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Comments of the Council of Industrial Boiler Owners (CIBO) on
Standards of Performance for Stationary Gas Turbines: Standards of Performance for
Stationary Combustion Turbines
Proposed rule; 77 Fed. Reg. 52554 (August 29, 2012)

The Council of Industrial Boiler Owners (CIBO) appreciates the opportunity to comment on EPA's proposed revisions to the New Source Performance Standards for Stationary Gas Turbines.

CIBO is a broad-based association of industrial boiler owners, architect-engineers, related equipment manufacturers, and University affiliates with members representing 20 major industrial sectors. CIBO members have facilities in every region of the country and a representative distribution of almost every type of boiler and fuel combination currently in operation. CIBO was formed in 1978 to promote the exchange of information within the industry and between industry and government relating to energy and environmental equipment, technology, operations, policies, law and regulations affecting industrial boilers. Since its formation, CIBO has been active in the development of technically sound, reasonable, cost-effective energy and environmental regulations for industrial boilers. CIBO supports regulatory programs that provide industry with enough flexibility to modernize -- effectively and without penalty - the nation's aging energy infrastructure, as modernization is the key to cost-effective environmental protection.

OVERVIEW OF RULE AND COMMENTS

This rule responds in part to a petition for reconsideration of the 40 CFR 60 Subpart KKKK rule issued in 2006. 71 FR 38482; July 6, 2006. This rule makes changes to KKKK and conforming amendments to GG. It addresses burning low-Btu gases such as biogas (landfill gas) and proposes to exempt some stationary combustion turbines that are subject to other standards from being subject to NO_x and SO_x standards in KKKK. It sets standards for NO_x and SO₂. 77 FR 52558-52560; August

29, 2012. EPA also proposes a number of other amendments to existing turbine NSPS rules at 40 CFR 60 Subpart KKKK.

Most significantly, EPA proposes is to change fundamental NSPS reconstruction definitions as applied to combustion turbines so that when combustion turbines are maintained and repaired or turbine engines are replaced, reconstruction provisions are triggered and the source would be subject to new source 40 CFR Subpart KKKK provisions. EPA explains that those standards represent advances in NO_x controls and the use of low sulfur fuels since Subpart GG was promulgated in 1979. In addition, the rule makes Subpart KKKK applicable to stationary combustion turbines on which construction, modification or reconstruction is commenced – based on this newly proposed definition of reconstruction -- applicable to changes that may have previously occurred any time after February 18, 2005.

This proposal is a vast departure from US EPA's long-standing recognition that turbine routine maintenance does not constitute modification or reconstruction of the turbine. The original intent of the NSPS was to allow turbine overhauls and EPA has recognized that turbine routine maintenance requires replacement of many turbine parts. *See Standards and Support for the Environmental Impact Statement: Proposed Standards of Performance for Stationary Gas Turbines*, EPA-450/2-77-017a; September 1977 at 5-6.

Many CIBO member companies own and operate stationary combustion turbines including CHP and other units and equipment configurations that reflect the most energy efficient industrial and energy generating systems in operation. EPA and DOE strongly encourage the adoption of these technologies to increase efficiency and decrease pollutant emissions. The August 30, 2012 Executive Order: *Accelerating Investment in Industrial Energy Efficiency*, among other things, establishes a national goal of deploying 40 gigawatts of new, cost effective industrial CHP in the United States by the end of 2020. This EPA proposal works directly *counter* to that goal. The proposed rule includes significant changes to core NSPS definitions that affect when routine repair and maintenance at facilities constitute “reconstruction” and thereby impose new source standards on existing sources. Several of these changes will *discourage* the further deployment of CHP technology as compared to the now-applicable rules. Before finalizing this rule, EPA

and DOE should critically assess the potential environmental impacts from this approach, measured against gains from continuing the course of encouraging CHP conversions.

