Comments of the Interstate Natural Gas Association of America on the U.S. Environmental Protection Agency's Proposed Rule: "Proposed Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard"

87 Fed. Reg. 20,036 (April 6, 2022)

Docket ID No. EPA–HQ–OAR–2021–0668

Interstate Natural Gas Association of America

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Executive Summary

The Interstate Natural Gas Association of America ("INGAA"), a trade association that represents 26 members of the interstate natural gas pipeline industry, is pleased to submit comments on the United States Environmental Protection Agency's ("EPA" or the "Agency") proposed "Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard" ("Proposed Rule"). The Proposed Rule represents significant efforts on the part of the Agency to address interstate transport of nitrogen oxides ("NOx") and the "significant contribution" of upwind states to downwind nonattainment and maintenance issues. INGAA has substantial experience addressing these issues and a track record of working with EPA to develop feasible and environmentally meaningful rules to address air quality.

The Proposed Rule is based on underlying assumptions and takes approaches to regulation that INGAA believes EPA should reevaluate. Most significantly, the Proposed Rule reflects a considerable underestimation of the number of units serving the pipeline transportation of natural gas industry that would become subject to new proposed emission limits. INGAA's estimates of these units are nearly five times larger than EPA's assumptions. The emission reductions that would result such a miscalculation would overwhelm EPA's intent as expressed in the Proposed Rule. Those projections, however, are what EPA has determined are needed to address the "significant contribution," as defined by the Clean Air Act, of the pipeline transportation of natural gas industry to downwind air quality problems. For that reason, the Proposed Rule would result in over-control in violation of Supreme Court and D.C. Circuit precedent. EPA can address this over-control problem by withdrawing the Proposed Rule and issuing a new proposal that achieves the emission reductions EPA has concluded are appropriate.

EPA could achieve that outcome, for instance, by reevaluating the horsepower threshold and potentially raising it to reflect the realities industry faces. INGAA looks forward to supporting EPA's efforts in this regard.

In addition, EPA should incorporate emissions averaging as a compliance flexibility. Averaging will help to ensure that states and sources achieve the overall environmental objectives of the Proposed Rule while offering a level of flexibility that will make compliance more efficient and effective overall. EPA itself, with INGAA's input, developed emissions averaging rules in previous rulemakings and has approved the use of NOx emissions averaging in state plans for the natural gas industry. Incorporating averaging here would help ensure the successful implementation of a new rule.

EPA should also better account for realities facing the industry with respect to the time needed to complete the retrofits this new regulatory initiative envisions. There are considerable constraints on expertise and materials that will be needed to complete the installation of controls to meet the Proposed Rule's emission limits. These constraints render the proposed 2026 compliance timeframe unworkable. INGAA requests that EPA consider a phased approach to compliance that can be tailored to ensure the most timely implementation possible.

For similar reasons, the Proposed Rule would have serious impacts on reliability. EPA has not assessed how the natural gas pipeline system will be impacted or offered any guidance on how the massive effort to retrofit affected units could be coordinated to avoid reliability impacts. EPA must address reliability to provide an adequate basis for a new rule.

The Proposed Rule also includes a number of technical assumptions and requirements related to achieving and assuring compliance with the emission limits it would impose. INGAA believes that a number of changes to these provisions is warranted, but also supports many of the

provisions EPA has developed. For instance, although INGAA does not disagree with the emission limits EPA has proposed for the Proposed Rule's affected units, INGAA does believe that four stroke lean burn engines are not likely to comply with the proposed emission limits through installation and operation of selective catalytic reduction controls and are instead much more likely to use low emission combustion technology. A new rule should address that and similar issues.

INGAA also supports EPA's proposal to rely on parameter monitoring for compliance assurance and not to require continuous emission monitoring systems. On the other hand, INGAA does not believe EPA's proposed requirements that sources conduct semi-annual performance tests and semi-annual reporting are necessary to ensure compliance with the Proposed Rule, and they may be practically impossible for certain units.

Finally, INGAA has identified apparent errors or areas for clarification in the Proposed Rule's regulatory language and suggests revisions in these comments. INGAA further notes that substantial changes or departure from the proposal, including the addition of new states or new sources to the rule's coverage, would require a new proposed action.

INGAA supports appropriate action to address upwind state contributions to downwind nonattainment and maintenance issues for the 2015 ozone NAAQS. The Proposed Rule, however, is unfortunately premised on significantly flawed information that will undoubtedly lead to ongoing legal disputes and implementation problems. For those reasons, the proposal should be withdrawn, and EPA should issue a new proposal that remedies over-control. INGAA offers its expertise to assist in those efforts and appreciates the opportunity to continue working with EPA.

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I. Introduction

The Interstate Natural Gas Association of America ("INGAA"), a trade association that represents 26 members of the interstate natural gas pipeline industry, respectfully submits these comments in response to the United States Environmental Protection Agency's ("EPA" or the "Agency") proposed rule entitled "Federal Implementation Plan Addressing Regional Ozone Transport for the 2015 Ozone National Ambient Air Quality Standard" (hereinafter, "Proposed Rule"), which was published in the Federal Register on April 6, 2022.[1]

INGAA members own and operate a large percentage of the reciprocating internal combustion engines ("RICE" or "engines") used in the interstate transportation of pipeline natural gas.[2] INGAA member companies transport more than 95 percent of the nation's natural

[1] 87 Fed. Reg. 20,036 (Apr. 6, 2022).

[2] The Proposed Rule does not appear to limit its application to interstate transportation of natural gas. INGAA's representation of its members, however, only extends to interstate pipelines. Although many of the issues addressed

gas, through approximately 200,000 miles of interstate natural gas pipelines. In 46 of the 48 contiguous United States, INGAA member companies operate over 5,400 natural gas compressors at over 1,300 compressor stations and storage facilities along the pipelines to transport natural gas to local gas distribution companies, industrial manufacturers, gas marketers, and gas-fired electric generators. This includes over 3,500 stationary natural gas-fired reciprocating engines. Accordingly, this rulemaking is of tremendous importance to INGAA and its members.

EPA first established primary and secondary national ambient air quality standards ("NAAQS") to protect against the adverse effects of nitrogen oxides ("NOx") and ozone in 1971 and has revised the standards numerous times since then.[3] EPA completed the most recent review of the primary and secondary NOx standards in 2018 and 2012, respectively, where the Agency retained the pre-existing NAAQS. NOx emissions, as a precursor to the formation of ozone, are subject to significant regulation under EPA's ozone NAAQS program. EPA last revised the ozone standards in 2015, setting the primary and secondary ozone NAAQS at 70 parts per billion ("ppb") in the form of the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years.[4]

In addition to addressing emissions from sources located within NOx and ozone nonattainment areas, EPA has a long-established approach to reducing NOx emissions from sources located in "upwind" states that "significantly contribute" to either nonattainment or interference with maintenance in "downwind" states. EPA's authority to address the interstate

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in these comments may apply with equal force to intrastate pipelines and natural gas transportation, INGAA does not purport to speak for that segment of the industry.

[3] Primary standards are intended to protect the public health, and secondary standards are intended to protect the public welfare.

[4] 80 Fed. Reg. 65,292 (Oct. 26, 2015).

transport of NOx emissions is found in the good neighbor provision of the Clean Air Act ("CAA" or the "Act").[5] That provision requires each state to submit a State Implementation Plan ("SIP") that prohibits emissions that will significantly contribute to nonattainment of a NAAQS, or interfere with maintenance of a NAAQS, in a downwind state. If a state fails to submit a good neighbor SIP or if EPA disapproves such a SIP, the Agency may be authorized to promulgate a Federal Implementation Plan ("FIP") in its place. The current Proposed Rule is such a FIP.

INGAA and its members have a strong commitment to environmental stewardship and to reducing the interstate gas pipeline industry's NOx emissions. NOx emissions from the interstate natural gas pipeline industry are not only subject to the NAAQS, but to a host of other CAA-based programs. These include emission control technology requirements for new or modified major emitting facilities and compliance with new source performance standards ("NSPS") that require the "best system of emissions reduction."[6] Pursuant to these regulatory requirements and other voluntary measures, INGAA members have collectively achieved significant reductions in NOx emissions.

EPA's Proposed Rule attempts to address the exceedingly complex issue of interstate transport of NOx and its contribution to downwind nonattainment of the 2015 ozone NAAQS from electric generating units ("EGUs") alongside emissions from seven non-EGU industrial sectors. The EGU portion of the Proposed Rule would apply to 25 states, and the non-EGU portion of the Proposed Rule would apply in 23 states, covering a vast and diverse geographic area. The covered states for non-EGU sources are Arkansas, California, Illinois, Indiana, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New

[5] CAA § 110(a)(2)(D)(i)(I).

[6] 40 C.F.R. § 52.21(k)(1); 42 U.S.C. §§ 165(a)(4), 169(3); 40 C.F.R. § 165(a)(1)(xiii).

Jersey, New York, Ohio, Oklahoma, Pennsylvania, Texas, Utah, Virginia, West Virginia, Wisconsin, and Wyoming.[7] Of the seven non-EGU industries, the only sources directly owned or operated by INGAA's members are RICE in the pipeline transportation of natural gas.[8]

The Proposed Rule would establish NOx limits for stationary, natural gas-fired, spark ignited RICE ("stationary SI engines") within the natural gas pipeline transportation industry that have a maximum rated capacity of 1,000 horsepower ("hp") or greater.[9] The applicable limits would be:

Engine Type and Fuel[10]	**Proposed NOx Emission Limit**	**Additional Information**
Natural Gas Fired Four Stroke Rich Burn ("4SRB")	1.0 g/hp-hr	Limits reviewed ranged between 0.2 and 3.0 g/hp-hr
Natural Gas Four Stroke Lean Burn ("4SLB")	1.5 g/hp-hr	Limits reviewed ranged between 0.5 and 3.0g/hp-hr
Natural Gas Fired Two Stroke Lean Burn ("2SLB")	3.0 g/hp-hr	Limits reviewed ranged between 0.5 and 3.0 g/hp-hr

These emission limits would begin to apply at the start of the 2026 ozone season. EPA states that it has selected these limits based on reviews of reasonably available control technology ("RACT") NOx rules, air permits, and model rules by the Ozone Transport Commission.[11]

EPA asserts that the limit for Natural Gas Fired 4SRB RICE is designed to be achievable through installation and operation of Non-Selective Catalytic Reduction ("NSCR") controls.[12] The limit for Natural Gas 4SLB RICE is designed to be achievable through installation and

[7] 87 Fed. Reg. at 20,039.

[8] The other non-EGU industries are: kilns in cement and cement product manufacturing; boilers and furnaces in iron and steel mills and ferroalloy manufacturing; furnaces in glass and glass product manufacturing; and high-emitting equipment and large boilers in basic chemical manufacturing, petroleum and coal products manufacturing, and pulp, paper, and paperboard mills. *Id*.

[9] *Id*. at 20,142.

[10] *Id*. at 20,142, Table VII.C–1.

[11] *Id*. at 20,142.

[12] *Id*.

operation of selective catalytic reduction ("SCR") technology.[13] For Natural Gas Fired 2SLB RICE, EPA states the limit is designed to be achievable with layered combustion controls.[14]

For all of the limits, the Proposed Rule says that the covered RICE can install different emission control technology than the technology selected by EPA so long as the source achieves the applicable emission rate.[15] The cost-effectiveness of each control option appears to have been evaluated against EPA's cost threshold of $7,500 per ton.[16]

The Proposed Rule also includes monitoring and reporting requirements to ensure that the limits are being met at all covered stationary SI engines. The Proposed Rule would require semi-annual performance testing in accordance with 40 C.F.R. § 60.8. RICE would monitor hours of operation and fuel consumption to calculate ongoing compliance.[17] EPA proposes to use a parameter-based monitoring approach, although it requests comment on alternative monitoring systems.[18] Finally, all covered industries would be required to submit electronic copies of performance test reports, performance evaluation reports, quarterly and semi-annual reports, and excess emissions reports through EPA's Central Data Exchange ("CDX") using the Compliance and Emissions Data Reporting Interface ("CEDRI").[19]

As demonstrated in these comments, many of EPA's assumptions for the pipeline transportation of natural gas industry are seriously flawed and will require substantial changes to the Proposed Rule. Of particular concern, the Proposed Rule reflects a significant

[13] *Id*.

[14] *Id*. at 20,143.

[15] *Id*. at 20,142.

[16] *Id*. at 20,142-43.

[17] *Id*. at 20,143.

[18] *Id*.

