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Proposed Changes to Amend Regional Haze Program State Planning Requirements

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Proposed revisions to the Regional Haze Rule (RHR) (40 CFR Parts 51 and 52) were published in the Federal Register on May 4, 2016. This proposed rule directly impacts state, local, and tribal governments as well as Federal Land Managers (FLMs) responsible for protection of visibility in Class I areas.1 Indirectly, this rule may potentially affect sources that emit visibility-impairing pollutants, including particulate matter less than or equal to 10 and 2.5 microns in diameter (PM10/PM2.5), sulfur dioxide (SO2), nitrogen oxides (NOx), and volatile organic compounds (VOC).

Defining Haze

Regional haze (RH) is a reduction in visibility caused by the cumulative impact of air pollutant levels in the atmosphere resulting from human activities (“anthropogenic”) and natural events such as wild fires, which can be transported over a wide geographic area. Anthropogenic and natural particles and gases impede the amount of visible light that reaches an observer by scattering and absorbing sunlight as it travels through the atmosphere. This detectable reduction in visible sunlight by an observer is “haze.” Haze is measured in terms of “light extinction” (the amount of light reduced per distance in the atmosphere), and is also expressed in terms of “visual range” (the distance an observer can see an object). Since these two terms are not linear, due to the differences in baseline visibility conditions for any particular scene, the RHR utilizes the haze index in deciviews (dv) designed such that uniform changes in haziness produce similar “perceptible changes” and are constant regardless of the baseline conditions. Pristine skies are classified as having a haze index of zero dv; as the index increases, so does the degradation in visibility.

Regional Haze Rule to Date

The 1977 Amendments to the Clean Air Act (CAA) set a national goal to restore the 156 federally mandated Class I Areas, including national parks and wilderness areas, to pristine conditions by preventing any future, and remedying any existing, man-made visibility impairment, or “regional haze.” Protection of visibility from new sources was established in a 1980 rulemaking where requirements for visibility impairment in terms of “reasonably attributable” impairment and regional haze were addressed.2 Regulations specifically targeting visibility impairment in Class I Areas were finalized in the 1999 Regional Haze Rule.3 These regulations have evolved over the course of the past few decades, as outlined below.

July 1, 1999 – The Environmental Protection Agency (EPA) promulgated the RHR (40 Parts 51 and 52) to address regional haze. The RHR included criteria defining sources that may be subject to Best Available Retrofit Technology (BART) requirements and BART guidelines, i.e., emission controls for industrial facilities emitting air pollutants that reduce visibility by causing or contributing to regional haze. States were also required to establish regional haze State Implementation Plans (SIPs) that must establish goals, the rate of progress, and long-term strategies for attaining natural visibility conditions by 2064.

1 Class I federal areas include national parks (over 6,000 acres), national wilderness areas (over 5,000 acres), and national memorial parks (over 5,000 acres) that were in existence as of August 1977. These areas are granted special air quality protections under Section 162(a) of the federal Clean Air Act.
3 40 CFR Part 51, Subpart P, July 1, 1999 Amendments - Regional Haze Rule. See 64 Federal Register 35713 (July 1, 1999).
State SIPs were due to EPA in 2007 and were required to describe the strategy for achieving reasonable progress goals through 2018.

- **July 6, 2005** – Amendments to the 1999 RHR were finalized. These amendments (often called the BART rule) applied to the provisions of the RHR that require BART emission controls and included definitions for BART applicability criteria and guidance for making source-specific BART determinations.

- **January 15, 2009** – A notice was published in the Federal Register identifying several states that failed to submit SIPs under the 1999 RHR. Only 13 states submitted a complete SIP by the 2007 deadline.

- **2007-Present** – States completed source-specific BART determinations. BART analyses are still being conducted due to the limited disapproval of some states’ SIPs and Federal Implementation Plans (FIPs) finalized in the June 7, 2012 rulemaking (see below).

- **June 7, 2012** – Revisions to RHR and BART rules were finalized. Key highlights are as follows:
  - EPA’s Cross-State Air Pollution Rule (CSAPR) trading programs may be used by participating states in lieu of BART for SO₂ and/or NOₓ emissions from power plants.
  - Limited disapprovals of the regional haze SIPs were finalized for 14 states that previously relied on the Clean Air Interstate Rule (CAIR), which was vacated due to legal challenges, to satisfy BART.
  - FIPs for 12 states were finalized to replace reliance on CAIR with CSAPR in the SIPs.

- **May 4, 2016** – EPA proposed revisions to the RHR for various requirements, including actions that states must take for their regional haze SIP and progress report submittal.

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Proposed Revisions to RHR

In accordance with the RHR, states must develop a long-term strategy to reduce regional haze from all types of anthropogenic sources. A state’s plan must address the following factors: 1) emission reductions due to ongoing air pollution control programs, 2) measures to mitigate the impacts of construction activities, 3) emissions limitations and schedules for compliance to achieve the reasonable progress goal, 4) source retirement and replacement schedules, 5) smoke management techniques, 6) enforceability of emissions limitations and control measures, and 7) the anticipated net effect on visibility due to changes in source emissions.