COMMENTS

I. EPA SHOULD NOT REDEFINE THE AFFECTED SOURCE FOR PURPOSES OF DETERMINING “RECONSTRUCTION” AND CANNOT ACCOMPLISH THIS RETROACTIVELY.

This rule asserts that under the Subpart KKKK rule promulgated in 2006, EPA intended “reconstruction” to be triggered when a combustion turbine engine was replaced. 77 FR 52564. The rule further asserts that these proposed Subpart KKKK provisions simply “clarify” that intention. EPA cannot through this rulemaking retroactively redefine what reconstruction is under 40 CFR 60 Subpart KKKK. KKKK established February 18, 2005 as the date for applicability of new source standards to any units commencing construction, modification or reconstruction after that date. 71 FR 38483; 40 CFR §60.4300. This rule proposes substantive changes to Subpart KKKK, effective as of February 18, 2005.

The definition of reconstruction for NSPS applicability purposes has been in place since 1975. "Reconstruction" is defined as the replacement of components at an “affected source” to such extent that the fixed capital cost of the new components exceeds 50% of the fixed capital cost of a comparable entirely new facility. 40 C.F.R. § 60.15(b)(1).¹ As EPA has often explained, the reconstruction definition ensures that sources do not circumvent the application of NSPS to their facility by replacing all of the components of an existing unit rather than buying a new unit that would be subject to NSPS.

The “affected source” is defined by the applicable NSPS. Under KKKK, the “affected source” is the “stationary combustion turbine,” which includes the engine and all associated equipment:

Stationary combustion turbine means all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems (except emissions control equipment), heat recovery system, and any

¹ If the 50% threshold is exceeded, the source must seek a determination from EPA as to whether compliance with the applicable NSPS is technically and economically feasible. 40 C.F.R. § 60.15(b)(2) and (d).

ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine, any combined cycle combustion turbine, and any combined heat and power combustion turbine based system.

40 CFR §60.4420;71 FR 38483.

Whether the fixed capital cost of the new components in an overhaul exceeds 50% of the fixed capital cost of an entirely new combustion turbine, is examined as a fraction. The numerator is the cost to overhaul the existing combustion turbine. The denominator is the cost of acquiring and installing a comparable new combustion turbine.

In this proposed rule, EPA does not change what a source would consider in the numerator of the fraction: the cost of the repair or maintenance project. However, EPA does propose to change the denominator. The plain text of Subpart KKKK defines the denominator as the cost of “all equipment” associated with the turbine (engine, heat recovery system, piping, lubrication system, etc.). *Id.* Here, EPA proposes to define the denominator as the cost of the “combustion turbine engine” only (the air compressor, combustor, and, turbine sections). 77 FR 52556. Compared to “all equipment”, the “engine” is a dramatically smaller denominator for the cost comparison. The practical effect would be to increase dramatically the number of overhauls that would constitute “reconstruction” and thereby be subject to NSPS for KKKK rather than GG.

EPA acknowledges that the Subpart KKKK rule promulgated in 2006 provided an “expanded definition” of the affected facility. 77 FR 52556. However, EPA insists that it did not intend the expanded definition to be used as the denominator in the cost comparison for determining whether a source is reconstructed. Instead, EPA posits, it intended only to “recognize the benefit of CHP” units:

[D]ue to the broad definition of affected facility in KKKK, the combustion turbine engine does not necessarily constitute the majority of the costs of a new stationary combustion turbine. The expanded definition of a stationary combustion turbine in subpart KKKK is intended to simplify compliance and recognize the environmental benefit of heat recovery at combined cycle and combined heat and power (CHP) facilities. It was not intended to change the circumstances in which a turbine engine is designated as new or reconstructed.

Id. EPA next asserts that Subpart KKKK is ambiguous and “could be interpreted” to mean that the “all equipment” expanded definition of affected facility is the denominator for the reconstruction cost comparison:

[U]nder subpart KKKK it is not clear whether a CHP or combined cycle facility that replaces the turbine engine would be considered “new” or “reconstructed”. The existing language KKKK could be interpreted to mean that replacement with a turbine engine with a new turbine engine at an existing combined cycle or CHP facility not subject to KKKK would result in new turbine engine subject to GG

Id.