[19] *Id*.

underestimation of the number of affected units and the proposal's resulting emission reductions. That miscalculation leads to inaccurate cost assessments and would result in substantial over-control of the pipeline transportation of natural gas industry in violation of the law. Further, the Proposed Rule does not contain basic and well-demonstrated compliance flexibilities like emissions averaging, and it would impose a compliance deadline for the pipeline natural gas sector that would result in major disruptions to the supply of natural gas. These significant negative impacts on natural gas reliability would result in increased consumer costs of natural gas and could lead to unnecessary facility closures due to unlawful over-control and infeasible compliance deadlines. EPA should remedy these issues, consistent with the case law that allows EPA to tailor its actions to avoid imposing standards that regulated industry cannot possibly meet.[20] In addition to EPA's underestimation of impacted sources and issues that stem from that error, there are a number of technical issues raised by the Proposed Rule that the Agency can easily remedy, thereby avoiding unnecessary hardship for the industry while maintaining the environmental integrity of the proposed regulatory program. Some of these technical issues are raised in requests for comment by EPA, and others are already reflected in the preamble or the proposed regulatory text.

Although INGAA recognizes that EPA wishes to proceed with this rulemaking to timely address ozone nonattainment in downwind states by the relevant deadlines, INGAA respectfully suggests that EPA take the time needed to develop a well-supported final rule. In accordance with the CAA, a number of states submitted their SIPs before the October 1, 2018 deadline.[21] But EPA failed to take action on these SIPs within the timelines required of it—as evidenced by

[20] *Wisconsin v. EPA*, 938 F.3d 303, 367 (D.C. Cir. 2019).

[21] 87 Fed. Reg. at 20,058.

the four deadline suits that were filed against the agency.[22] More than 12 months after its approval or disapproval was required, on February 22, 2022, EPA proposed to disapprove 19 good neighbor plan SIP submissions.[23] Under the consent decrees for three of these suits, EPA was required to take final action on SIP submissions by April 30, 2022 (or, if it proposed to disapprove any SIP submissions and proposed a replacement FIP by February 28, 2022, the deadline would be extended to December 30, 2022). For seven other states, on December 5, 2019, EPA published a rule finding these states failed to submit or otherwise make complete SIP submissions, thereby requiring the agency to promulgate a FIP no later than January 6, 2022, unless prior to that time, the state made a submission to meet the requirements of CAA section 110(a)(2)(D)(i)(I) and EPA fully approved such submission.[24] However, it wasn't until April 6, 2022, that EPA published the Proposed Rule.[25] Rushing to finalize the Proposed Rule to make up for previously missed deadlines should not be done at the expense of a reasoned and defensible rule. Pushing forward a rule simply to meet deadlines will have unintended consequences that will negatively impact regulated parties and improperly shift EPA's burden to industry. Additionally, rushing the Proposed Rule invites litigation alleging that EPA has acted arbitrarily and capriciously. These are all outcomes that can and should be avoided. While it may take longer to finalize a rule after carefully considering industry's comments, including those

[22] *See id*. at 20,057 n.69 (noting there are consent decrees related to three of these suits: *New York et al. v. Regan,* (No. 1:21–CV–00252, S.D.N.Y.), *Downwinders at Risk v. Regan*, (No. 21–cv–03551, N.D. Cal.); *Our Children's Earth Foundation v. EPA*, (No. 20–8232, S.D.N.Y.)). The fourth deadline suit was filed on March 8, 2022, to compel EPA to perform its non-discretionary duty to promulgate a good neighbor FIP for New Mexico: *Wildearth Guardians v. Regan*, (No. 22-cv-174, D.N.M.)

[23] *See id.* at 20,057 n.75.

[24] *See* 42 U.S.C. § 7410(c)(1)(A).

[25] 87 Fed. Reg. at 20,057-58.

contained herein, any such delay is not unreasonable in light of the complexity of the Proposed Rule. EPA must take the time to do this correctly.

For all of these reasons, INGAA strongly advises that EPA address the concerns raised in these comments. INGAA requests that EPA withdraw the proposal and offer a new proposed rule that substantially revises its regulatory approach.

II. EPA Has Vastly Underestimated the Number of Engines that Would Be Subject to its Proposed Rule, Resulting in Serious Ramifications for Industry and the Validity of the Proposal.

In the preamble and supporting documentation, EPA estimates that there are 307 affected units in this sector.[26] Based on review of INGAA member information, it is apparent that EPA has significantly underestimated the impacts of the Proposed Rule for natural gas transmission and storage companies by miscounting the number of affected units. As these comments explain, EPA's Proposed Rule would in fact apply to nearly five times the number of units that EPA assumes, vastly increasing the costs and time for compliance with the Proposed Rule and requiring more than twice as many emission reductions than EPA believes are necessary. INGAA understands that these results were not EPA's intention and that EPA's interest is in appropriately controlling only the most significant sources of NOx emissions in the pipeline transportation of natural gas sector. We expect the Agency would agree that the Proposed Rule must be substantially revised to address the incorrect factual underpinnings of the

[26] *See, e.g.*, *id*. at 20,090.

proposal and to achieve the Agency's policy goals—including the overall amount of NOx emission reductions—that EPA has identified as appropriate for this rulemaking.

These comments will help EPA to address those issues. Based on information currently available to INGAA members,[27] an estimate of actual unit counts and resulting emissions reductions was prepared:

- 1,199 engines owned or operated by INGAA members in natural gas transmission and storage would require control. **This is four times the EPA estimate.**

- Approximately 181 additional engines owned or operated by INGAA members currently include emission controls but cannot meet the proposed NOx limits, thus requiring incremental control. **The collective total of 1,380 reciprocating engines owned or operated by INGAA members requiring NOx control is 4.5 times EPA's estimate.**

- Another 678 units owned or operated by INGAA members that meet the emission limits would incur incremental compliance costs to address Proposed Rule requirements for biannual emissions tests and continuous parameter monitoring. For controlled units, compliance is typically based on an annual emissions test, and parameter monitoring is not typically required.

- While EPA projects NOx reductions of 55,546 tons per year ("TPY") for all covered states combined, INGAA's estimate indicates **additional reductions** in most states and total reductions of **over 57,000 TPY more than EPA's estimate**. This is more than double (203.4%) the reductions EPA estimates.[28]

As shown below, significant disparities exist in all states where pipeline transportation RICE are common. These disparities are of such a nature and magnitude that they require serious

[27] Although the comment period has limited the amount of information that INGAA has been able to compile at this time, INGAA would be pleased to continue to work with EPA to further evaluate the number of affected units and to help the Agency develop rule provisions that better reflect the realities of the industry. While initial information has been gathered on affected unit counts and location, the comment schedule precluded the ability to conduct a detailed, state-by-state analysis of EPA's underestimation of NOx reductions and costs.

[28] INGAA members account for 79 percent of the RICE included in EPA's list of 307 units, and INGAA members comprise the vast majority of interstate natural gas transmission companies, but these estimates do not include pipeline companies that are not INGAA members. In addition, INGAA data estimates are from transmission and storage operations and do not include RICE in the gathering and boosting segment located between the gas production and gas processing segments. RICE in gathering and boosting would also be affected units based on the proposed definition of "pipeline transportation of natural gas" in section 52.41(a). Many additional units would be affected in that segment, and the total count of affected units may be more than double the values presented above for transmission and storage facilities operated by INGAA members.

reconsideration of key aspects of the Proposed Rule and the proposed approach to regulating the natural gas pipeline transportation sector. EPA might, for instance, address some of these issues by revising the hp applicability threshold for affected units to more appropriately target sources with significant annual emissions. EPA might also further refine the definition of "affected unit." Because the issues identified in these comments are so central to EPA's proposed action, the Agency should also consider issuing a supplemental proposal for the natural gas pipeline transportation portion of the Proposed Rule. INGAA believes such an approach is warranted.

A. EPA's State-by-State Unit Counts Differ Significantly from Data Available to INGAA and its Members.

INGAA compiled a state-by-state assessment of affected units for comparison to EPA estimates.[29] Table 1 provides a comparison of EPA unit counts for the pipeline transportation of natural gas sector to INGAA-compiled counts of affected RICE requiring control (i.e., currently uncontrolled), as well as units with NOx emission controls in place that would require additional control to meet the proposed NOx standard.[30]

Table 1. State-level comparison of EPA count of affected pipeline transportation reciprocating engines to actual INGAA member count of units requiring NOx control or incremental control.

	AR	IL	IN	KY	LA	MI	MN	MS	MO	NY	OH	OK	PA	TX	UT	VA	WV	WI	WY
EPA	10	22	3	17	45	21	9	25	22	2	25	32	7	26	4	9	20	0	6
INGAA[1]	52	51	46	121	191	95	37	218	32	12	79	38	1	70	10	25	87	11	23
INGAA[2]	0	11	0	0	13	0	0	7	0	17	19	1	57	45	0	0	0	0	3

[29] EPA data is available from docket document number EPA-HQ-OAR-2021-0668-0191, which includes a technical memorandum and an Excel file identifying affected non-EGU units. "Technical Memorandum Describing Relationship between Proposed Applicability Criteria for Non-EGU Emissions Units Subject to the Proposed Rule and EPA's *'Screening Assessment of Potential Emissions Reductions, Air Quality Impacts, and Costs from Non-EGU Emissions Units for 2026*'" (Mar. 30, 2022).

[30] Four of the 23 states with non-EGU controls are not shown in Table 1 (California, Maryland, Nevada, and New Jersey have no, or limited, units). EPA estimates one affected unit in California, and INGAA estimates four units, but all are controlled. In Maryland, EPA estimates one unit; INGAA data indicate no uncontrolled units and 14 units that would meet the proposed standard. EPA estimates no affected units in Nevada and New Jersey. INGAA data indicate there are a total of four controlled units in Nevada and New Jersey, and eight New Jersey units with emission controls in place that would require additional control to meet the proposed standard.

INGAA[1]: Count of reciprocating engines requiring NOx control.
INGAA[2]: Count of units with NOx control installed that do not meet the proposed limits and would require incremental control.

These data discrepancies demonstrate, even at this high level of detail, the serious nature of the flaws in the current basis of support for the Proposed Rule. When an agency relies on a fatally flawed factual record as the justification for a regulation, that regulation is inherently arbitrary and capricious.[31] This underscores the need for EPA to substantially revise, if not re-propose, the Proposed Rule.

B. EPA Has Miscounted Affected Units Because its Applicability Threshold Does Not Take Utilization into Account.

EPA explains that a NOx emission rate of 100 TPY provided the screening basis for identifying affected units. For pipeline transportation RICE, EPA equates that emission rate with the 1,000 hp applicability threshold in the Proposed Rule. This assumption is incorrect, and it has distorted much of what flows from it in the Proposed Rule. In particular, this error would inadvertently pull far more sources into the scope of the program than EPA apparently intends, leading to serious compliance concerns, unnecessary emission reductions and unlawful over-control. This serious flaw is another reason for EPA to withdraw or substantially revise the Proposed Rule.

For EPA's assumption to be accurate, an uncontrolled unit would need to operate a significant portion of the year, but that is not consistent with interstate natural gas transmission operations. For example, depending on the uncontrolled NOx emission factor used (*e.g.*, EPA AP-42 factor versus EPA factor from NOx SIP Call Phase 2 rule), a 1,000 hp two-stroke lean

[31] *Almay, Inc. v. Califano*, 569 F.2d 674, 682 (D.C. Cir. 1977) (regulation was arbitrary and capricious because it relied heavily on discredited study); *Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923,935 (5th Cir. 1998) ("A regulation cannot stand if it is based on a flawed, inaccurate, or misapplied study.").

burn engine would need to operate 62 percent to 86 percent of the year to emit 100 TPY. Actual operations are often much less than 25 percent of the year for gas transmission RICE in this size range, and ozone season operation may be very low for pipelines serving markets with lower gas demand in the summer. Transmission compressor stations are designed to meet peak demand days and typically include significant over-capacity.[32] This results in average annual utilization on the order of 40–45 percent for most natural gas transmission pipelines, with some units within the system operating minimally—*e.g.*, only when needed during peak demand during cold winter weather events.