The May 4, 2016 proposed amendments address requirements for the second planning period (2018 - 2028) with several proposed updates. These updates include, but are not limited to, those listed below.

- Rolling back the due date for SIPs for the second implementation period to July 31, 2021; the end date will remain 2028, meaning SIPs will still focus on measures to achieve reasonable progress by 2028.
- Removing the requirement that progress reports be submitted as SIP revisions, but adding the requirement for states to consult with FLMs and obtain public comment on their progress reports prior to submitting to EPA.
- Changing the due dates for progress reports per state to a fixed schedule. The second and all subsequent progress reports would be due by January 31, 2025; July 31, 2033; and every 10 years thereafter.
- Revising the way in which some days are being selected for purposes of tracking progress towards natural visibility conditions in order to focus on anthropogenic emissions and provide the option to exclude emissions from natural events (e.g., fires).
- Adding the requirement that all states (not just those with Class I areas) develop long-term strategies using the four statutory factors to ensure reasonable progress.

Written comments on the proposed rule changes must be received before July 5, 2016. Public hearings were held in Washington, DC on May 19, 2016, and in Denver on June 1, 2016. Some participants at the May 19th hearing objected to the delayed SIP due date, arguing that faster progress is needed to meet the visibility goal. According to a notice posted on the reginfo.gov website on May 24, 2016, EPA sent draft guidance to the Office of Management and Budget’s (OMB) Office of Information and Regulatory Affairs for states on implementation of the second phase of the RHR. The draft has not been made public but will be released once the OMB review is complete.

For more information, please visit the EPA website: https://www.epa.gov/visibility/proposed-rulemaking-amendments-regulatory-requirements-state-regional-haze-plans. Contact your local Trinity office at (800) 229-6655 for assistance in preparing comments on FIPs and conducting visibility assessments using the CALPUFF Modeling system and/or the Comprehensive Air-quality Model with extensions (CAMx).
How Parallel Processing can Expedite Large AERMOD Model Runs

Due to advances in scientific knowledge, higher resolution raw data, stringent air quality standards, and changing regulations, environmental modeling is demanding more and more from EHS professionals and their computers. All of these influences have resulted in significantly longer AERMOD model run times as compared to the predecessor regulatory model, ISCST. Instead of minutes, AERMOD runtimes for large projects can take days and terrain data file sizes routinely exceed 100 MB. To address the issue of increased runtimes, BREEZE Software offers a number of options to modelers to increase productivity while managing model complexity.

Parallel Processing on the Desktop

To assist with lengthy run times, BREEZE Software completed the complex process of developing parallel software for U.S. EPA’s AERMOD regulatory dispersion model. Utilizing the advancements in multi-core computing technology, BREEZE developed BREEZE AERMOD Parallel, which leverages the multi-core processors available in most modern computers and helps modelers dramatically reduce AERMOD model run times.

A two-core version, which can nearly double the speed of an AERMOD run, is included with every copy of BREEZE AERMOD. BREEZE also offers four- and eight-core versions and can provide additional cores at a custom rate for use with more powerful machines. With this approach, the user can purchase and determine how many processors are desired to run the AERMOD modeling scenario.

High Speed Cluster Computing

For very large AERMOD runs or for highly time-sensitive runs, the BREEZE Remote Modeling System (BRMS) provides the fastest possible results. The BRMS can also be an essential resource when exploring acceptable scenarios for large-scale AERMOD projects. The BRMS operates on a massively parallel computer cluster that harnesses the processing power of multiple multi-core computers. Multi-core computers have more than one processing unit, or CPU, on a computer chip. Each core can be viewed as a separate computer capable of performing independent calculations. By utilizing the BRMS to process the numerically intensive algorithms and data often associated with AERMOD, modelers save time and money.

The BRMS is a Web-enabled application that requires no proprietary software interface, allowing modelers to submit data online anytime (24/7). Users may also submit runs directly through their BREEZE AERMOD interface if preferred. Before submitting a modeling scenario, a user must request a BRMS key. This key protects the confidentiality of all users by allowing a user to view only submissions associated with their key. After receiving the key, users can simply upload input files anytime through our online webpage or directly through their BREEZE AERMOD interface. Email notifications inform users of the model run status and a link to the completed results. Costs and time estimates for each run are based on a number of variables including, but not limited to, the following: number of sources and receptors, type of sources, and output selected.

BREEZE offers a number of other options to assist modelers dealing with large AERMOD projects. Modelers have the ability to schedule multiple model runs sequentially in BREEZE AERMOD, enabling the user to perform runs overnight or while they are away from their computer. Another convenient feature is the Restart option, which is useful in case of a power failure or user interrupt. With the Restart option, intermediate results are saved and the model run can be restarted at the last place it was saved.

To learn more about high speed modeling options, contact the BREEZE Team at breeze@trinityconsultants.com or +1 (972) 661-8881. breeze-software.com
There are many reasons that industrial facilities and their owners or operators seek to demonstrate compliance with their air quality operating permits and construction permits, as well as ensure that all capital projects and improvement projects are correctly vetted for permitting applicability. Legal requirements and potential enforcement ramifications for not demonstrating compliance with applicable air quality permits are strong justifications for the associated effort. Companies can also derive broad benefits from implementing auditing programs for ensuring compliance with air quality requirements.