EPA’s concern is clearly that the expanded definition could result in engine replacements that do not trigger new source status and tighter standards of Subpart KKKK. Having earlier pointed out that the engine is the greatest source of emissions for the turbine unit², EPA insists that it had intended that new engines would be subject to tighter KKKK standards:

That was clearly not the intent when subpart KKKK was promulgated that these turbine engines would only be subject to emission control technologies that were available in the 1970’s....

Id.

EPA characterizes its rulemaking as a “clarification” of ambiguous regulatory text. 77 FR 52556. In addition, EPA claims the interpretation it advances here is consistent with its past interpretation:

“The owner/operator of a turbine engine that is overhauled or refurbished in such a manner that each individual component of the engine is tracked would still perform the traditional reconstruction analysis i.e. the owner/operator would compare the total cost of replacement components with the cost of a comparable new turbine engine.” 77 FR 52557

To rectify the circumstances, EPA proposes to change the definition of affected source for purposes of reconstruction cost analysis at turbine facilities:

Therefore while we are maintaining the broad definition of affected facility, we are proposing that for purposes of determining applicability and if a stationary combustion turbine is new or reconstructed only the combustion turbine engine itself will be considered... This rule as amended will make it clear that the replacement of a turbine engine at a CHP or combined cycle facility that is currently not subject to KKKK with a new turbine engine would result in the establishment of a new stationary

² “The combustion turbine engine (the air compressor, combustor and turbine sections) is the primary source of emissions from a stationary combustion turbine.” 77 FR 52556

combustion turbine under KKKK, as was intended when the rule was promulgated.

Id.

EPA offers an alternative to changing the definition of affected source for reconstruction cost analysis. Rather than alter the applicability provisions, EPA would instead update Subpart GG on a going-forward basis to reflect any updates to Subpart KKKK. This would ensure that even units that do not trigger reconstruction and new source status will still be subject to KKKK-equivalent standards under GG:

In the event the final rule does NOT include this clarification, the stationary combustion engine replaced at an existing combined cycle or CHP facility would be covered by subpart GG and the HRSG would be covered by the applicable steam generating unit NSPS. Subpart GG would be amended to include NO_x emission standards for turbine engines that are identical to those in Table 1 of subpart KKKK.

77 FR 52556.

Finally, EPA offers alternatives to defining reconstruction based on a cost analysis. Here, EPA would still focus on the refurbishment of the engine only,³ but rather than analyze cost, EPA proposes to establish a bright-line test that presumes reconstruction when the engine undergoes its third major overhaul. 77 FR 52557. EPA first proposes this approach for engines overhauled offsite, where the owner/operator lacks information about what parts of the unit were replaced. But EPA also seeks comment on whether this bright-line test defining reconstruction as the third engine overhaul could be used for turbines overhauled onsite as well. *Id.* As another alternative, EPA offers that the turbine could be considered reconstructed upon the replacement of only the combustion liner and fuel injection system. 77 FR 52557.

³ In this section of the proposed rule, EPA restates its new interpretation that the engine is the focus of the reconstruction analysis: “The owner/operator of a turbine engine that is overhauled or refurbished in such a manner that each individual component of the engine is tracked would still perform the traditional reconstruction analysis i.e., the owner/operator would compare the total cost of replacement components with the cost of a comparable new turbine engine.” However, under existing law, the denominator that should be used in this comparison is not the cost of a comparable new turbine engine; rather it is the cost of the affected unit which includes a substantial amount of additional components beyond the turbine engine (air compressor, combustor and turbine sections). 77 FR 52557.

The redefinition of reconstruction is a major change to fundamental NSPS provisions.