Utilization data is not readily available for all units, but there are data sources available that demonstrate utilization for natural gas transmission and storage operations. For example, compressor stations that report greenhouse gas ("GHG") emissions to EPA under Subpart W of the GHG Reporting Program ("GHGRP") report annual hours in operating mode, standby-pressurized mode, and shutdown depressurized mode for each unit at the affected facility. A white paper[33] from the Pipeline Research Council International ("PRCI") compiled Subpart W utilization data for hundreds of affected facilities over six years, and those results are presented in Figure 1. For completeness, turbine data is included as well as RICE data. The figure shows the percentage of units with utilization in ten different "bins," from zero to 100 percent utilization. The data show that about 2/3 of transmission RICE units operate less than 50 percent of the time, with nearly 25 percent operating less than 10 percent of the time. For RICE at

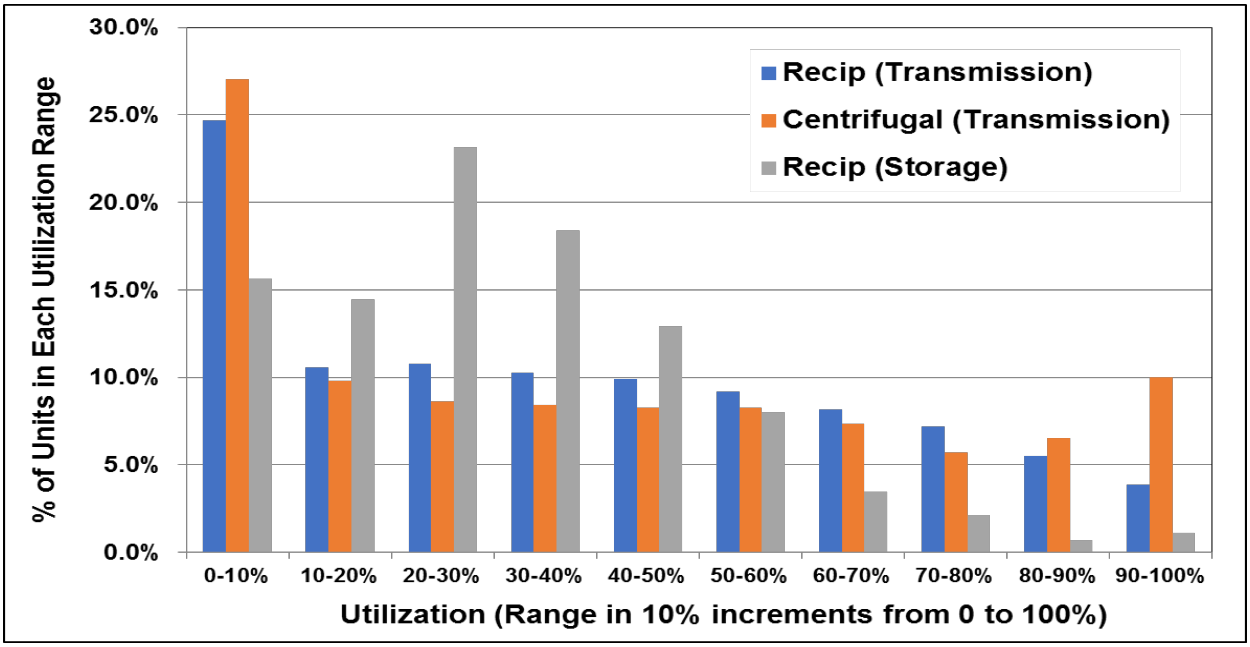
[32] It should be noted that sources within the industry cannot generally accept enforceable limitations on operations because FERC certificate requirements demand that these units be available to operate at capacities well-above typical operating conditions. These units nevertheless can effectively address emissions through the use of emissions averaging. *See* section IV for additional discussion.

[33] PRCI White Paper, "Use of Probabilistic Statistical Techniques for Estimating NOx Emissions from Infrequently Operated Emission Units," Catalogue No. PR-312-18208-E01 (Apr. 2020).

storage facilities, over 80 percent of the units operate less than 50 percent of the time. The GHGRP reporting threshold captures larger facilities with higher utilization because emissions from combustion are the driver that results in a facility exceeding the 25,000 metric ton reporting threshold. Thus, these data from GHGRP affected facilities *over-estimate* utilization for the entire population of RICE at natural gas transmission and storage facilities that will be impacted by the Proposed Rule.

Another important characteristic to understand for natural gas transmission compressor stations is that the smaller affected units (*e.g.*, those between 1,000 hp and 2,000 hp) are also more likely to be units that operate less frequently and thus have lower annual and ozone season emissions. A RICE compressor station typically includes several units, and, when demand is low, many or all units will be idle. Facility-specific cases differ, but typically the RICE with *lowest* utilization are the *smaller* affected RICE at the facility.

Figure 1. Histogram of RICE and turbine utilization at natural gas transmission and storage facilities subject to the federal GHGRP reporting program.



Since a 1,000 hp RICE must operate approximately 65 percent of the time or more to emit 100 TPY, and actual operation is much lower for the vast majority of such units, this characteristic utilization profile is the reason that significantly more units are affected by the proposed 1,000 hp threshold than a more reasonable threshold that considers actual emissions and/or unit utilization. If an hp threshold is used as a proxy to identify affected units, *i.e.*, those with 100 TPY or more of annual NOx emissions, utilization should be factored into that threshold.

In sum, more than five times[34] as many RICE units are affected than EPA estimated because characteristic natural gas transmission RICE utilization was not properly considered when defining the 1,000 hp threshold. This threshold therefore results in control of units EPA did not intend to regulate and emission reductions that are not needed to remedy significant contribution. EPA must, therefore, reevaluate the threshold and develop a proposal that better reflects the realities of the industry.

C. Estimates of State-Level NOx Reductions Demonstrate the Proposed Rule Requires Revision.

The comments above demonstrate the significant under-estimation of affected gas transmission RICE counts for states with non-EGU emissions reduction requirements. Based on an understanding of affected units, (average uncontrolled (or "under-controlled") emissions, typical utilization, and average size (hp) by unit type), the potential NOx reductions can be estimated for every state and compared to EPA estimates. The assumptions for this analysis are shown in Table 2.

[34] As noted above, based on INGAA member data, nearly five times as many units require NOx control or incremental control than EPA estimated. INGAA members account for about 80 percent of EPA's 307 units and the vast majority of the other 20% are in interstate natural gas transmission service. Thus, for gas transmission alone, the total count is likely more than 5 times EPA's estimate. Gathering and boosting could add many hundreds to more than a thousand additional units, significantly inflating the affected unit count relative to EPA's estimate.

Table 2. Assumptions by Engine Type for NOx Reduction Estimates by State

Engine Type	Uncontrolled NOx (g/bhp-hr)	% Reduction	"Under-Controlled" NOx (g/bhp-hr)	% Reduction	Avg HP	Utilization (%)
2SLB	16.8	82%	5.0	50	2,500	35%
4SLB	12.0	90%	4.0	65	2,700	25%
4SRB	11.0	94%	2.0	50	1,400	35%

These are relatively conservative assumptions. For example:

- The uncontrolled baseline for four-stroke engines may be higher.
- Assuming 82 percent control for 2SLB engines, which are the most prevalent units, while EPA typically assumes >95 percent control).
- Utilization may be higher than estimated.
- Average size (hp) of the units may be larger.[35]

A more detailed analysis with unit-specific data may result in larger NOx emission reductions for each state or at least some states. Based on INGAA member unit counts and these assumptions, the reductions by state are shown in Table 3. While EPA projects NOx reductions of 55,546 TPY for all covered states combined, INGAA's estimate indicates additional reductions in most states and total reductions of over 57,000 TPY more than EPA's estimate. This is more than double (203.4 percent) the reductions EPA estimates.[36]

[35] These factors also contribute to EPA-estimated emission reductions in some states exceeding estimates based on INGAA data, even though INGAA data show EPA under-counted units in those states (*see, e.g.*, Missouri and Oklahoma data in Table 3). For Oklahoma, EPA estimated reductions may be higher due to the average unit size (information is not complete, but Oklahoma units appear to be larger than the average from Table 2) and assumed control (82 percent assumed versus 97 percent assumption by EPA for 2SLBs). For Missouri, nearly all of the units appear to be 2SLB, so the assumed percent reduction differences (82 percent versus >95 percent in most cases) likely contributes to EPA estimating more reductions than a calculation based on the assumptions above. For the NOx SIP Call Phase 2 rule in 2004, natural gas transmission stakeholders, including INGAA, conducted very detailed analysis for all potentially affected units, which provided a clear understanding of the assumptions discussed above. That task would be a significant undertaking that cannot be completed within the comment period for the Proposed Rule. INGAA, however, offers its continuing assistance to help EPA better understand the inventory of equipment and associated emissions and reductions for this rulemaking.

[36] INGAA's estimate would be higher if a higher 4SLB engine baseline is assumed, higher control levels (*i.e.*, >95 percent control is commonly applied in EPA's estimate) are assumed, average size (hp) is larger than assumed, or if average utilization exceeds the assumed values shown in Table 2.

Table 3. Estimated emission reductions by state based on INGAA member unit counts and average assumptions for unit size, NOx baseline, and reduction.

State	EPA Unit Count	INGAA Unit Count: Uncontrolled	INGAA Count: Existing Control Insufficient	EPA NOx Reductions (TPY)	INGAA NOx Reductions	NOx Difference (TPY)	NOx TPY Overage (%)
AR	10	52	0	2,083	6,053	3,970	191%
CA	1	0	0	328	0	(328)	NA
IL	22	51	11	3,158	5,559	2,401	76%
IN	3	46	0	364	4,334	3,970	1092%
KY	17	121	0	5,497	9,665	4,168	76%
LA	45	191	13	9,395	11,485	2,090	22%
MD	1	0	0	107	0	(107)	NA
MI	21	95	0	5,452	9,071	3,619	66%
MN	9	37	0	1,340	4,077	2,737	204%
MS	25	218	7	3,784	19,954	16,680	427%
MO	22	32	0	3,793	3,004	(789)	-21%
NV	0	0	0	0	0	0	NA
NJ	0	0	8	0	136	136	NA
NY	2	12	17	254	1,385	1,131	444%
OH	25	79	19	2,875	9,197	6,322	220%
OK	32	38	1	6,717	3,828	(2,889)	-43%
PA	7	1	57	1,025	564	(461)	-45%
TX	26	70	45	4,167	8,105	3,938	95%
UT	4	10	0	569	867	298	52%
VA	9	25	0	1,922	2,864	942	49%
WV	20	87	0	1,803	9,030	7,227	401%
WI	0	11	0	0	1,142	1,142	NA
WY	6	23	3	912	2,646	1,734	190%
Total	307	1,199	181	55,546	112,967	57,421	203%

These estimates, which show more than double the emission reductions that EPA has proposed to determine would be a full remedy for any significant contribution to downwind nonattainment or maintenance issues for the pipeline transportation of natural gas sector, again

make clear that the basis for the Proposed Rule is so flawed that EPA must withdraw or substantially revise the proposal.

D. NOx Emissions, Potential NOx Reductions, and Cost Implications for Affected Units in Pennsylvania and Louisiana.

As noted previously, the comment period did not provide adequate time to complete unit-level analysis of emissions implications for all states, but a detailed analysis was conducted for two states with differing historical requirements, Pennsylvania and Louisiana, to provide EPA with additional detail and to further demonstrate that the factual basis on which EPA has relied is too flawed to reasonably form the basis for a proposed rule. In Louisiana, many gas transmission units are uncontrolled or only marginally controlled. In contrast, a Pennsylvania NOx RACT rule has resulted in installation of NOx controls on the majority of units, with some units not meeting the Proposed Rule limits due to marginally higher emission standards in Pennsylvania or unit-level compliance via emissions averaging or alternative RACT.

For Louisiana units:

- EPA estimates that there are 45 affected units, but INGAA member data indicate there are 204 units that would require control, and most of the units are currently uncontrolled (191 of 204).

- However, many units exhibit very low utilization, so actual annual NOx emissions are well below 100 TPY. **Actual utilization for the 204 units was approximately 23%** of potential operations (*i.e.*, based on annual hp-hours). This is indicative of "actual emissions" less than 100 TPY for most units, as compared to the 1,000 hp applicability threshold that assumes utilization more than three times higher.

- EPA estimates **9,395 TPY** of NOx emission reductions from the 45 units with an uncontrolled baseline of 9,823 TPY, which is equivalent to 95.6 percent reduction on average.

- Based on INGAA member data and more realistic average reductions, NOx reductions are estimated at approximately **11,485, TPY**. If EPA's assumption is used (95.6 percent average reduction), NOx reductions are **14,105 TPY**.

- Note that these reductions include nominal amounts for many units with very little operating time. **Over 77 percent of the units operated less than 40 percent of the time.**

- The estimated cost for retrofitting 192 uncontrolled units in Louisiana likely exceeds $400 million. The types and sizes of units in Louisiana are similar to the full fleet of gas transmission RICE affected, so extrapolating this to 1,199 uncontrolled units (*see* Table 3) indicates a total capital cost of $3 billion or more for RICE affected by the Proposed Rule operated by INGAA members.

For Pennsylvania units:

- EPA estimates seven affected units in Pennsylvania, achieving **1,025 TPY of NOx reductions** based on 95.4 percent average control.

- Pennsylvania units include emissions control, but INGAA member data indicate there are 57 units with emissions marginally above the proposed standards (*e.g.*, 2–5 g/bhp-hr) that would require additional capital expenditure to further reduce NOx to meet the proposed standards. One unit is uncontrolled but will likely be installing controls to meet an update to Pennsylvania's NOx RACT rule.