Meeting air quality regulatory requirements can provide a springboard for companies to gain business benefits through a process focused on identifying potential improvements and methods of risk mitigation.

A systematic, proactive approach to assessing compliance can also help organizations avoid regulatory fines, negative publicity, increased costs (such as insurance and Workers’ Compensation), and poor employee morale. Potentially the largest benefit is the bottom line or economic improvement that can be identified through limiting the potential for non-compliance and enforcement or mitigating the liability for a company in self-disclosing violations. Examples of the substantial penalties that can result from violations are provided in the table below, which lists the settlements agreed upon under some recent consent decrees issued by the U.S. Environmental Protection Agency (EPA) and the Department of Justice (DOJ) regarding significant Clean Air Act violations.
The civil penalties and costs of additional air pollution control equipment required for mitigation are not insignificant, and EPA will undoubtedly keep a close eye on these entities regarding permit compliance moving forward. Proactive air compliance audits could have been effective at identifying and resolving these compliance concerns before they became enforcement issues.

**Assessing Compliance and Reducing Risk**

One benefit regarding air compliance audits is the ability to assess and demonstrate compliance with current permits and applicable regulations. At the completion of an audit, the auditor will prepare an audit report that details any findings related to applicable regulatory requirements. If use of audit checklists is mandated by the auditee and provided as part of the report deliverable, the audit report will also detail specific regulatory requirements with which the facility has demonstrated compliance. An audit checklist has proven beneficial in several recent scenarios. For example, a state agency conducted an inspection at one facility one month after an air compliance audit was performed there. The facility was able to use the applicable sections of the audit report to demonstrate to the agency that the company had proactively identified regulatory findings and
An additional benefit of conducting an air compliance audit is reducing risk and liability from regulatory findings. Once an auditee has identified areas of non-compliance or opportunities to improve its process, monitoring systems, and efficient operation of emission units and control device equipment, the company is able to take the necessary next steps to mitigate ensuing risk and liability from regulatory findings.

Driving Operating Efficiency

An experienced air compliance auditor can quickly determine inefficiencies from past permitting that are unnecessarily limiting operations. Some examples identified during recent air compliance audits are listed below.

- Permitted emission units no longer in operation – resulted in incorrect potential emissions and potentially limited future projects due to permitting requirements
- Operating rate during performance testing – limited operations due to not operating within 90% of capacity that could be unlimited by re-completing performance testing at higher operating levels
- Unneeded synthetic minor limitations – operation changes resulted in potential emissions no longer needing to be limited to avoid major source classification and no longer requiring operating limitations (fuel usage, process throughput, or product generated)
- Erroneous identification of a unit as an air pollution control device – led to many operation monitoring requirements and limitations for cyclones and filters due to an agency incorrectly identifying the equipment as an air pollution control device rather than recognizing its primary purpose was material and air separation

Training on Regulatory Requirements

A final critical benefit to conducting air compliance audits is the guidance and training provided to the auditee as a natural byproduct of the audit process. An experienced auditor will involve the auditee in the entire audit process, including...
participation in site observations, interviews, and document review. The auditor should keep the auditee (typically the point of contact or escort) updated regarding any compliance issue identified during the audit. By engaging with the auditor and participating in the audit process, the auditee will gain a better understanding of the requirements pertaining to the facility. In this way, audits provide training for auditees who are unfamiliar with regulatory requirements, new to the organization or their role at the facility, or just looking to shore up their understanding of the current regulatory requirements.

There are numerous challenges that can arise during an air compliance audit. Simply put, air regulations are numerous and quite complex. A comprehensive audit will take time to thoroughly evaluate the compliance status of each applicable air regulation. The nuances of the regulations must be explored to confirm compliance, and the facility must be assessed with respect to its air permit. Operating permits typically include federal, state, and local requirements and are often bulky documents which need thorough evaluation. An auditor with air expertise is invaluable during an air compliance audit, especially due to the number of Clean Air Act regulations and the volume of compliance conditions included in air operating permits.

**Electronic Disclosure**

If a significant compliance issue is determined during an air compliance audit, companies now have a new option for disclosing to EPA under the Audit Policy. To modernize the self-disclosing method, a central web-based portal, eDisclosure, became available on December 9, 2015, for companies to electronically self-disclose civil violations under environmental law.

The eDisclosure portal is accessible via EPA’s Central Data Exchange (CDX). The disclosure of potential compliance violations through the portal will qualify for one of two types of automated treatment: Category 1 or Category 2. Category 1 disclosures are violations of the Emergency Planning and Community Right-to-Know Act (EPCRA) (except for chemical release reporting violations or violations with significant economic benefit) as well as EPCRA violations that meet all Small Business Compliance Policy conditions. Category 2 disclosures are all non-EPCRA violations, EPCRA violations where discovery was not systematic, and EPCRA and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) violations where chemical release reporting violations or violations with significant economic benefit occurred.