EPA asserts that the traditional reconstruction analysis compares the cost of replacement components with the cost of a comparable new turbine “engine”. 77 FR 52557. Notwithstanding EPA’s assertions, this description does not reflect traditional reconstruction analysis. By contrast to the current all-elements definition of “affected source” EPA now proposes to limit the affected source to the turbine engine only (air compressor, combustor and the turbine section itself). This fresh interpretation is not explained in Subpart KKKK and sharply diverges from all prior interpretation of reconstruction. This changed definition would make convulsive changes to the regulatory landscape for facilities with combustion turbines. It is an unanticipated reversal of a long-settled methodology for determining whether a source is reconstructed, as reflected in 40 CFR 60, Subpart A. §60.5⁴

The regulatory history of combustion turbine NSPS rules reinforces the fact that EPA had not previously intended that the engine alone would be the basis for a reconstruction analysis. In the technical support document to the subpart GG rulemaking, EPA went to great lengths to explain why an engine replacement alone would not constitute reconstruction:

In the gas turbine industry, the terms "overhaul" and "ultimate life" are not definable in terms used equally by all manufacturers. As an example, one manufacturer's "overhaul" is another manufacturer's "major disassembly inspection". To compound this nebulous situation, the intervals called "overhaul life" and "ultimate life" vary significantly among manufacturers and users. The variations in "overhaul life" and "ultimate life" are influenced by differences in gas turbine applications, operating loads, operating hours per start, fuel quality and maintenance practices. Most turbines are designed for 20,000 to 40,000 operating hours between overhauls and for an ultimate life of about 30 years. The 30 year figure for ultimate life is the design life of non-wearing parts such as rotor discs, casings, housing, bearing supports, and rotor shafts. Typically an overhaul returns a unit to "new" condition through the replacement of wearing or working parts and, therefore, the "ultimate life" of a gas turbine may be indefinite.

* * *

It is difficult to apply the definition of reconstruction to a gas turbine because substantial portions of a turbine may be replaced as a matter of routine

⁴ Limiting affected source to the combustion liner and fuel injection system (77 FR 52557) would be an even more radical rewrite of existing interpretations. It is common for burners or cans to be replaced. Under EPA’s assumptions, this would only occur once every 30,000-50,000 operating hours when in fact, it occurs much more frequently for some units, and such a condition has never been considered to constitute the reconstruction of a source.

maintenance during the normal overhauls as described in 5.2.1. Since it is current practice to replace substantial portions of turbines, it would be difficult to discriminate between a major overhaul that was performed to avoid the purchase of a new turbine and one that was performed in accordance with a routine maintenance program. Such routine maintenance should be exempted from the regulatory consequences of becoming a reconstructed turbine, subject to the “50 percent rule” discussed in 5.1.2.

US EPA, Standards Support and Environmental Impact Statement Vol. 1: Proposed Standards of Performance for Stationary Gas Turbines, Section 5.2.1 and 5.2.3, at 5-4 and 5-6 (EPA-450/2-77-017a September 1977). Thus, EPA’s 1977 original statements regarding the difficulty applying the reconstruction test to combustion turbines is contrary to EPA’s statements that this is simply “proposed clarification” to 40 CFR 60 Subpart KKKK’s intent. Nothing in subpart KKKK makes it clear that the maintenance process for combustion turbines has changed in a manner so that reconstruction is now triggered if the combustion turbine is being replaced. If anything, Subpart KKKK’s expanded definition of affected source validates EPA’s prior conclusion that it is not worth the effort to parse the details of each turbine overhaul to divine the motivation underlying the source’s decision to overhaul the turbine.