- **Actual utilization for the 58 units was approximately 34 percent** of potential operations on an annual hp-hour basis. Because the units include NOx control and utilization is relatively low, actual emissions are less than 100 TPY for all units but one.

- EPA estimates **1,025 TPY** of NOx emission reductions from the 7 units with an uncontrolled baseline of 1,077 TPY, which is equivalent to 95.4 percent reduction on average.

- Based on INGAA member data, NOx reductions are estimated at approximately **611 TPY** with an average emission reduction of about 47 percent.

  - Note that these reductions include nominal amounts for units that already include emission controls. In addition, about 40 percent of the units operated less than 40 percent of the time.

III. Without Appropriate Revisions, the Proposed Rule Will Result in Unlawful Over-Control of the Pipeline Transportation of Natural Gas Sector.

The U.S. Supreme Court has made clear that EPA has an obligation to avoid "over-control" of upwind sources when it chooses to regulate pursuant to the good neighbor provision of the CAA to address interstate transport and downwind nonattainment or interference with

maintenance.[37] That means that upwind states cannot be required to reduce their emissions below their levels of significant contribution to downwind nonattainment. In other words, all of the work to achieve attainment with the NAAQS cannot be left to upwind states. Downwind states must do their part as well.

The Supreme Court's ruling in *EME Homer II* provided EPA with some leeway to address the over-control issue. It noted that while EPA has a statutory duty to avoid over-control, the Agency also has a statutory obligation to avoid "under-control," *i.e.,* to maximize achievement of attainment downwind. The Court explained that:

> a degree of imprecision is inevitable in tackling the problem of interstate air pollution. Slight changes in wind patterns or energy consumption, for example, may vary downwind air quality in ways EPA might not have anticipated. The Good Neighbor Provision requires EPA to seek downwind attainment of NAAQS notwithstanding the uncertainties. Hence, some amount of over-control, *i.e.,* emission budgets that turn out to be more demanding than necessary, would not be surprising. Required to balance the possibilities of under-control and over-control, EPA must have leeway in fulfilling its statutory mandate.[38]

This "leeway" the Supreme Court explained, might allow EPA to require emissions reductions in an upwind state that could result in over-control relative to a downwind receptor in one state so long as those upwind reductions were still necessary to eliminate significant contribution at another receptor in another state. This sort of incidental over-control, the Supreme Court held, might still be consistent with the CAA's good neighbor provision. What would clearly be impermissible, the Court held, is an interstate transport rule that "requires an upwind State to reduce emissions by more than the amount necessary to achieve attainment in *every* downwind State to which it is linked."[39] Between these two extremes identified by the

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[37] *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489, 523 (2014) ("*EME Homer II*").

[38] *Id*.

[39] *Id*.

Supreme Court, the record that EPA develops to support an interstate transport rule must certainly provide a legitimate basis for concluding that the Agency has struck a reasonable balance between potential over- and under-control, and that EPA has rational reasons for concluding that its rule will not result in either unlawful outcome. The Proposed Rule here does not appropriately strike that balance for natural gas transportation pipelines.

A. INGAA's Analysis Demonstrates the Proposed Rule Would Over-Control the Pipeline Transportation of Natural Gas Sector.

As demonstrated in section II above, EPA's Proposed Rule would require significantly more emission reductions on a national and a state-by-state basis than the Agency has assumed. On a national basis, EPA has calculated that its Proposed Rule would result in 55,546 TPY of NOx reductions from the pipeline transportation of natural gas sector. INGAA's analysis shows that the Proposed Rule would result in NOx reductions of at least approximately 112,967 TPY. EPA's national NOx reduction estimate is, therefore, off by *at least* an approximate 57,421 TPY. If EPA believes, as it must, that national NOx emission reductions on the order of 55,546 TPY are necessary to address the significant contribution of the pipeline industry in the 23 states covered by the non-EGU provisions of the Proposed Rule, then surely a rule that would result in reductions more than twice that amount would result in over-control.

The state-by-state estimates provided above further confirm that the Proposed Rule would result in over-control with respect to the natural gas pipeline transportation industry. Of the 23 states included in the non-EGU program, four states (California, Maryland, Nevada, and New Jersey) have very limited data, or no units owned or operated by INGAA members. INGAA has therefore not further evaluated them. Of the remaining 19 states, INGAA's analysis shows that 16 would be subjected to NOx emission reductions that are higher—in many cases

substantially higher—than EPA has estimated the Proposed Rule would require.[40] The overages range from 22 percent to 1,092 percent, with nine of the overages over 100 percent. This is not incidental over-control that results by virtue of an upwind state being linked to more than one downwind state. This over-control has resulted from EPA's pervasive misunderstanding of the fundamental attributes of the natural gas pipeline transportation sector.

The conclusion that the Proposed Rule would result in over-control is not simply based on the sizeable difference between EPA's estimated emission reductions and the emission reductions that INGAA projects based on its more complete and accurate data. The CAA requires EPA, when acting pursuant to the good neighbor provision, to clearly identify "significant contribution" in terms of overall emission reductions that sources and states must achieve.[41] EPA does this by applying a cost-effective control analysis to the sources it chooses to regulate.[42] That analysis for this Proposed Rule identified a level of significant contribution from the pipeline transportation of natural gas sector consistent with national emission reductions of 55,546 TPY and state-by-state emission reductions calculated by EPA as set forth in Table 3 above. Flaws in the record have caused EPA to inadvertently propose to pull in sources and require emission reductions far in excess of what the Agency believes amounts to significant contribution. That is over-control, and eliminating it by revising the Proposed Rule will help

[40] Three states—Missouri, Oklahoma, and Pennsylvania—are expected to achieve fewer emission reductions than EPA has projected. INGAA's analysis shows EPA has estimated reduction overages of 37, 29, and 45 percent, respectively. As explained above, this is almost certainly due to a combination of factors, including that the sources in these states are either controlled pursuant to RACT and differences in unit-type and size. *See* footnote 35 above.

[41] *North Carolina v. EPA*, 531 F.3d 896, 908 (D.C. Cir. 2008) ("It is unclear how EPA can assure that the trading programs it has designed … will achieve section 110(a)(2)(D)(i)(I)'s goals if we do not know what each upwind state's 'significant contribution' is to another state.").

[42] *See, e.g.*, 87 Fed. Reg. at 20,055.

EPA achieve the emission reductions that are warranted without undue hardship on industry and protracted legal battles over these issues.

B. Additional Considerations Do Not Undercut the Conclusion that the Proposed Rule Would Result in Over-Control.

It is also important to emphasize that EPA's underestimation of affected units and emission reductions does not stem from a misunderstanding of the pipeline transportation of natural gas sector's overall NOx emissions. On the contrary, EPA's national emissions inventory for the source category is complete. As explained above, the primary reason that the Proposed Rule would control more sources and result in more reductions than EPA expected is the Agency's lack of information on unit utilization and the Proposed Rule's flawed applicability threshold. The Agency does know exactly how many NOx emissions are at issue and what emission reductions (approximately 55,546 TPY) may be needed to address significant contribution.

Additionally, the over-control analysis presented in the Proposed Rule does not adequately address the issue and cannot counter the conclusion that the pipeline transportation of natural gas sector would be over-controlled under the Proposed Rule. EPA's analysis looks only at the emission reductions it has assumed. Because the record for the pipeline transportation of natural gas sector is so flawed, it does not speak to the actual effects of the proposal in the real world.

It is also important to discuss the manner in which the courts have previously addressed over-control issues. In *EME Homer II*, the Supreme Court determined that potential over-control did not warrant invalidation of a good neighbor rule "on its face" and that instead it was appropriate to contest over-control of individual upwind states in "particularized, as-applied

challenge[s]."[43] While that was the appropriate remedy for the rule in question in that earlier litigation, it is not the necessary or appropriate approach here. In particular, state-specific, as-applied challenges were needed during the previous round of transport rule litigation because the petitioners there argued only that EPA's methodology for devising state budgets, using uniform emission control costs to select reasonable controls and to model budgets that reflect the installation and operation of those controls, had the *potential* to result in over-control.[44] Here, EPA has identified tonnage reductions from the pipeline transportation of natural gas sector that it believes will address the industry's significant contribution to downwind nonattainment, but inadvertently proposed requirements that would impose vastly larger reduction requirements. There is not just potential for over-control, as there was under previous versions of CSAPR. Over-control is guaranteed. As such, state-by-state as applied challenges are not necessary to demonstrate over-control.[45]

Finally, EPA should consider that the controls to be installed to comply with the Proposed Rule would operate year-round, not just during the ozone season. Although the Proposed Rule is concerned with ozone season reductions and those are the reductions needed to address significant contribution, EPA should acknowledge that the rule will result in additional reductions, and the Agency could find some manner to credit the sector for those additional reductions.

Because EPA's Proposed Rule will result in unlawful over-control, INGAA requests that the Agency reevaluate the control requirements it has proposed. One approach that could address

[43] *EME Homer II*, 572 U.S. at 524.

[44] *EME Homer III*, 795 F.3d at 126.

[45] A particularized as-applied challenge is appropriate "for challengers who raise the possibility of overcontrol in only a few instances," where petitioners "speculate" that EPA's methodology could lead to over-control. *Wisconsin v. Env't Prot. Agency*, 938 F.3d 303, 325 (D.C. Cir. 2019).

the issue of over-control would be raising the hp threshold for the Proposed Rule's applicability. Taking this approach, EPA could more effectively target those uncontrolled sources that emit more than 100 TPY. Determining an appropriate threshold with precision could involve additional technical analysis, and INGAA would be happy to assist EPA in that effort. Whichever approach EPA ultimately chooses, INGAA encourages the Agency to work collaboratively with the industry to identify regulatory requirements that will achieve meaningful environmental benefits consistent with EPA's legal obligation to address significant contribution without improper over-control.

IV. The Proposed Rule Should Be Revised to Provide Cost-Effective and Environmentally Sound Compliance Flexibility Consistent with Other EPA and State Regulatory Policies.

Because eliminating the significant contributions of upwind state sources to downwind state nonattainment and interference with maintenance poses many challenges, EPA has consistently sought to provide sources as much flexibility as possible. For electric utilities, EPA has consistently acknowledged the need to provide flexibility through emission allowance trading programs to address interstate transport.[46] For the natural gas pipeline transportation sector, EPA has historically provided regulatory flexibility through emissions averaging.[47] EPA should take that approach here.

[46] EPA adopted a trading program approach in the 1998 NOx SIP Call, 2005 Clean Air Interstate Rule ("CAIR"), 2011 Cross-State Air Pollution Rule, 2016 CSAPR Update, the 2018 CSAPR Closeout, and it is the approach EPA has proposed for EGU provisions of the Proposed Rule.

[47] INGAA supports EPA's decision to separate the EGU and natural gas transportation programs. EPA identified reasons (lack of data, lack of CEMS) for not including the natural gas pipeline industry in the EGU trading program. INGAA agrees that incorporating the pipeline transportation of natural gas industry into the EGU program would be unnecessarily complicated. Nevertheless, INGAA believes other forms of flexibility are necessary and that they would enhance the environmental benefits of the program.

A. EPA Precedent Supports Use of Averaging.

If EPA moves forward with the Proposed Rule, INGAA recommends EPA adopt emissions averaging, as it did in the NOx SIP Call Phase 2 rule, which demonstrated real and lasting emission reductions in an efficient manner. Starting in 1998, EPA's NOx SIP Call rule included control requirements for large stationary internal combustion engines.[48] INGAA challenged aspects of the 1998 NOx SIP Call, and the D.C. Circuit remanded the 1998 NOx SIP Call to EPA with respect to INGAA's challenge.[49]

In response to the court's decision and in support of EPA's action on remand, INGAA engaged in extensive discussions with the Agency to help design the elements of a replacement rulemaking. That resulted in the development of the 2004 NOx SIP Call Phase 2 rule. There, EPA evaluated and came to support reliance on emissions averaging for RICE in the natural gas pipeline sector as a reasonable compliance flexibility mechanism. The Phase 2 rule, like the Proposed Rule, was developed to address the interstate transport of ozone and required 21 states and the District of Columbia to eliminate NOx emissions that contributed significantly to downwind nonattainment of the 1-hour ozone standard. As such, the emissions averaging provisions used to implement the Phase 2 NOx SIP Call rule are particularly relevant to implementation of the Proposed Rule.

EPA first addressed in detail the issue of emissions averaging for the purpose of addressing interstate transport in an August 22, 2002 guidance memorandum[50] that was intended to help states developing SIPs respond to NOx SIP Call. The memo says that "[w]here states

[48] 63 Fed. Reg. 57,356 (Oct. 27, 1998).

[49] *See Michigan v. EPA*, 213 F.3d 663, 693, 695 (D.C. Cir. 2000).