Category 1 disclosures are treated differently than Category 2 disclosures via the eDisclosure system. For Category 1 disclosures, an electronic Notice of Determination (eNOD) is issued automatically by the eDisclosure system; this eNOD states that the violations disclosed do not result in an assessment of civil penalties. For Category 2 disclosures, the eDisclosure system generates an Acknowledgement Letter (AL) which states that EPA has received the disclosure and will make a determination as to whether the company would be eligible for penalty mitigation if the violation results in enforcement action.

In using the eDisclosure system, there are two important considerations. The first is that the deadline for correcting a self-disclosed violation is determined from the date the violation was discovered, not the date it was disclosed. The second is that no confidential business information can be included in an eDisclosure submittal. If a company must submit a disclosure under the EPA Audit Policy that includes confidential information a public version should be submitted manually to EPA in accordance with 40 CFR Part 2.

**Enforcement Priorities - HAPs**

One of EPA’s enforcement initiatives for the 2017-2019 fiscal years is to reduce emissions of hazardous air pollutants (HAP). Specifically, EPA will be focusing on HAP emissions from product storage tanks, hazardous waste tanks, hazardous waste treatment equipment, and hazardous waste containers. Companies should evaluate their compliance against these requirements, including applicable National Emission Standards for Hazardous Air Pollutants (NESHAP), in order to be prepared in the event of an EPA air compliance inspection.

Whether a company has a mature audit program in place, relatively little auditing activity, or has never conducted an air compliance audit, most can benefit from engaging an external auditor who can bring a fresh perspective on your operations. Outside auditors can also assist your existing audit team in assessing compliance with some of the most rigorous and complex regulatory requirements in the history of air regulations.
On June 3, 2016, the U.S. Environmental Protection Agency (EPA) issued a final New Source Performance Standard (NSPS) Subpart OOOOa to reduce greenhouse gases (GHG) and volatile organic compounds (VOCs) from new, reconstructed, and modified sources located in the “crude oil and natural gas source category.” EPA defines this category of sources as:

1. Crude oil production, which includes the well and extends to the point of custody transfer to the crude oil transmission pipeline or any other forms of transportation; and
2. Natural gas production, processing, transmission, and storage, which includes the well and extends to, but does not include, the local distribution company custody station.

The final NSPS OOOOa rule builds on the 2012 NSPS OOOO requirements by setting emission limits for GHG (in the form of methane) and adding requirements for previously unaffected sources. Some major highlights of the rule include the following:

1. Semi-annual leak detection and repair (LDAR) requirements for well sites;
2. Quarterly LDAR requirements for boosting and gathering compressor stations and natural gas transmission compressor stations;
3. Emission limits and control requirements for pneumatic pumps at natural gas well sites, oil well sites, and natural gas processing plants;
4. Reduced emission completions (i.e., green completions) at hydraulically fractured well sites with a gas-to-oil ratio (GOR) greater than or equal to 300 standard cubic feet (scf) of gas per barrel;
5. Centrifugal and reciprocating compressors subject to requirements at natural gas transmission compressor stations;
6. Addition of emission limits for pneumatic controllers in the natural gas transmission segment; and
7. Professional engineer (P.E.) certification requirements for technical infeasibility determinations for controlling pneumatic pumps and for verification of proper closed vent system (CVS) design.

The final NSPS OOOOa regulation included the following changes from the initially proposed version:

- Setting a fixed schedule (e.g., quarterly or semiannually) for leak monitoring rather than a variable schedule based on performance;
- Allowing the use of Method 21 to identify leaks as an alternate option to optical gas imaging;
- Removing pneumatic pump control requirements for natural gas boosting and transmission compressor stations;
- Encouraging owners/operators to use new technologies to monitor and find leaks by allowing alternative methods of compliance; and
- Phasing in the requirements to use a “green completion” process to capture emissions from hydraulically fractured oil wells, allowing a six-month timeframe for compliance.

A high-level summary of the requirements of NSPS OOOO and OOOOa (highlighted in red) is provided in the table on the adjacent page.

**Real-World Implications: Complying With the New LDAR Requirements**

Well sites and compressor stations that are new, modified, or reconstructed well sites after September 18, 2015 must conduct LDAR surveys. Well sites must perform surveys semi-annually, and compressor stations must survey quarterly. Operators can use optical gas
imaging (OGI) or Method 21 to conduct the required surveys. Companies have 12 months from June 3, 2016, to develop the required LDAR Monitoring Plans (which must include extensive details on the monitoring program and approach) and to perform the first required survey.

While the compliance requirements found in NSPS OOOOa can be largely straightforward, the recordkeeping requirements are extensive. The race is on to develop LDAR monitoring plans for “company-defined areas.” While that term is not defined, EPA has stated that it expects these “company-defined areas” will include similar sites located in a geographically similar area. The LDAR Monitoring Plan must include the following:

- LDAR method (optical gas imaging [OGI] or Method 21);
- Frequency of surveys;
- Details of the equipment used to detect leaks (if using OGI, verification that the OGI camera meets the specifications detailed in the rule);
- Procedures and timeframes for identifying and repairing components, including those that are unsafe to repair;
- Specific procedures for conducting surveys including ensuring adequate thermal background, adverse monitoring condition procedures, training and experience of the operator conducting surveys, and equipment calibration procedures;
- Site maps with defined observation path; and
- Additional information required by Method 21, if applicable.