Although EPA clearly recognized that in the past, in the present proposal EPA ignores some of the reasons why sources decide to replace turbine engines or conduct overhauls offsite. In some cases, very new turbines will not meet their emissions guarantee or have other performance problems shortly after installation. Either because the type of diagnostic equipment and tools needed to repair the engine are not available onsite, or because bringing them to the site may not be feasible, sometimes the engine is simply replaced with one identical in operating characteristics. In addition, turbines are designed to allow removal of the engine for service offsite because there may not be room at the facility to perform engine repair even if the expertise and tools needed are available. These scenarios are typical for turbines and EPA had understood this, as reflected in the regulatory history of the combustion turbine NSPS.

EPA cannot rewrite a regulation under the pretense of consistency with past interpretations or textual ambiguity where EPA’s new interpretation is not consistent and the text is clear.

EPA disclaims that this proposal changes the law by asserting that 1. its interpretation has not changed; and 2. Subpart KKKK is “not clear” 77 FR 52556 and is “clarified” by the present proposal.

Id. EPA supports these incorrect assertions by explaining that EPA had never intended the broad definition of affected source under KKKK to permit the upgrade of an engine without subjecting it to tighter standards. Id. And EPA further explains that it could not possibly have intended that outcome given that the engine is the largest source of emissions at a turbine unit.

Subpart KKKK is clear on its face. It defines the “affected source” as “all equipment, including by not limited to [specifically named elements of a turbine unit]” This wants of no clarity. Other NSPS provisions are equally clear: for reconstruction analysis, the project cost is compared to the affected source. If EPA intended a different result, then EPA should have used language that would have given effect to its intent. But it cannot several years later declare clear regulatory text unclear because that regulatory approach has had an unwelcome effect.

A post-facto reinterpretation would open the door for compliance violations by sources that relied on clear regulatory text, and upset investment-backed expectations of already completed maintenance projects.

In the worst imaginable case, EPA appears to be setting the stage to apply this changed definition retroactively to already completed projects at turbine facilities. Applying this new narrow affected source definition to past projects may expose sources to compliance violations for decisions made in reliance on the clear text of KKKK that they understood to comply with the CAA. The liability concern is not limited to possible enforcement actions, but also to possible third party claims.

If EPA desires to change its interpretation, EPA must forthrightly take notice and comment on that change and defend its changed views on their own terms. Perhaps that is what EPA will do when it finalizes this rule.

If instead EPA asserts that parties misunderstood the intended meaning of subpart KKKK – and that the “affected source” for reconstruction analysis is the engine -- then EPA will be making a post-hoc change in the law. Sources that have complied with the clear terms of subpart KKKK face grave consequences if EPA now pretends the law means something different than it has been understood to mean. There is no worse outcome than exposing regulated sources to compliance violations on the pretense that the law meant something other than what its clear text indicates.

Not only would those sources potentially now face subpart KKKK violations, but whether a source is also subject to new source review (NSR) hinges in part on whether an action was routine maintenance replacement and repair (RMRR) or instead constitutes reconstruction. NSR for many State minor and major source programs is triggered when a source is “modified” or “reconstructed” as these terms are defined by federal NSPS regulations. In addition, many state permit programs exclude physical changes that are considered RMRR from new source permitting provisions. Therefore, sources that have already completed overhauls pursuant to subparts GG or KKKK could now be considered to have made non-routine RMRR that trigger minor NSR provisions and could be required to go through NSR permitting, retroactively.

For example, one CIBO member faces just those circumstances. The source had the option either to complete an engine overhaul or install a new turbine engine. Because the cost for either the overhaul or the engine replacement were similar and represented a fraction of the replacement costs of the affected facility, the agency concluded that the engine replacement constituted routine maintenance (not reconstruction) for the turbines. Because the engine replacement was RMRR, it was exempt from minor new source permitting. In this case and many others, the existing engine is regulated under subpart GG, but permitted emission limits are well below those required by subpart KKKK. Thus, the older turbine engine which required overhaul or replacement with a new engine is already permitted with emission limits *lower* than subpart KKKK standards. However, because the new engine would be more reliable than the overhauled engine, fewer shutdowns and swap-outs would be needed and emissions associated with start-up, shut-down, and malfunction (SSM) events would be lower. Thus, the engine replacement resulted in lower actual emissions of criteria pollutants. The outcome was positive by any measure.