[50] Memorandum from Lydia N. Wegman, "State Implementation Plan (SIP) Call for Reducing Nitrogen Oxides (NOx) – Stationary Reciprocating Internal Combustion Engines" (Aug. 22, 2002) ("Wegman Memo").

choose to regulate large IC engines, EPA encourages states to allow owners and operators of large IC engines the flexibility to achieve the NOx ton/season reductions" by using a variety of control technologies, noting that while control technologies are known to have "a specific average control effectiveness for an engine population, some individual engines that install the controls would be expected to be above and some below that average control level, simply because it is an average."[51] For that reason, EPA stated:

> During the SIP development process the States may establish a *NOx tons/season emissions decrease target for individual companies and then provide the companies with the opportunity to develop a plan that would achieve the needed emissions reductions*. The companies may select from a variety of control measures to apply at their various emission units in the State or portion of the State affected under the NOx SIP call. These control measures would be adopted as part of the SIP and must yield enforceable and demonstrable reductions equal to the NOx tons/season reductions required by the State. *What is important from EPA's perspective is that the State, through a SIP revision, demonstrate that all the control measures contained in the SIP are collectively adequate to provide for compliance with the State's NOx budget during the 2007 ozone season*.[52]

Accordingly, in one of EPA's earliest rulemakings to address interstate transport for the ozone NAAQS, the Agency embraced emissions averaging for RICE on an individual company basis. In its 2004 final rule for the Phase 2 NOx SIP Call, EPA adopted the position stated in the Wegman memo, using almost exactly the same language.[53] As described in the final Phase 2 rule, commenters on the proposal provided additional well-reasoned rationales for allowing RICE to use emissions averaging for purposes of meeting their interstate transport obligations. The commenters noted the following benefits of company-specific emissions averaging:

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[51] *Id*. at 1.

[52] *Id*. at 2 (emphases added).

[53] 69 Fed. Reg. 21,604, 21,621 (Apr. 21, 2004).

- Engine owners and operators would accept enforceable and verifiable measures to control engines to meet assigned NOx SIP Call reductions.

- Based on the company compliance plans, States would be able to clearly demonstrate their compliance with Phase II of the NOx SIP Call.

- The EPA, States, and regulated companies would not have to work through the technical confusion of definitions of lean-burn and rich-burn engines and whether individual engines could in fact achieve certain control levels with a prescribed control technology.

- Compliance with NOx SIP Call requirements could be achieved with minimum impacts on cost, natural gas capacity, and operational reliability.[54]

In furtherance of these goals and to encourage states to adopt SIPs that incorporated emissions averaging for RICE, EPA developed a model rule that states could adopt as part of their SIPs. The model rule was focused on compliance with the rule's emission reduction requirements by 2007 and was based on a "Facility Seasonal NOx 2007 Tonnage Reduction," which EPA defined as "the total of the Engine Seasonal NOx 2007 Tonnage Reductions attributable to all of an owner/operator's Large NOx SIP Call Engines," *i.e.*, the engines subject to the rule's requirements.[55]

As suggested by the language included in the preamble to final Phase 2 rule, the model rule was based on a compliance plan approach. These compliance plans "must demonstrate enforceable emission reductions from one or more stationary internal combustion engines equal to or higher than the Facility Seasonal NOx 2007 Tonnage Reduction."[56] The plan "may cover some or all engines at an individual facility or at several facilities or at all facilities in a State that are in control of the same owner/operator."[57] Interestingly, the model rule allowed facility

[54] *Id*.

[55] Model Rule § 1(c).

[56] *Id*. § 3(a)(2).

[57] *Id*. § 3(a)(3).

owners to get credit for emission reductions from engines subject to the rule and from other engines:

> The compliance plan may include credit for decreases in NOx emissions from Large NOx SIP Call Engines in the State due to NOx control equipment. Credit may also be included for decreases in NOx emissions from other engines in the State due to NOx control equipment not reflected in the 2007 Ozone Season Base NOx Emissions in the NOx SIP Call Engine Inventory.[58]

Finally, the compliance plan had to include "[a] numerical demonstration that the emission reductions obtained from all engines included under the plan will be equivalent to or greater than the owner/operator's Facility Seasonal NOx 2007 Tonnage Reduction, based on the difference between the Past NOx Emission Rate and the Projected NOx Emission Rate multiplied by the Projected Operating Hours for each Affected Engine."[59]

Since the emissions averaging approach adopted in the NOx SIP Call Phase 2 rule has been demonstrated to achieve real and lasting emission reductions in an efficient manner, state environmental regulatory bodies have adopted similar regulatory approaches. Texas, for instance, has allowed emissions averaging to demonstrate compliance with its emission reduction requirements for grandfathered RICE located in West and East Texas. Those rules generally require each affected engine in East Texas to achieve at least a 50 percent reduction of the hourly emissions rate of NOx and affected engines in West Texas to achieve up to a 20 percent reduction of the hourly emissions rate of NOx.[60] The rules further provide, however, that "the owner or operator of more than one grandfathered reciprocating internal combustion engine may average the reductions achieved among more than one reciprocating internal combustion engine

[58] *Id*. § 3(a)(5).

[59] *Id*. § 3(a)(6)(v).

[60] 30 TAC § 116.779 (b)(1), (2).

connected to or part of a gathering or transmission pipeline in order to demonstrate" the required reductions.[61] The Texas rules even allow averaging across engines located in both East and West Texas so long as the owner or operator demonstrates that "the sum of the reductions achieved from all of the engines located in the East Texas region as defined in §101.330 of this title will achieve the reductions" required of such units.[62]

Pennsylvania has also adopted emissions averaging provisions to address NOx and volatile organic compounds ("VOCs") for purposes of RACT, and EPA has approved those provisions.[63] The Pennsylvania rules provide source-specific RACT determinations or alternative NOx emissions limits for sources at 23 major NOx and VOC emitting facilities within the state to address the 1997 and 2008 8-hour ozone NAAQS. The alternative NOx emission limits include facility-wide or system-wide NOx emissions averaging plans. To assess the effectiveness of averaging, Pennsylvania conducted an evaluation of aggregate NOx emissions emitted by the sources included in the facility-wide or system-wide NOx emissions averaging plan. The state concluded, and EPA agreed, that those emission reductions under the averaging plans would be equivalent to emissions if the individual sources were operating in accordance with the applicable presumptive limit. Accordingly, EPA determined that the averaging plan was consistent with all applicable laws and regulations and approved the plan.

These states are not outliers. On the contrary, a range of geographically diverse states have adopted emissions averaging based on EPA's model rule for control of RICE NOx emissions. Illinois, for instance, allows owners and operators of affected RICE units to comply

[61] *Id*. § 116.779 (b)(3).

[62] *Id*.

[63] *See* 87 Fed. Reg. 3,929 (Jan. 26, 2022).

with NOx emission limits through an emissions averaging plan.[64] The rule provides equations by which owners and operators must demonstrate that total mass of actual NOx emissions from the units listed in the emissions averaging plan are equal to or less than the total mass of allowable NOx emissions for those units for both the ozone season and calendar year.

New York has also adopted emissions averaging rules.[65] New York's rules require emissions averaging plans to employ a weighted average permissible emission rate and include provisions for adjusting the weighted average to address forced outages. The state's rules also prohibit averaging of emissions from sources within the severe ozone nonattainment area with those outside the severe ozone nonattainment area.

Ohio has adopted similar regulations authorizing owners and operators of affected RICE to comply with NOx emission standards through EPA-approved emissions averaging plans.[66] Ohio's rules require that emission reductions counted under such a plan be "real, quantifiable and enforceable and … in excess of any state or federal requirements."[67] The rules further provide that those emission reductions must be equal to or greater than the actual emission reductions that would be required under Ohio's rules if an emissions averaging program were not employed. Further, Ohio allows an owner or operator to take credit for emission reductions resulting from a unit shutdown only if the owner or operator can demonstrate that "the shutdown does not correspond to load-shifting or other activity which results in or could result in an

[64] Ill. Admin. Code tit. 35, § 217.390.

[65] 6 NYCRR 227-2.5(b).

[66] Ohio Admin. Code 3745-110-03(I).

[67] *Id.*

equivalent or greater emission increase and that the reduction accounts for any increase in NOx emissions from other sources as a result of the shutdown."[68]

Finally, in addition to EPA's model rule, the Ozone Transport Commission ("OTC") has developed its own NOx RACT technical guidelines for RICE used in natural gas transmission.[69] The OTC guidelines provide emission rate limits that would apply to various types and sizes of RICE. They also include provisions that would authorize emissions averaging for multiple natural gas-fueled units that are under the control of a common owner or operator at a single facility to achieve the same level of NOx reductions that would be achieved if all of the units at the location met the applicable NOx emissions limitations of the guidelines.[70] As EPA has relied on OTC model rules to establish the emission rate limits proposed in this Proposed Rule, EPA should likewise adopt emission averaging as a compliance measure based on OTC approval of that approach.

B. Averaging Will Help to Address Otherwise Insurmountable Obstacles to Compliance with the Proposed Rule.

EPA has proposed to require non-EGU sources to comply with the Proposed Rule's emission limits beginning in 2026. As explained in section V of these comments, INGAA does not believe EPA has established record support for the feasibility of a 2026 compliance deadline. Indeed, there is no realistic pathway to retrofitting every affected unit with the controls necessary to meet EPA's proposed emission limits. The compliance deadline is not, however, the only practical impediment to compliance for INGAA members. Units of certain vintages and units

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[68] *Id*. at 3745-110-03(I)(1)(e).

[69] OTC, "OTC Regulatory and Technical Guideline for Control of Nitrogen Oxides (NOx) Emissions from Natural Gas Pipeline Compressor Fuel- Fired Prime Movers," (May 14, 2019), available at https://otcair.org/upload/Documents/Model%20Rules/OTC_RegAndTechGuideline_NGPipelineCompressorPrimeMovers_TechFeasibility_CostEffectivenessAnalysis_Final_05142019.pdf.

[70] *Id*. at 5.1.2.

from certain manufacturers will not be able to meet the emission rate limits EPA has proposed. Absent a system based on source-specific emission limits, emissions averaging is one of the only practical mechanisms for addressing these challenges. Even with emissions averaging, absent additional changes to the Proposed Rule, compliance challenges will remain. Nevertheless, what is clear is that compliance without averaging will be impossible.

As the D.C. Circuit has explained, "impossibility" is a key concept under the good neighbor provision of the CAA.[71] EPA is obligated to align its interstate transport emission reduction requirements with the next applicable NAAQS attainment date unless doing so is "impossible." Just as EPA is obligated to provide sources with adequate time to achieve the emission reductions necessary to address significant contribution, EPA must provide adequate regulatory tools and safety valves to ensure that affected sources can comply with the Agency's rules.

V. EPA Has Underestimated the Length of Time Necessary to Retrofit Existing Units.

As EPA has acknowledged in past rulemakings where it has considered addressing interstate transport of ozone by including emission reduction requirements for RICE in the natural gas pipeline industry, significant time and resources are needed for acquiring control technologies, hiring the labor required for retrofits, obtaining needed permits, and managing the timing for staggering retrofits.[72] The Proposed Rule includes a compliance timeframe that cannot be reconciled with EPA's past positions and that the industry cannot meet under current conditions. INGAA's comments advocate for a number of changes to the Proposed Rule, all of

[71] *Wisconsin*, 938 F.3d at 320; *New York v. EPA*, 781 Fed. App'x 4, 7 (D.C. Cir. 2019).

[72] *See, e.g.*, U.S. EPA Office of Air and Radiation, Technical Support Document for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS: Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance at 21; Docket ID No. EPA-HQ-OAR-2015-0500 (November 2015) (hereinafter "Non-EGU NOx Emission Controls TSD").

which would help to improve the feasibility of NOx regulation for affected units. Those changes include:

- Revising the Proposed Rule to regulate a number of units that would achieve emission reductions consistent with the level of control needed to address the significant contribution of the industry to downwind nonattainment and maintenance issues
- Preventing unlawful over-control
- Allowing the use of emissions averaging as a compliance tool for affected units
- Responsibly addressing regulatory costs and reliability impacts

Even with these changes, compliance with a well-designed and reasonable rule to address interstate transport of NOx is almost certainly impossible for the interstate natural gas pipeline industry to achieve by 2026. This section of INGAA's comments explains why that is the case and the nature of the constraints that will limit the installation or modification of controls on RICE that would be affected by the Proposed Rule. As described below, for these reasons, INGAA suggests that EPA generally consider a phased approach to compliance with any NOx standards that it promulgates for the industry.