### Summary of NSPS OOOOa Requirements

<table>
<thead>
<tr>
<th>NSPS OOOOa Affected Facility</th>
<th>Production (Well Site)</th>
<th>Gathering</th>
<th>Gas Processing</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydraulically Fractured Wells</strong></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Centrifugal Compressors</strong></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Reciprocating Compressors</strong></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Pneumatic Controller</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Pneumatic Pumps</strong></td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Storage Vessels</strong></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Equipment Leaks</strong></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td><strong>Sweetening Units</strong></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
### NSPS OOOOa Compliance Deadlines

<table>
<thead>
<tr>
<th>NSPS OOOOa Affected Facility</th>
<th>Standard</th>
<th>Compliance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydraulically fractured wildcat wells, delineation wells, or low-pressure wells</td>
<td>Completion combustion</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Other hydraulically fractured wells</td>
<td>REC, completion combustion unless the gas-to-oil ratio &lt; 300 scf/bbl</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Centrifugal compressors with wet seals (not on well sites, up to the local distribution company [LDC])</td>
<td>95% reduction (P.E. certification if equipped with closed vent system [CVS])</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Reciprocating compressors (not on well sites, up to the LDC)</td>
<td>Change rod packing or route emissions to process (P.E. certification if equipped with CVS)</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Pneumatic controllers at NG processing plants</td>
<td>Zero bleed rate</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Continuous bleed pneumatic controllers between wellhead and the LDC (not at gas processing plants)</td>
<td>≤6 scf/h bleed rate</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Pneumatic pumps at gas processing plants</td>
<td>Zero bleed rate</td>
<td>November 30, 2016</td>
</tr>
<tr>
<td>Pneumatic pumps at well sites</td>
<td>95% reduction if control or process available onsite (P.E. certification if equipped with CVS)</td>
<td>November 30, 2016</td>
</tr>
<tr>
<td>Storage vessels</td>
<td>95% reduction (P.E. certification if equipped with CVS)</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Equipment leaks at gas processing plants</td>
<td>LDAR program</td>
<td>August 2, 2016</td>
</tr>
<tr>
<td>Equipment leaks at well sites and compressor stations</td>
<td>LDAR program</td>
<td>June 3, 2017</td>
</tr>
<tr>
<td>Sweetening units at gas processing plants</td>
<td>Reduce SO₂ as calculated</td>
<td>August 2, 2016</td>
</tr>
</tbody>
</table>

While EPA is allowing operators to develop plans for “company-defined areas,” many operators may find that sites within similar geographic regions are still highly variable, which can add to the burden of developing LDAR Monitoring Plans. EPA does not require operators to submit the LDAR Monitoring Plan initially, but it must be submitted upon request.

### Building a Strong Foundation for the LDAR Program

It is worth the effort to spend time up-front to clearly document LDAR survey procedures, equipment to be surveyed (and detailed lists of equipment not to be surveyed), qualification requirements of surveyors, and other procedures. A proper LDAR plan can assist in avoiding unnecessary repairs and deviations associated with inadequate monitoring and/or recordkeeping. EPA has indicated its intent to migrate NSPS OOOOa reporting to electronic reporting. This will increase the transparency of reported emissions (and subsequent deviations), making the information potentially available to the public and other interested parties. As the information will likely be more publicly accessible, shoring up programs to reduce the number of deviations will be critical.

### P.E. Certifications

EPA is now requiring P.E. certifications for several elements in the rule, including any CVS used to control emissions from new or modified storage vessels, pneumatic pumps, and centrifugal or reciprocating compressors. EPA’s main concern is ensuring the CVS is appropriately designed to handle the volume and composition of gas controlled through the CVS. EPA is also requiring P.E. certifications for any claim that emissions control for a non-greenfield site equipped with a pneumatic pump affected source is “infeasible.” Exactly which CVS will require P.E.
certifications depends on how each state treats CVS on non-NSPS OOOOa affected tanks; it will be important to look at this closely for each state in which you operate.

Natural Gas Diaphragm Pneumatic Pumps

The rule now requires operators to reduce emissions from many natural gas driven diaphragm pneumatic pumps located at well sites and gas processing plants. For gas processing facilities, pneumatic pumps must be air actuated, which is already required for pneumatic devices under NSPS OOOO. Pneumatic pumps at well sites must achieve a 95% reduction in emissions, with some exceptions. For new (i.e., greenfield) well sites, operators will need to consider ways to route emissions from natural gas driven pneumatic diaphragm pumps to a control device located on-site (even if the device cannot meet the required 95% reduction) or otherwise route the emissions into the process.

For non-greenfield sites with new or modified natural gas diaphragm pumps, emissions must be routed to a control device if one is on site. If the site is not equipped with a control device, the operator must submit a certification as part of the annual report identifying that there is a potentially affected pneumatic pump on-site, but no control device is in place. Alternatively, an operator may make the determination that routing the emissions to the existing control device is not feasible; in this case, a P.E. certification must be submitted as part of the annual report identifying the option as “infeasible.”