Had that overhaul or engine replacement been considered reconstruction rather than routine maintenance, the source could not have undertaken the upgrade. That is because the same project defined as a “reconstruction” would have triggered minor NSR. To comply with NSR, the source would have to install a Selective Catalytic Reduction (SCR) on the unit and make even steeper emissions reductions. The unit has physical and operational constraints that make

SCR and further emission reductions impossible. Therefore, the source would not have upgraded the turbine engines, because it could not have met the additional requirements that would have been triggered by reconstruction. This example demonstrates that EPA's proposal to redefine as "reconstruction" what is now RMRR will have actual negative environmental effects, because cogeneration at this facility would no longer be economically viable.

EPA's new interpretation would change the economic landscape for existing facilities that installed CHP based on the 2006 rule. Sources that invested in CHP technologies based their decisions and financing on a certain expected return on the investment in the technology. A declaration now that applies subpart KKKK standards retroactively could strand those investments. Some sources, for which upgrades to meet KKKK standards are not feasible, would be forced to abandon the CHP improvements and close the unit.

There are many different makes and models of combustion turbines. Not all of those units can apply water or steam injection control technologies to the high levels that would be required to meet subpart KKKK standards. Nor can all of those units install add-on SCR controls. SCR must be installed at a specific point in the gas path so that the gas temperatures match requirements for this technology. It is no simple matter to install a new SCR unit in an existing turbine system. Another option that can be considered is replacement of a diffusion flame engine with a dry low NO_x (DLN) engine. It is important to point out that this technology is not available for every turbine make and model. Further, it is no simple matter to replace a diffusion flame combustion turbine with a lower emitting DLN combustion turbine engine. The control systems and configuration of DLN technology are very different from the more traditional diffusion flame combustion technology. Replacement of diffusion flame with DLN would require changing all auxiliary systems – lube oil system, gas compression systems, control systems, piping arrangements, etc. Thus, DLN engine technology or SCR add-on control technologies are best employed when a new engine is installed and the entire turbine generating system is designed from the ground up. These technologies generally are not suitable for employing during reconstruction or in lieu of an overhaul. Thus, facilities currently operating diffusion flame turbine engines that cannot be modified and operate reliably at high steam or water injection levels, often will not be able to readily be upgraded to meet subpart KKKK standards.

If EPA now requires torturous upgrades (because it has redefined routine turbine maintenance as reconstruction), the more cost-effective path for many facilities will be to simply abandon the use of the CHP. EPA fails in its rulemaking to consider these effects on existing sources, how many sources may be affected in this way and what the ultimate environmental and energy impacts would be. If EPA pursues this approach, they will be ignoring these substantial implications on existing and future turbine, cogeneration and CHP installations throughout the country.

This would discourage the further deployment of CHP.

This administration has declared strong commitment to energy efficiency and in particular CHP technology. President Obama pledged in his Executive Order *Accelerating Investment in Industrial Energy Efficiency*, to encourage widespread adoption of the technology.⁵ August 30, 2012.

EPA's proposed definition of affected source will work directly against these goals of incentivizing the conversion to CHP. The specific example described above applies equally to routine maintenance taken in the recent past as it does to planned future routine maintenance. In order to avoid triggering reconstruction and other requirements that may not be feasible, sources will decide not to undertake future routine maintenance that would increase their energy efficiency and yield greater environmental protections.

The proposed definition of affected source will require existing units that employ CHP technology to meet new unit standards under KKKK when making repairs, even when the CHP unit was never designed to meet such new source limits. As described above, use of certain emission lowering technologies is not feasible in many cases and would leave many of these facilities with limited options. They would either discontinue operation of the CHP when such a repair is required or entirely redesign controls, piping and other components of the combustion turbine affected unit to employ dry low NOx if that technology is even available for the make and model of turbine or find a way to retrofit the entire process to employ SCR. These draconian options would be required for all instances where the particular makes and models of turbine engines are not capable of operating with high levels or water or steam injection needed to meet KKKK.