In a 2014 analysis[73] prepared for the INGAA Foundation, Inc. and submitted to EPA as part of rulemaking docket for its 2014 CSAPR "Close-out" rule,[74] Innovative Environmental Solutions, Inc. & Optimized Technical Solutions evaluated "the resources required of the operating companies, emission reduction suppliers, engineering service providers, and contractors to implement NOx control regulations for low speed reciprocating engines used in the interstate natural gas transportation industry" and concluded that "the projected time to

[73] Innovative Environmental Solutions, Inc. & Optimized Technical Solutions, "Availability and Limitations of NOx Emission Control Resources for Natural Gas-Fired Reciprocating Engine Prime Movers Used in the Interstate Natural Gas Transmission Industry," (July 2014) ("Control Availability Report").

[74] 83 Fed. Reg. 31,915 (July 10, 2018).

implement retrofit NOx control (or replacement) is far in excess of typical regulatory schedules."[75] The report is extremely relevant to the current rulemaking. It evaluates the same emission control technologies, including Low Emission Combustion ("LEC"), nonselective catalytic reduction ("NSCR"), and selective catalytic reductions ("SCR") that continue to be the basis for the emission rates proposed by EPA to address interstate transport for the 2015 ozone NAAQS.[76] The report also contains a review of the various types and numbers of RICE inventoried at the time.[77] The report's evaluation of potential regulatory drivers includes a new regional rule to address interstate transport comparable to but more stringent than the 2004 Phase 2 NOx SIP Call, precisely what the Proposed Rule is, and it specifically considers potential impacts (including "a broad regional NOx control rule") of a 2015 ozone NAAQS set in a range from 60 to 70 parts per billion ("ppb"), accurately reflecting the current regulatory landscape.[78] It also evaluated available resources and the cost and schedule to install controls based on NOx endpoints of 3 g/bhp-hr or 1 g/hp-hr, consistent with the limits EPA has now proposed.[79]

After reviewing this fundamental information, the report provides an assessment of resource constraints associated with NOx control retrofits. In doing so, it provides relevant examples, such as the conversion of 200 natural gas transmission units to LEC starting in 1999 as part of the NOx SIP Call. The report finds "[f]rom interviews with the operators and the emission reduction equipment suppliers, the conversion process took six years in total to fully implement."[80] The report further concludes that, generally, "[b]ased on interviews with pipeline

[75] Control Availability Report at 1.

[76] *Id*. at 6-9.

[77] *Id*. at 10-18.

[78] *Id*. at 18-19.

[79] *Id*. at 21.

[80] *Id*. at 27.

operations and emission reduction equipment suppliers having experience with previous conversion projects, NOx control for each engine requires between 1 and 2 ½ years to complete (from inception to completion of commissioning)" with older engines and retrofits requiring more infrastructure modifications taking additional time.[81] Most importantly for purposes of a broadly applicable rule like the Proposed Rule, "[t]aking into account both the lead time and conversion time and based on currently available resources (i.e., trained personnel), the average number of units that can be modified to lean combustion on a sustained basis is *approximately 75 engines per year*."[82] The report's conclusion in this regard is based on what it calls current resource availability, but it acknowledges that "a dramatic increase in market demand would likely result in hiring and training of additional resources."[83] Nevertheless, "the special skills associated with this niche market would require time to build that resource."[84]

To retrofit RICE to meet a 3 g/hp-hr standard, the report estimates that "[b]ased on current technical resources, the projected time to implement retrofit NOx control (or replacement) is far in excess of typical regulatory schedules[, and] that it would take decades to address NOx controls for a large number of engines, even if the annual rate of retrofit conversions is doubled."[85] Retrofitting a smaller number of engines to achieve a 1g/hp-hr standard, the report concludes, would have a minimal impact on schedule, but would have "a significant cost impact, with engine-specific costs on average about 65% higher to achieve 1 g/hp-hr."[86]

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[81] *Id*.

[82] *Id*. (emphasis in original).

[83] *Id*.

[84] *Id*.

[85] *Id*. at 29.

[86] *Id*.

The market for expert services needed to conduct the retrofits that would be required by the Proposed Rule has not improved in any substantial way since the preparation of the Control Availability Report. EPA's own estimate that covered RICE can install controls by the 2026 ozone season is undermined by the Agency's substantial underestimation of affected units, as described in section II of these comments. For the existing equipment in natural gas transmission, there is a limit of qualified service providers that support control implementation. Factors to be considered include service provider and equipment availability (which is limited), access to multiple vendors that serve the supply chain, budget cycles and lead time for procuring equipment, consideration of control installation downtime requirements of about one month for each unit serviced, operating constraints that limit out-of-service equipment, and timing for permitting. Further, current supply chain issues affecting the economy as a whole will undoubtedly result in further delays in performing necessary retrofits.

In addition, there are permitting constraints that will significantly expand the timeframe for completing retrofits required by the Proposed Rule. Due to the workload of the permitting agencies, the permitting process typically takes six to fifteen months to complete. In some cases, the process can take longer depending on the complexity of the project. With a rule that envisions permitting requirements as broadly applicable as the Proposed Rule's, significant delays and resource constraints are likely to add additional delays to the process.

EPA's proposal also does not take into account that pipelines that choose to replace RICE units with new units must seek permitting approval from various federal agencies, including the Federal Energy Regulatory Commission ("FERC") should they either increase the hp of the unit or need to seek a new or temporary right-of-way for construction. A pipeline that wishes to increase its hp must seek a certificate of public convenience and necessity from FERC under

section 7 of the Natural Gas Act. It must also obtain various environmental permits from permitting agencies, such as U.S. Army Corps of Engineers, EPA, and the Department of Interior's Fish and Wildlife Service, and submit for safety review by the Department of Transportation's Pipeline and Hazardous Materials Safety Administration. The FERC timeline for reviewing—assuming it must go through a National Environmental Policy Act review—will take at a minimum 1 ½ years. EPA's proposal is likely to prompt a sudden, substantial increase in the number of certificate or permit applications submitted to the government for review if owners and operators determine that retrofitting affected units will require the expansion of facility footprints or if other similar action will be necessary. This increase in turn could further lengthen the review period by straining the resources of federal agencies. The review period also could take longer if the compressor is sited in a densely populated area or there are protests associated with the project.

As one measure to address potential compliance deadline bottlenecks and other complications, EPA has asked for comment on a case-by-case extension process for non-EGU sources. The Agency has asked for specific criteria by which it should judge such requests and on the process for reviewing and acting on such requests. A flexible and timely approach for addressing case-by-case compliance deadline extensions is an important backstop measure that could be of significant use to industry and permitting authorities when circumstances demand it. To that end, INGAA supports adoption of a process substantially similar to the approach used to determine RACT for individual sources. EPA could implement such a process pursuant to its FIP, but also could make clear in its final rule that states could submit simple SIPs to take over this process from EPA.

It is unclear from EPA's proposal whether the Agency envisions making these determinations itself or delegating these sorts of decisions to the states. INGAA generally supports allowing states to take over the process for making source-by-source determinations, given their experience and expertise in overseeing such determinations. EPA should make clear in any final rule that it encourages states to take such action. To assist states in taking control of these interstate transport provisions, EPA should clearly state the emission reduction targets that it believes are needed to address significant contribution. EPA should also make clear, consistent with governing case law, that states are free to determine the means used to achieve emission reductions and that states may choose alternative approaches to the emission limits EPA has proposed in its FIP.[87]

In addition, INGAA suggests that upon submittal of a complete application for a case-by-case deadline extension determination, the final rule provide for an automatic tolling of the relevant compliance date or dates that would be commensurate with the time taken by EPA (or other decisionmakers) to make a final determination regarding the extension. Such a provision would confer a necessary level of certainty for regulated sources to make effective use of any extension provision.

INGAA supports EPA adopting the most flexible process possible for making such requests, as cost, technical, or issues or other constraints could arise at any time leading up to the Proposed Rule's general compliance deadline. Accordingly, INGAA does not recommend that EPA establish a hard cutoff date for submittal of case-by-case extension requests. EPA should

[87] *Michigan v. EPA*, 213 F.3d 663, 686 (D.C. Cir. 2000), *cert. denied*, 121 S. Ct. 1225 (2001) (noting that in the NOx SIP Call "EPA calculated the budgets using highly cost-effective emission controls, [but] the agency allows the states to choose the control measures necessary to bring their emissions within the budget requirements").

judge any such request on the merits of the issues that have arisen, including whether the issues were brought to EPA's attention in a timely manner.

Even if EPA adopts a case-by-case extension provision, INGAA nevertheless believes, as stated above, that the interstate natural gas pipeline industry requires a more comprehensive and universally applicable phased compliance schedule for any rule that EPA is likely to develop. How long that phased compliance schedule will need to be will depend on the number of units that are ultimately subject to the rule and key features of the rule. INGAA is prepared to work with EPA to help design a compliance program that will be reasonable and successful. What is clear, however, is that the proposed compliance deadline in 2026 is not possible for the industry.[88]

As noted above, impossibility is a key legal standard that the courts have identified as controlling EPA's discretion to establish compliance deadlines under the good neighbor provision. Generally, EPA's interstate transport rules must include compliance deadlines for upwind states that will ensure implementation of upwind state obligations by the next applicable

[88] EPA suggests in the Proposed Rule that affected units have been given additional notice by virtue of the Proposed Rule's availability and that this additional time further supports the 2026 compliance deadline for non-EGUs that would be subject to the Proposed Rule. 87 Fed. Reg. at 20,101 ("the publication of this proposal provides roughly an additional year of notice to these source owners and operators that they should begin engineering and financial planning now to be prepared to meet this implementation timetable"). EPA should acknowledge that owners and operators of potentially affected units cannot realistically plan for compliance with provisions of a Proposed Rule that is likely to change as a result of the rulemaking process and that the proposal of a new regulation will not alter the market constraints, permitting bottlenecks, and similar issues that will all determine the timeframe in which compliance with a final rule will be possible. As a legal matter, moreover, the courts have recognized that regulated parties must have fair notice of what will actually be required of them and the time necessary to comply. A proposed rule does not provide adequate assurance of what will ultimately be required. *See, e.g., FCC v. Fox Television Stations, Inc.*, 132 S. Ct. 2307, 2317 (2012) ("A fundamental principle in our legal system is that laws which regulate persons or entities must give fair notice of conduct that is forbidden or required."); *id*. ("regulated parties should know what is required of them so they may act accordingly"); *Christopher v. SmithKline Beecham Corp.*, 132 S. Ct. 2156, 2168 (2012) ("It is one thing to expect regulated parties to conform their conduct to an agency's interpretations once the agency announces them; it is quite another to require regulated parties to divine the agency's interpretations in advance …."). Further, under the most generous interpretation, the publication of the Proposed Rule would provide affected units, with at most, four years and 25 days until the beginning of the ozone season in 2026. Even if this were a valid consideration, the additional time provided by virtue of publication of the Proposed Rule would not come close to addressing the constraints on compliance for the interstate natural gas pipeline industry, as these comments explain.

attainment deadline. That is the case unless it is impossible for sources to achieve those emission reductions in that timeframe. The schedule EPA has proposed for engines in the pipeline transportation of natural gas sector is impossible for the affected units to meet. As such, EPA has the authority and the obligation to establish alternative, workable compliance deadlines in the final rule.

VI. EPA Has Not Adequately Evaluated Reliability Issues.

Installation of controls and monitoring equipment will require taking affected units offline for extended periods of time. Installing controls to meet EPA's proposed schedule is certain to have serious reliability implications due to the Proposed Rule's impact on interstate natural gas pipeline companies that operate as an interconnected system. EPA has not assessed how the system will be impacted nor offered any guidance on how such a massive effort could be coordinated.

Each pipeline will need to take their affected units offline at the same time to meet EPA's compliance deadline because the time needed to complete the necessary retrofits would preclude an orderly, sequential approach. This will greatly reduce throughput throughout the nation, leading to reliability issues. This is the case because the U.S. natural gas pipeline system is a highly integrated network.[89] Thus, if throughput is reduced across the 23 states covered by the Proposed Rule, shippers in other states who depend on natural gas being transported first to those 23 states will be impacted.

For example, New England "has no indigenous fossil fuels and therefore, fuels must be delivered by pipeline, ship, truck, or barge from distant places."[90] "[A] failure at a single point

[89] EIA, *Natural Gas Explained*, available at https://www.eia.gov/energyexplained/natural-gas/natural-gas-pipelines.php.

[90] ISO-NE, Natural Gas Infrastructure Constraints, available at https://tinyurl.com/2p9ewwjc.

on the pipeline system . . . in New England will likely create significant impacts."[91] The pipelines delivering natural gas into New England run through New York and New Jersey—two states covered by the EPA's proposal. The removal of RICE units in those states could reduce capacity delivered into New England and cause significant disruptions.