Reciprocating and Wet Seal Centrifugal Compressors at Transmission Compressor Stations

The compliance requirements for reciprocating and wet seal centrifugal compressors found in NSPS OOOOa are largely the same as those found in OOOO; however, OOOOa expands applicability to compressors in the natural gas transmission segment. Wet seal centrifugal compressors must reduce emissions by 95% from the wet seal oil degassing system; reciprocating compressors must either collect rod packing emissions or track rod packing replacements. From a practical perspective, this change will subject many more wet seal centrifugal compressors to regulation than were previously regulated under NSPS OOOO. The nuances surrounding modification or reconstruction of a wet seal centrifugal compressor have been largely untested under NSPS OOOO, and these determinations will become much more common under NSPS OOOOa.

Preparing for Compliance under NSPS OOOOa

The timeframe to develop compliance tools for NSPS OOOOa is compressed. Many operators now subject to LDAR requirements may never have had to implement a LDAR program in the past and have less than one year to respond. Regulations applying to equipment under NSPS OOOO have been expanded into the natural gas transmission segment, including equipment such as reciprocating compressors, centrifugal compressors with wet seals, and continuous bleed pneumatic controllers. Similarly, requirements that have been in place for hydraulically fractured natural gas wells have been expanded to a much wider universe of wells. While many of the compliance requirements are the same for equipment already covered in NSPS OOOO, NSPS OOOOa has expanded the equipment subject to regulation, and the recordkeeping and reporting requirements are extensive. Upfront planning, including LDAR program development and applicability analyses, can be particularly valuable and it is never too early to start.
On June 3, 2016, EPA published a final rule updating federal permitting regulations for stationary sources in the oil and natural gas industry. Specifically, the final rule clarifies the meaning of the term adjacent for the Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR) permitting programs and the definition of major source under the Title V operating permit program. EPA noted that the final rules were intended to “provide clearer guidance to permitting authorities as well as industry and increase consistency in determinations during the permitting process.”

In the proposed rule, EPA considered two options: one based exclusively on distance and one based on both distance and relationship. The final rule incorporates certain aspects of each option. In the final rule, separate sources will be aggregated as a single source for permitting considerations if they:

1) Are located within ¼ mile of one another; and
2) Share equipment.

It is important to note that these revised definitions are limited to activities classified under Standard Industrial Classification (SIC) Major Group 13 and that the activities must also be under control of the same person (or persons under common control).

Clarifications on the Definitions

EPA has stated that the ¼ mile distance is measured from the center of the equipment of the surface site. For the definition of surface site, EPA referenced the definition in 40 CFR 63 Subpart HH. Examples provided by EPA of shared equipment include, but are not limited to, produced fluids storage tanks, phase separators, natural gas dehydrators, and emission control devices. EPA stated in the preamble to the rule that two well sites that feed to a common pipeline would not be considered to be part of the same stationary source, provided they do not share equipment (e.g., control devices and tanks).

In the response to comments published in the preamble, EPA highlighted the fact that other factors (e.g., location of underground assets, restrictions on well spacing, lease agreements, etc.) are more likely to affect siting decisions compared to a desire to avoid major source permitting. Furthermore, EPA clarified that the intent of the rule was to avoid “daisy chaining” multiple sources together over a large distance, which can introduce unintended complications. Similarly, EPA avoided finalizing a “functional interrelatedness” aspect to the final rule outside the distance criteria to reduce the burden on permitting authorities.

Implementation Questions

In the final rule, EPA noted that state and local agencies are not required to implement the revised definitions. For delegated states, the rule becomes effective upon publication. For those states with EPA-approved State Implementation Plans (SIPs), the state can choose whether to incorporate the new definition in its next SIP revision. This allows states to maintain existing stationary source determination criteria they have used historically or to adopt provisions more stringent than EPA’s final definition. Finally, EPA clarified that the revised definition applies prospectively and revisiting historical source determinations is not required as part of this rulemaking.

In conclusion, the impact of this change on operators will vary from state to state, depending on each state’s SIP. Stay tuned, as this will be an evolving issue for many months and years to come.
Adjacent Equipment in the Oil and Gas Industry: Simplified Examples

New or modified equipment/activities are “adjacent” if they are on the same site, or on sites that share equipment and are within ¼ mile of each other.

**LEGEND**
- Gas Well
- Oil Well
- Tank Battery
- Shared Equipment

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Source: https://www3.epa.gov/airquality/oilandgas/actions.html
Refinery Sector Rule Imposes Broad New Requirements

By SHARON KILLIAN, Principal Consultant — New Orleans, LA and LORI PITTMAN, MANAGING Consultant — New Orleans, LA

Background & Applicability

On September 29, 2015, EPA issued its final Risk and Technology Review (RTR) for the Petroleum Refinery Sector, also known as the Refinery Sector Rule (RSR), which was proposed on June 30, 2014. The final rule was published in the Federal Register on December 1, 2015, with an effective date of February 1, 2016. The final rule requires continuous fenceline monitoring for benzene and calls for a comprehensive program of process changes and pollution prevention targeted at reductions in visible flare emissions and releases by pressure release devices (PRDs). The new requirements also mandate additional reductions from storage tanks and delayed coker operations, some of which had no controls required previously, as well as new control requirements for maintenance activities and episodic releases that were previously unregulated.