⁵ Executive Order *Accelerating Investment in Industrial Energy Efficiency*, August 30, 2012 <http://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency>.

The facts of another CIBO member demonstrate this situation. The plant operates two simple cycle turbines that burn natural gas or ultra-low sulfur diesel fuel oil and require overhauls every one to two years. Were the overhauls to be considered reconstruction under any alternative EPA proposes, the plant would be required to install SCR systems, at a cost that would negate the cost advantage of using the combustion turbines. Under that scenario, instead of overhauling the turbines, the plant would retire the turbines and replace them with an idle pet coke boiler. Not only would the efficiencies of the turbines be lost, but the replacement source would have higher pollutant emissions than the turbines.

Requiring more substantial changes to many combustion turbine units will cause them to forego maintaining the CHP technology because the cost of the upgrades beyond the CHP to meet new source standards will not be possible or economically feasible. EPA does not address any of these operational challenges in its analysis and that imposition of new source standards on existing units is not rational.

This proposal has already had a chilling effect on planned projects. One CIBO member is in the middle of a planned installation of a CHP unit that would result in efficiency gains and long term emission reductions. Now with the uncertainty that the project may require the facility to be permitted under subpart KKKK, the facility has stalled decision making on the upgrade. EPA has suddenly injected uncertainty into decision making on efficiency upgrades under NSPS, yet at the same time emphasizes its commitment to encourage increased efficiency. Facilities will not install CHP units if in exchange they must risk noncompliance or finance upgrades that cost more than the efficiencies gained.

In addition, the fact that NSR works counter to the goal of encouraging the adoption of energy efficient technologies is well understood, including by EPA.⁶ For that reason, not only will the

⁶ See EPA, NSR Report to the President (2002), www.epa.gov/NSR/documents/nsr_report_to_president.pdf for these and other statements:

- “Government officials from both major political parties and industry groups have expressed the belief that the NSR program is unnecessarily complicated and often serves as an unnecessary obstacle to environmentally beneficial projects in the energy sector, such as those that improve energy reliability and efficiency and promote the use of renewable resources.”

possibility of new source standards deter CHP enhancements, so will the triggering of minor NSR, which will also occur under EPA's proposed change.

EPA's engine-only definition of affected source does not logically reflect the composition of a turbine facility and unnecessarily complicates compliance.

This approach illogically carves up a source, focusing on one of all of its multiple interdependent parts. A turbine includes many components beyond the turbine engine in order to function. For example, support systems required for turbine operation include control systems, air and gas piping systems, complex lubrication systems, air inlet and cleaning systems. All of these support systems are required in order for the unit to function. The engine and all ancillary elements are logically what constitute the turbine, and what should continue to define the affected facility. This approach strains the longstanding NSPS reconstruction definitions and applicability criteria.

This departure from the historical definition also creates a precedent for future NSPS rules and two separate accounting systems between MACT and NSPS standards. Facilities operating under the definition of "reconstruction" in 40 CFR 60 Subpart A could trigger the rule unknowingly and be forced to install controls, conduct annual performance tests, install CEMS at added unanticipated costs