Because affected pipelines will not be able to coordinate repair schedules, large volumes of capacity are likely to be reduced at the same time period as a result of the Proposed Rule. These periods will likely extend over times of "peak" demand, either during winter or summer months when natural gas utilities and electric generators (who are pipeline shippers) need natural gas service to provide heat or air conditioning for their customers. During these periods, at a minimum, pipelines operate at full capacity and need all of their compressor units available to run. Removing multiple units from service during these high demand periods will inevitably lead to reliability issues. Even during non-peak periods, reducing pipeline capacity for long periods of time will reduce pipeline throughput, preventing shippers from transporting as much gas as their users require.

Neither the Proposed Rule nor any of the technical support documents currently in the docket provide any substantive analysis of reliability issues for the interstate natural gas pipeline industry. EPA cannot reasonably evaluate the appropriateness and feasibility of the Proposed Rule without assessing potential impacts on natural gas system reliability, supplies, and price. The Proposed Rule, accordingly, lacks a reasoned basis based on the current record. To address this shortcoming, EPA must evaluate reliability and tailor its rule to prevent serious and predictable reliability problems.

[91] *Id.*

VII. EPA Has Inappropriately Identified SCR as the Preferred Technology for Four-Stroke Lean Burn Engines.

For 4SLB engines, the Proposed Rule identifies SCR[92] as the technology basis to achieve the proposed NOx limit, while acknowledging that "layered combustion controls" (*i.e.*, typically referred to as low emissions combustion or LEC technology) may apply. While SCR application is fairly common for larger combustion sources, such as electric utilities and large industrial boilers, SCR application to RICE in the gas transmission industry is very rare. In previous RICE rulemakings, such as the spark ignition engine NSPS[93] or the NOx SIP Call Phase 2 rule, EPA clearly identified LEC technology as the preferred approach for 4SLB engines, and that technological choice still applies. For example, the Technical Support Document[94] for the NOx SIP Call and the Response to Comments[95] for that rulemaking identify LEC as the control technology for both 4SLB and 2SLB. An EPA commissioned report[96] supporting the NOx SIP Call also identifies LEC as the preferred control technology for lean burn engines. The more recent Subpart JJJJ rulemaking also based NOx standards on LEC control.

LEC is the preferred technology for natural gas operators for many reasons, including environmental, reliability, and economic reasons. Once the retrofit installation is complete, LEC technology is inherent to engine operation and requires minimal additional attention to engine operating and maintenance procedures. SCR requires considerable attention to the reagent

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[92] 87 Fed. Reg. at 20,142.

[93] 40 C.F.R. Part 60, Subpart JJJJ.

[94] "Stationary Reciprocating Internal Combustion Engines Technical Support Document for NOx SIP Call" (Oct. 2003).

[95] "Response to Comments Phase II NOx SIP Call Rulemaking" (Apr. 1, 2004).

[96] "NOx Emissions Control Costs for Stationary Reciprocating Internal Combustion Engines in the NOx SIP Call States," E.H. Pechan and Associates report for U.S. EPA Innovative Strategies and Economics Group (Aug. 2000) ("Pechan Report").

injection system and instrumentation that controls reagent feed rate. The pollution prevention provided by LEC (*i.e.*, emissions are not formed) is far preferrable to post-combustion exhaust control, and the operational simplicity compared to SCR ensures engine availability. While the initial capital investment *may* be marginally higher for LEC retrofit technology, ongoing operating costs are significantly lower.

The environmental performance of LEC is also superior. Similar NOx levels can be achieved with LEC and SCR, and LEC technology performance is ensured because it is inherent to engine operation, while SCR requires proper control of ammonia injection and catalyst performance. In addition to low NOx levels, LEC can provide improved efficiency (*i.e.*, lower fuel use) and lower emissions of unburned hydrocarbons due to improved in-cylinder mixing prior to ignition of the air-fuel mixture. Thus, LEC can reduce GHG, VOC, and carbon monoxide ("CO") emissions relative to an uncontrolled lean burn engine. In addition, since a reagent or chemical addition to the process is not required, LEC eliminates the negative environmental impacts of SCR—*e.g.*, ammonia emissions ("ammonia slip" past the catalyst); impacts of ammonia production and frequent delivery to the site; catalyst production, cleaning and disposal; and operational inefficiencies caused by exhaust back pressure on the engines caused by the catalyst.

This "technology choice" does not impact the NOx emission standard proposed, but EPA should ensure that the record in the final rule clearly indicates LEC is the preferred control technology for 4SLB engines.

VIII. Assumed NOx Control Efficiencies Are Inaccurate and Not Consistent with Past EPA Decisions.

The natural gas transmission reciprocating engines affected by the Proposed Rule are similar in key respects to the units regulated in the NOx SIP Call Phase 2 rule. In that action,

EPA focused on the very largest units (*i.e.*, those with ozone season emissions above 1 ton per day, which is equivalent to 365 TPY). As discussed above, in this rulemaking, EPA initially identified units in the affected states with emissions above 100 TPY and then incorrectly equated that to a 1,000 hp uncontrolled engine. The gas transmission reciprocating engines affected by the Proposed Rule are, therefore, the same industrial class and type of equipment regulated by the NOx SIP Call Phase 2 rule, but with a much lower applicability threshold. Since the NOx SIP Call Phase 2 rulemaking, additional units have been controlled or otherwise reduced emissions due to state RACT rules or system upgrades (*e.g.*, hp replacement with a turbine), but the technical facts and science relevant for the NOx SIP Call Phase 2 rule still apply today.

In the previous rulemaking, EPA analysis led to conclusions regarding baseline uncontrolled emissions, applicable control technologies (*e.g.*, LEC for lean burn engines and NSCR for rich burn engines), and average reductions from control. For example, EPA determined that the majority of affected units were 2SLB engines, and an EPA report[97] concluded, on average, that baseline emissions were 16.8 g/bhp-hr and that LEC would achieve 82 percent average control with an endpoint just under 3 g/bhp-hr. The "layered combustion technology" referred to in the Proposed Rule preamble is a new EPA moniker for LEC control, and that technology is discussed in detail in the EPA report noted above. The technology basis and emission standard for 2SLB evaluated in the 2000 Pechan Report are consistent with the NOx standard for 2SLB units in the Proposed Rule as well as EPA's emission standard for reconstructed or modified units (*i.e.*, units requiring retrofit) in Subpart JJJJ.[98]

[97] *See* Pechan Report, *supra* footnote 95.

[98] 40 C.F.R. § 60.4233(f)(4).

However, the docket document summarizing EPA reduction estimates includes much higher control levels than those EPA previously determined to be realistic. For 2SLB units with LEC, EPA now typically applies 97 percent reduction. From the baseline in the previous EPA report, this equates to an emission rate of 0.5 g/bhp-hr. While this may be acceptable as the level achievable for a new lean burn engine, it is not an accurate representation of the average emission level achievable for existing units. Similarly, EPA estimates over 95 percent reduction for NSCR on rich burn engines, which equates to an endpoint less than 0.5 g/bhp-hr. EPA notes that it has reviewed results within this range for all engine types,[99] but this assertion does not adequately justify EPA's departure from the Agency's well-documented conclusions in the EPA NOx SIP Call Phase 2 rule docket.

As discussed in comments above regarding EPA's significant underestimate of unit counts and estimated reductions, INGAA welcomes additional analysis to better define the emissions budget and reductions contained in the Proposed Rule. Additional time would be needed for EPA to prepare and the public to assess such information, and INGAA offers its assistance in those efforts. In the absence of additional detailed analysis, however, EPA should re-evaluate the emissions control levels assigned to affected gas transmission RICE because EPA did not assign accurate emission control level to those units.

IX. EPA Properly Proposed Parameter Monitoring for Compliance Assurance for Natural Gas Transmission Reciprocating Engines.

For LEC-equipped lean burn reciprocating engines, EPA proposes continuous parameter monitoring[100] systems ("CPMS") for compliance assurance. INGAA supports EPA's proposed monitoring approach for compliance assurance of natural gas transmission reciprocating engines.

[99] 87 Fed. Reg. at 20,142, Table VII.C–1.

[100] *Id*. at 20,177; 40 C.F.R. § 52.41(d)(4).

INGAA recommends minor changes to the requirements for catalyst equipped engines (*e.g.*, 4SRB engines using NSCR). Additional details regarding parameter monitoring follows. In addition, information is provided to support EPA's decision not to require continuous emissions monitoring systems ("CEMS") for gas transmission reciprocating engines.

A. Parameter Monitoring for LEC-equipped Lean Burn Engines

As discussed in section VII, LEC is the preferred NOx control for all lean burn engines. Once installed, LEC technology is inherent to engine operation and the combustion controls cannot be "turned off" or bypassed. Compliant emissions are ensured by proper operation of the combustion process, and basic operating parameters can be monitored to ensure combustion health. The Proposed Rule requires a site-specific monitoring plan for LEC engine CPMS. A brief overview of example parameters to monitor is discussed here based on permit conditions for LEC monitoring at existing major source facilities (*e.g.*, to address compliance with state RACT requirements).

The majority of affected transmission reciprocating engines are 2SLB units, and combustion-based emission controls will include adding additional air (to lower temperatures and decrease NOx), higher energy ignition to ensure the lean mixture is ignited, and/or higher-pressure fuel injection to improve the uniformity of the in-cylinder mixture and enhance combustion stability. Combustion performance is ensured by monitoring parameters that indicate operation within expected norms, including fuel use, air manifold pressure, and air manifold temperature. The parameters, measurement specifications, and accepted operating range would be provided in the monitoring plan, and similar plans will be utilized for all 2SLB engines in a company fleet.

B. Parameter Monitoring for Rich Burn Engines

For 4SRB engine parameter monitoring, the Proposed Rule includes continuous monitoring of catalyst inlet temperature and monthly monitoring of catalysis pressure drop ("ΔP"). Section 52.41(d)(3)(ii) of the Proposed Rule requires ΔP monitoring monthly, with maintenance required "if the pressure drop is greater than 2 inches outside the baseline value established after each semiannual portable analyzer monitoring." The criteria are similar to RICE national emission standards for hazardous air pollutants ("NESHAP") monitoring requirements for 4SRB engines with NSCR but fail to acknowledge an important operational constraint—ΔP can vary from month to month due to the operating load of the engine because exhaust flows change with load. Thus, rather than requiring the operator to compare the monthly reading to the "baseline value established after each semiannual portable analyzer monitoring," the operator should be allowed to compare the ΔP to the value measured during any previous emissions test conducted at a similar load and then assess whether action is warranted. The operator can maintain records to document any instance where monthly ΔP monitoring warrants review or follow-up, including documentation of maintenance or other action conducted when deemed necessary.

This issue is discussed and explained in detail in INGAA comments[101] on the 2002 RICE NESHAP proposal, including documentation of how ΔP can vary with operating load. The RICE NESHAP approach to conduct ΔP at "full load" and compare to the value from a "full load" performance test is not recommended, because that load may not be achievable month-to-month. In addition, the proposed requirement to compare with the most recent performance test is not desirable because the biannual test may not always be possible at full load. Thus, INGAA recommends that monthly ΔP monitoring assess the measured value relative to a change greater than 2 inches from a

[101] INGAA Comments on Proposed RICE NESHAP, Docket ID No. OAR-2002-0059 (Feb. 19, 2003).

previously measured value associated with a performance test at a similar load. The operator can maintain records of the measurement and review of actions taken whenever the value by more than 2 inches (of water column) from the value measured in a previous test at similar load, rather than the most recent performance test.

C. CEMS are Not Warranted for Natural Gas Transmission Reciprocating Engines.

EPA has considered CEMS for natural gas transmission compressor drivers in past rulemakings and consistently concluded that CEMS are not warranted due to costs and the availability of other established methods for compliance assurance. This technical basis still stands, and CEMS are not warranted.

EPA contemplated NOx CEMS during combustion turbine NSPS review in 2005. The preamble to proposed Subpart KKKK indicates that NOx CEMS were considered as a monitoring requirement for the proposal, but EPA concluded that CEMS costs are too high relative to a reliable alternative—annual stack testing and/or parameter monitoring. INGAA supports the EPA conclusion regarding the excessive costs of CEMS (without commensurate benefit), and also supports the conclusion that a periodic source test provides a reliable basis for demonstrating compliance with the NSPS standard. Parameter monitoring is provided as an alternative to testing in Subpart KKKK.

Analysis of CEMS costs is presented in a docket memorandum (Docket Document No. OAR-2004-0490-0115). The docket document and the preamble conclusions regarding CEMS are further supported by:

- CEMS cost analysis for other reciprocating engines rules that indicate costs similar to or higher than the cost projection for Subpart KKKK.
- Recent precedent from NSPS and maximum achievable control technology (“MACT”) standards regarding monitoring requirements and the exclusion of CEM requirements.