The RTR rule applies only to major sources of hazardous air pollutants (HAPs) and not to area sources. A major source is defined as 10 tpy of any one HAP and/or 25 tpy of combined HAPs.


RSR-Affected Emission Sources

MACT CC (Refinery MACT I) Affected Emission Sources
- Delayed Coking Units (DCUs)
- Miscellaneous Process Vents (MPVs), including maintenance vents
- Flares as control devices
- Storage tanks
Summer 2016 | Environmental Quarterly

Fugitive equipment leaks (through fenceline monitoring)
Marine loading

MACT UUU (Refinery MACT II) Affected Emission Sources
- Catalytic Reformer Units (CRUs)
- Fluid Catalytic Cracking Units (FCCUs)
- Sulfur Recovery Units (SRUs)

Big Picture Requirements of the New RSR Rule

The main provisions of the RSR include the following:

- New emissions controls for refinery storage tanks, CRUs, and DCUs;
- Work practice standards to reduce emissions from atmospheric PRDs and flares;
- Continuous benzene monitoring at the refinery fenceline “to improve the management of fugitive emissions” per the rule preamble;
- Elimination of exemptions to emission limits for uncontrolled releases during start-up, shutdown, and malfunction;
- Technical corrections and clarifications to the Petroleum Refinery New Source Performance Standards (NSPS) J and Ja. (*not covered in this article*)

Reductions from Storage Tanks, Catalytic Reforming Units, and Delayed Coking Units

Under the new rule, storage vessels with smaller capacities and lower vapor pressure content must implement certain requirements to control emissions previously applicable only to larger and higher-pressure material storage vessels. For example, the original capacity and vapor pressure limits were 47,000 gallons and 1.5 psia (maximum monthly). The new cutoffs under the refinery sector rule, listed below, are similar to the HON (Hazardous Organic NESHAP – 40 CFR Subpart F, G, H, and I). Additionally, the HAP content remains at 4%.  

- 20,000 – 40,000 gallons and above, 1.9 psia
- Above 40,000 gallons, 0.75 psia

Furthermore, Group 1 storage vessels must comply with the requirements of Generic MACT [40 CFR Part 63, Subpart WW] and thus will be potentially subject to additional fittings, guide-pole controls, etc.

For DCUs at existing refineries, the new rule establishes the following options for maximum venting pressure or temperature:

- Coke drum cannot vent to atmosphere until the pressure is at < 2 psig averaged over 60 decoking events; OR
- Temperature < 220 °F averaged over 60 decoking events.

The rule also establishes new provisions for decoking operations with water overflow as well as double quenching.

The new rule removed the control exemption for CRUs during active purging when the reactor pressure is ≤5 psig because EPA believes that active purge systems can direct the gas to a control system regardless of system pressure.

Reductions in Releases from Pressure Relief Devices

The final rule establishes the following work practice standards for releases from PRDs to the atmosphere:

- Must be equipped with a monitoring device (such as a rupture disk indicator, magnetic sensor, motion detector on the PRD valve stem, flow monitor, or pressure monitor) that identifies a pressure release, records the time and duration, and notifies operators that a release is occurring.
- Must apply a minimum of three prevention measures to each PRD, such as flow, temperature, level and/or pressure indicator meters; documented routine inspection and maintenance programs; or safety instrumentation systems.
In the event of a release, facilities are required to perform a root cause analysis to determine the cause of the PRD release event and to quantify and report the amount of the release. Following a release, facilities must implement corrective action. Releases caused by operator error or negligence and repeat release events are considered deviations and must be reported in semiannual compliance reports.

Reductions in Flare Emissions

Under the new rule, new flare provisions have been implemented to further assure 98% combustion efficiency and to supersede the flare General Provision requirements. Like PRDs, repeat events outside the work practice requirements are considered deviations. Flares must now meet the following operating conditions:

- Continuously lit pilot flame at all times
- No visible emissions when flare vent gas is below the smokeless capacity of the flare
- Net heating value for the combustion zone gas (NHVcz), ≥ 270 BTU/ft³ on a 15-minute average, estimated using flare vent gas composition monitoring
- Compliance with one of two options for flare tip velocity

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Compliance Method Highlights</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flare pilot presence</td>
<td>Monitoring device (including, but not limited to, a thermocouple, ultraviolet beam sensor, or infrared sensor)</td>
</tr>
<tr>
<td>Visible emissions</td>
<td>Option 1: Daily visual observation using EPA Method 22&lt;br&gt;Option 2: Video surveillance camera to continuously record</td>
</tr>
<tr>
<td>Velocity Option 1 (single limit)</td>
<td>flare tip velocity ≤ 60 ft/sec&lt;br&gt;Velocity is based on flow rate / cross sectional area. Install continuous monitoring system to measure flow to flare headers.</td>
</tr>
<tr>
<td>Velocity Option 2 (two limits)</td>
<td>Maximum allowable velocity is based on gas composition estimated via continuous monitor or 8-hour grab samples or calorimeter</td>
</tr>
<tr>
<td>Combustion zone operating limits</td>
<td>Based on gas flow rates and equation [per 60.670(m)]</td>
</tr>
<tr>
<td>Dilution operating limits</td>
<td>Based on gas flow rates and equation [per 60.670(m)]</td>
</tr>
</tbody>
</table>

