need to calculate the emissions increase.

Sample project: increase capacity of a distillation tower.
- Add burners to the existing process heater
- New piping to bring in another feedstock
- Retray the tower
- Need more steam for the extra production (but no physical change to the boiler)

Emissions increase
- Furnace: increase is future potential/permitted emissions less highest 24 consecutive months actual emissions – “Actual-to-potential” – or can use reform
- New piping: new sources: pumps, valves, connectors, etc.
- More steam: change caused by the production increase – based on anticipated increased steam demand – “Actual-to-actual”
- Add all these up = Emissions increase
Basic Concepts of NSR – cont’d

- Presume this project will happen in an attainment area. Compare the emission increase to the PSD trigger – Prevention of Significant Deterioration.

<table>
<thead>
<tr>
<th>Pollutant (tpy)</th>
<th>NOx</th>
<th>SO₂</th>
<th>CO</th>
<th>VOC</th>
<th>PM 10/2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Emissions Increase</td>
<td>45</td>
<td>6</td>
<td>110</td>
<td>5</td>
<td>5/3</td>
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<tr>
<td>PSD threshold</td>
<td>40</td>
<td>40</td>
<td>100</td>
<td>40</td>
<td>15/10</td>
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- So the project is a minor mod for SO₂, VOC and PM. Need to see if we can “net out” for NOx and CO.
- Presume start of construction 2Q13, startup 3Q15. The “contemporaneous period” is 5 years prior to start of construction, through startup. So look at 2Q08 through 3Q15.

<table>
<thead>
<tr>
<th>Pollutant, tpy</th>
<th>NOx</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillation Debottleneck Project</td>
<td>45</td>
<td>110</td>
</tr>
<tr>
<td>Other projects, 2Q08- 3Q15</td>
<td>-35</td>
<td>45</td>
</tr>
<tr>
<td>Net emissions increase</td>
<td>10</td>
<td>155</td>
</tr>
</tbody>
</table>

- So the project is a minor mod for everything except CO.
Since the project is subject to PSD for CO, is it a major modification under NSR.

Will need to do CO modeling since there is a federal ambient air standard. Find an expert.

Will need to a BACT analysis (Best Available Control Technology) – check out the EPA BACT Clearing house.

If any of the emission units triggered NSPS the project is also a significant modification under Title V.

Refer to the DEQ Website for required forms.
Basic Concepts of NSR – cont’d

• Nonattainment NSR (NNSR)
  – What if you are in a non-attainment area?
    • Thresholds are lower
    • You can also “net out”, but note: the contemporaneous period is different than for PSD. It from startup, to the beginning of that year, and then the prior 4 years. So for the Distillation Project, the contemporaneous period is 2011 – 3Q15.
  – NOx is regulated under both programs, if the area is ozone nonattainment
    • For a project with a 45 ton emission increase, you need two different netting analyses.
      • Watch for this as any new ozone standard comes out!
  – If you can’t net out, there is no modeling
  – Will need to offset the emission increase (check, it may be cheaper to net out)
  – May need to do LAER (Lowest Achievable Emission Rate ) or offset at a higher ratio
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Questions / Comments?

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