In addition to the cost analysis in the Subpart KKKK docket, other EPA rulemakings included the consideration of the costs of CO CEMS for MACT standards. Note that CO CEMS costs are comparable to NOx CEMS costs, with a NOx unit likely to be marginally more costly due to higher instrumentation and operating costs for a NOx analyzer. Examples of regulations that considered CEMS include the Turbine NESHAP, Engine Test Cell NESHAP, Reciprocating Internal Combustion Engine NESHAP, Petroleum Refinery NESHAP, Mineral Wool NESHAP, and Hospital/Medical/Infectious Waste Incinerator NESHAP. For these standards, analysis indicated CEMS costs similar to or higher than the estimate for Subpart KKKK. In each case, costs were considered excessive and CEMS were not required. These decisions are relevant because they provide an indication of consistency in EPA's justification of monitoring requirements and demonstrate the environmental burdens associated with the sources and regulations that did not require CEMS under Part 63. For example, the environmental implications of the Waste Incineration MACT invoke a higher level of concern and are associated with a higher probability of emissions performance variability than reciprocating engine NOx emissions.

In addition, the efficacy of reciprocating engine LEC supports an approach based on parameter monitoring and periodic testing. As opposed to add-on emission control technologies where performance can be dramatically affected by short term deviations in a key process parameter (*e.g.*, ammonia feed rate for SCR), LEC is a pollution prevention approach with the NOx control inherent to the design and operation of the engine. The control technology cannot be "turned on or off" by the operator and emissions performance is inherent to the operation and functionality of the unit. A periodic test provides assurance that minor changes or upward trending of NOx emissions that may occur over longer time periods due to equipment wear will

be monitored and addressed. Because of the performance of LEC combustion technology and the viability of periodic source tests and parameter monitoring, implementation of CEMS cannot realize an incremental benefit in ensuring performance commensurate with the CEMS costs.

The proposed RICE NESHAP (Part 63, Subpart ZZZZ) considered CEMS for CO for lean-burn engines greater than 5,000 hp to demonstrate compliance with the CO percent reduction standards. For lean burn engines less than 5,000 hp, EPA proposed periodic stack testing and continuous monitoring of operating parameters. For that standard, EPA ultimately concluded that CEMS were not warranted and parameter monitoring and periodic tests assured compliance.

CO CEMS costs were included for both the RICE NESHAP and the Engine Test Cell NESHAP, with estimated costs slightly higher in the latter. Very little detail was provided to understand how the different costs were derived, but costs were likely based on the EPA CEMS Cost Model. For the Engine Test Cell NESHAP MACT, a docket memorandum (Item II-B-9 of Air Docket A-98-29) indicates that the costs were determined using EPA's CEMS Cost Model Version 3.0, updated in 1998. The projected costs (20 years ago) include an estimated initial cost of $232,400, with an estimated annual cost of $69,000.

EPA considered the cost differential between CEMS and approaches based on parameter monitoring with periodic tests in several NESHAPs—and selected parameter monitoring as a reasonable approach. Many examples are available where EPA concluded CEMS were not warranted and other compliance assurance measures were available (*i.e.*, parameter monitoring and/or testing). Other examples include the Petroleum Refineries NESHAP for catalytic cracking units, the Mineral Wool NESHAP, and the Hospital/Medical/Infectious Waste Incinerator NESHAP. EPA consistently concluded that parameter monitoring and/or periodic tests provided

compliance assurance.

In addition, there is no evidence in the Proposed Rule docket to suggest that CEMS would provide any appreciable emissions control improvement as compared to parameter monitoring and periodic tests. Lacking any such evidence, it is clear that parameter monitoring and periodic tests provide compliance assurance, and CEMS are not warranted.

X. EPA Has Proposed Unnecessary Assurance and Compliance Provisions.

A. The Proposed Rule Should Be Amended to Clearly Identify Accepted Methods for NOx Emission Tests.

The Proposed Rule would require biannual emissions tests for affected RICE, and section 52.41(d)(2)(iii) cites federal code for identifying applicable test methods. To avoid confusion and ensure appropriate methods are clearly allowed, INGAA recommends amending this section to add a direct citation of applicable NOx methods and approved alternatives for units subject to EPA's NSPS for spark-ignited RICE, 40 C.F.R., Part 60, Subpart JJJJ. For NOx measurement, this includes:

- Method 7E of 40 CFR part 60, appendix A-4
- ASTM Method D6522
- Method 320 of 40 CFR part 63, appendix A
- ASTM Method D6348
- ALT 138,[102] which allows the use of OTM-39[103] as an alternative to ASTM Method D6522
- CTM-022, CTM-030, CTM-034

[102] Letter from Steffan M. Johnson, Leader, EPA Measurement Technology Group to Wendy Coulson (Aug. 25, 2020), available at https://www.epa.gov/sites/default/files/2020-08/documents/prci_08_24_2020_signed.pdf.

[103] OTM-39 Method for Determination of Oxygen, Carbon Monoxide and Nitrogen Oxides from Stationary Sources using Portable Gas Analyzers Equipped with Electrochemical Sensors, available at https://www.epa.gov/sites/default/files/2020-08/documents/otm-39_performance_method_using_portable_gas_analyzers_08_24_2020.pdf.

Amending the Proposed Rule to include this list of accepted NOx test methods will improve clarity and ensure the federally approved list of RICE test methods can be used for periodic tests. The Proposed Rule should make clear, moreover, that owners and operators of affected units are free to choose from among these various options.

B. The Proposed Performance Testing and Reporting Requirements Are Overly Burdensome.

The Proposed Rule would require semi-annual performance testing for units that do not meet the certification requirements of section 60.4243(a). Proposed section 52.41(d)(2) would require new engines to conduct an initial performance test within six months of engine startup and subsequent tests every six months thereafter. Existing engines would be required to conduct an initial performance test within six months of becoming subject to an emission limit under the Proposed Rule and would have to conduct subsequent tests every six months thereafter. Similarly, the Proposed Rule would require semi-annual reporting of data generated by the required performance testing.

Because the Proposed Rule is intended to address emissions during the ozone season, which runs from May 1 to September 30 of each calendar year, a single performance test and report per year should be sufficient to demonstrate compliance. Limiting performance testing and reporting to an annual requirement would also provide significant cost savings.

This would be a practical measure for a number of reasons. For instance, a significant number of the units that would be subject to the Proposed Rule would also be regulated pursuant to the NSPS for stationary spark ignition internal combustion engines in 40 C.F.R. Part 60, Subpart JJJJ. Those tests are conducted on an annual basis, and EPA should not layer additional, contrary requirements on Subpart JJJJ sources through the Proposed Rule.

Further, for many units, semi-annual testing would be impractical. For example, semi-annual testing for compressors located at storage facilities that are used both for storage and transmission operations is unnecessary and infeasible. Those units, which would be covered by the Proposed Rule, are used to inject gas into storage fields when it is purchased in the summer and pumped into transmission pipelines based upon market demands in the fall and winter. During the summer, when gas is purchased and injected, compressor capacity can be controlled and maintained at 90 percent, as required for conducting a reliable emissions test. During fall and winter withdrawals, however, that capacity cannot be maintained, preventing a meaningful stack test. Accordingly, EPA should eliminate semi-annual testing.

The Proposed Rule would also rely exclusively on electronic submittal of performance testing. EPA should allow owners and operators alternative means of submitting required reports. The Agency should also allow submittal in hard copy form where that approach is required by the relevant state authority.

INGAA requests that EPA consider amending these proposed requirements.

XI. Issues Related to States EPA Has Identified as Linked to Downwind Nonattainment or Interference with Maintenance for Emissions from Non-EGUs.

If EPA were to pursue adding additional states to the non-EGU Good Neighbor Plan region, the Agency would be required to first propose such action and provide a sufficient record basis to support such action. The requirement that agencies provide notice and an opportunity for comment on a proposed rule is a basic hallmark of administrative law that is grounded in the constitutional right to due process. As long recognized by the courts, the purpose of adequate notice in the rulemaking process is to "provide an accurate picture of the reasoning that has led the agency to the proposed rule," and to allow interested parties to contest that rulemaking if they

see fit.[104] Any decision to expand the scope of the Proposed Rule to include additional states or sources is substantial enough to fundamentally alter the premises of the proposal and to require additional notice to adequately inform potentially interested parties.[105] Accordingly, INGAA requests that EPA ensure that any significant change in course from the terms of the Proposed Rule be noticed through a supplemental proposal.

XII. The Proposed Rule Contains Regulatory Language that Should Be Modified.

The regulatory language that EPA has published includes provisions that are ambiguous, contain clerical errors, or that otherwise should be clarified to avoid unnecessary confusion. This section of INGAA's comments identifies those provisions and suggests appropriate revisions for EPA's consideration.

The definition of "affected unit" should be amended to make clear that emergency engines are not included in the Proposed Rule's requirements. As a policy matter, the vast majority of emergency engines are not likely to have emissions in significant amounts due to their limited hours of operation, and are, therefore, regulated pursuant to other, more appropriate programs. Furthermore, due to the limited hours of operation, it is extremely unlikely that additional controls on emergency engines over the hp threshold are economically feasible, based on the marginal cost threshold of up to $7,500 per ton referenced in the Proposed Rule. Clarifying the definition of affected unit to address this issue would avoid unnecessary confusion on behalf of potentially affected owners and operators.

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[104] *Connecticut Light & Power Co. v. Nuclear Regulatory Commissions*, 673 F.2d 525, 530 (D.C. Cir.), *cert. denied*, 459 U.S. 835 (1982).

[105] *See City of Waukesha v. EPA*, 320 F.3D 228, 245-47 (D.C. Cir. 2003) (explaining that final rule must be "logical outgrowth" of the agency's proposed rule).

The applicability section of the Proposed Rule should be amended to address several issues. First, the provision states that the Proposed Rule's requirements apply to states "listed in § 52.40(a)(1)(ii), including Indian country located within the borders of any such State(s)."[106] The cross-reference should be to § 52.40(b)(2).

Second, similar to recent NSPS on pipeline transportation for compressor stations, *i.e.*, NSPS Subpart OOOOa, the applicability section of the Proposed Rule should be amended to include only those activities at an LNG facility that meet the intent of the included industrial source type "Reciprocating internal combustion engines in Pipeline Transportation of Natural Gas." Based on the definition in the Proposed Rule for "Pipeline transportation of natural gas," only the portion of an LNG facility directly related to the pipeline transportation of natural gas, *i.e.*, the "compressor station" of the LNG facility, would be subject to the Proposed Rule.

The provisions specified in proposed section 52.41(c)(1)-(3), specifying emission limits, should be revised as follows:

(1) If you own or operate a natural gas fired four stroke rich burn spark ignition engine with a nameplate rating of 1,000 hp or greater ~~than~~ then you must meet a nitrogen oxides (NOx) emissions ~~limits~~ limit of 1.0 grams per hp-hour (g/hp-hr).

(2) If you own or operate a natural gas fired four stroke lean burn spark ignition engine with a nameplate rating of 1,000 hp or greater ~~than~~ then you must meet a NOx emissions ~~limits~~ limit of 1.5 g/hphr.

(3) If you own or operate a natural gas fired two stroke lean spark ignition engine with a nameplate rating of 1,000 hp or greater ~~than~~ then you must meet a NOx emissions ~~limits~~ limit of 3.0 g/hp-hr.[107]

[106] 87 Fed. Reg. at 20,177.

[107] *See id*.

In proposed section 52.41(d)(1), the cross-reference to paragraph (b) should be paragraph (c).[108]

In proposed section 52.41(d)(2)(B), the cross-reference to paragraph (b) should be paragraph (c).[109]

The requirement stated in proposed section 52.41(d)(4)—"(4) If you are not using a SCR or NSCR control device to reduce emissions are required to install a continuous parameter monitoring system (CPMS)"—is unclear and should be revised.[110]

XIII. Conclusion

INGAA and its members appreciate this opportunity to provide EPA with comments on its proposed Good Neighbor Plan for the 2015 Ozone NAAQS. As these comments demonstrate, the Proposed Rue's requirements for the pipeline transportation of natural gas sector are based on seriously flawed data and assumptions about the industry. The misinformation in the record has resulted in estimates of affected units and projections of emission reductions under the Proposed Rule that bear little resemblance to reality and, if implemented, would not appropriately address significant contribution to downwind nonattainment or maintenance issues. On the contrary, the Proposed Rule would lead to significant over-control and risk the reliability of the nation's natural gas supply, while imposing costs and other burdens that EPA has not considered. Accordingly, INGAA requests that EPA reevaluate it proposed requirements for the pipeline transportation of natural gas sector, and that the Agency engage with INGAA and its members to develop a rule that will lawfully and more effectively address emissions from natural gas

[108] *See id*.

[109] *See id*.

[110] *See id*.

pipeline facilities. INGAA further suggests that EPA consider withdrawing the Proposed Rule or issuing a supplemental proposal to address the issues raised in these comments. INGAA looks forward to providing the Agency with additional information and support.

Sincerely,

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