Removal of Exemption for Releases during Start-up, Shutdown, and Malfunctions

The final rule eliminates the exemption to emission limits for uncontrolled releases during startup, shutdown, and malfunction (SSM) events. In its place, EPA has finalized alternate work practices to be performed during startup, shutdown, and hot standby, including the requirements discussed for PRDs and classifying the control device bypass of a Group 1 miscellaneous process vent as a violation. Other alternative work practices include the following:

- Perform a root-cause analysis and implement corrective action following certain emergency flaring events during SSM periods, limit the number of events allowed to occur over a three-year period before it is considered a deviation, and develop prevention measures, such as a flare management plan.
- MPVs can now be classified as Maintenance Vents and, if these vent meet specified criteria, emissions can be released to the atmosphere.

Continuous Fenceline Monitoring

The rule establishes a work practice standard of continuous, but not necessarily real-time, monitoring, to improve the management of fugitive emissions from sources such as leaking equipment and wastewater treatment. All refineries must utilize a network of passive diffusive tube samplers at the refinery fenceline, collecting a sample at least once every 14 days. The monitors must encircle the refinery fenceline. If fenceline concentrations exceed the 0.9 µg/m³ threshold, corrective action is required.

Additionally, the rule promulgates standards for FCCUs during SSM events. During startup, shutdown, and hot standby of FCCUs, refineries can choose to comply with one of two emissions standards for metal HAPs and one of two emissions standards for organic HAPs.
## Refinery Sector Rule Compliance Deadlines

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Compliance Deadline</th>
<th>Citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flares (as a control device for CC and UUU)</td>
<td>January 30, 2019</td>
<td>Multiple references including 63.670</td>
</tr>
<tr>
<td>DCUs PRDs</td>
<td>January 30, 2019 (see note)</td>
<td>Table II of Subpart CC</td>
</tr>
<tr>
<td>Include in-situ sampling systems as MPV</td>
<td>January 30, 2019</td>
<td>63.641 Definitions</td>
</tr>
<tr>
<td>Fenceline monitoring</td>
<td>January 30, 2018 (see note)</td>
<td>Table II of Subpart CC</td>
</tr>
<tr>
<td>Group 1 storage vessels comply with Generic MACT controls</td>
<td>April 29, 2016 (see note)</td>
<td>Table II of Subpart CC</td>
</tr>
<tr>
<td>Upgrades for any storage vessels to meet revised requirements</td>
<td>Storage vessel is emptied and degassed, or January 30, 2026 (whichever occurs first)</td>
<td>63.660(d)</td>
</tr>
<tr>
<td>Remove control exemption for CRU active purging ≤5 psig</td>
<td>January 30, 2019</td>
<td>February 9, 2016 Federal Register proposal (not final)</td>
</tr>
<tr>
<td>FCC SU/SD/ hot standby standards and SRU SU/SD standards Subpart CC Maintenance vents</td>
<td>August 1, 2017 (see note)</td>
<td>February 9, 2016 Federal Register proposal (not final)</td>
</tr>
</tbody>
</table>

*Note: Deadlines apply to refinery sources constructed or reconstructed pre-June 30, 2014.*

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For metal HAP emissions:
- Comply with either NSPS requirements, PM limits, and nickel limits; OR
- Maintain inlet velocity to the primary internal cyclones of the catalyst regenerator at or above 20 ft/sec.

For organic HAP emissions:
- Comply with either specified operating limits, NSPS requirements, or CO emission limits; OR
- Maintain the O₂ concentration in the exhaust gas from the catalyst regenerator at or above 1% volume.

The rule also includes standards for SRUs. During startup and shutdown, they must:
- Send any startup or shutdown gases to a flare, thermal oxidizer, or incinerator, OR
- Comply with NSPS requirements or the total reduced sulfur emission limits in the rule.

### Recommended Path Forward

As a first step, refineries should generate an action plan with checklists via an Excel-based (or similar) workbook to document applicable amendment requirements, compliance gaps, and compliance deadlines. This workbook could be organized by source category, such as tanks, vents, and flares. With deadlines ranging from 2016 to 2019, and each deadline triggering multiple requirements, it is critical to identify action items with due dates to meet the multiple deadlines.

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**Sample of RSR Action Items**

- Identify storage vessels that should be classified as Group 1 and whether any existing Group 1 vessels require additional fittings
- Revisit operating procedures for any new work practices
- Review Delayed Coker design and CRU operation
- Evaluate flare monitoring
- Install fenceline monitoring equipment
- Inventory PRDs and Maintenance Vents
- Draft flare plans and Root Cause Analysis (RCA)/Corrective Action Analysis (CAA) procedures
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