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- "As applied to existing power plants and refineries, EPA concludes that the NSR program has impeded or resulted in the cancellation of projects which would maintain and improve reliability, efficiency and safety of existing energy capacity. Such discouragement results in lost capacity, as well as lost opportunities to improve energy efficiency and reduce air pollution."
 - "EPA concludes that concern about the scope of the routine maintenance exclusion is having an adverse impact on projects that affect availability, reliability, efficiency, and safety. Changes to the NSR program that add to the clarity and certainty of the scope of the routine maintenance exclusion will improve the process by reducing the unintended consequences of discouraging worthwhile projects that are in fact outside the scope of NSR."
 - "In general, the EPA encourages efficiency improvements wherever feasible. However, the scope and magnitude of some of the kinds of changes, their impact on recovering capacity that had been lost to deterioration of equipment, their impact on significantly extending the life of the boiler, turbine, etc., and the resulting significant emissions increase, necessitates that certain projects which may result in efficiency improvements, must be reviewed under NSR. Though projects of this magnitude still may go forward once their air quality impacts are addressed, the EPA finds that NSR can discourage companies from undertaking them."
 - "Overall, the comments received from industries other than utilities and refineries also provide additional evidence suggesting that the current NSR program is having an adverse impact on energy efficiency by discouraging projects that may improve energy efficiency, or may increase capacity and reliability without actually increasing pollutant emissions."

and be subject to enforcement. The Turbine MACT rules were adopted, the affected facility definition was intentionally broad, in keeping with past interpretations of the NSPS to prevent triggering the new source MACT standards when maintenance is done. If EPA makes this change, will also be departing from MACT affected facility precedent. Nowhere does EPA acknowledge this and other implications of its proposed rule, which deprives sources of notice and the ability to comment on regulatory changes.

Other CAA provisions are already forcing emission reductions that often surpass Subpart KKKK limits.

Most new installations of turbines require more stringent controls than the levels of control required by subpart KKKK. This is because most states apply more stringent state Best Available Technology (BAT) requirements on new sources. In addition, Best Available Control Technology (BACT) applies to existing sources under certain circumstances and Reasonably Available Control Technology (RACT) applies to existing combustion turbine installations in many areas of the country. BAT and BACT programs ensure that new sources install the lowest emitting cost-effective controls that minimize emissions when the emission unit is initially installed. These controls are generally well below the levels specified under KKKK. RACT programs ensure existing turbines are retrofit to reasonably available control levels in many parts of the country where NO_x controls are required in ozone non-attainment areas. In its rule, EPA is attempting to force retrofit requirements on existing sources through NSPS standard revisions. EPA proposes to do this by redefining reconstruction so that it triggers subpart KKKK applicability when facilities perform activities that are required to repair and maintain existing turbine equipment. EPA lacks the authority to mandate RACT requirements nationwide for turbines through the NSPS program. Moreover, the NSPS and RACT programs have very different purposes and NSPS is not an appropriate vehicle for EPA to accomplish its RACT objectives. EPA has not accounted for emission reductions attributable to programs other than NSPS such as BAT, BACT and RACT and therefore has not accurately assessed the environmental benefit that will actually be derived from the proposed changes to its rule.

The proposed alternative to defining reconstruction – a bright-line definition based on the third major overhaul – is inconsistent with the Clean Air Act and should not be adopted.

This is contrary to the Clean Air Act, which applies NSPS to new sources, including where “the construction or modification” of the source begins after publication of the regulations. 41 USC §7411. Each overhaul -- to the extent it can be considered construction at all -- constitutes a single project under the statute. EPA would combine three separate overhauls to mean “the construction” of a source, which is an unsupportable departure from the statutory text. This bright line alternative, like the underlying reconstruction amendment, also focuses too narrowly on the engine as the basis for determining whether a unit is reconstructed. It is also arbitrary and not fact-based. Overhauls are normal maintenance functions recommended by the combustion turbine manufacturers to maintain operational reliability and not to extend the life of the unit. An additional failing is that it does not reflect the range of turbine operations. Units with certain configurations or controls, for example units that use more water or steam injection to reduce NO_x emissions, require more maintenance. Those units would be singled out for more onerous treatment, even if their additional technologies actually result in lower emissions. Overall, the approach would penalize the more well controlled sources which require more frequent overhauls.

Even worse, units with high levels of water or steam injection, needing more frequent overhauls, are most likely already meeting the tighter NO_x limits that would be imposed under subpart KKKK. The fact that EPA’s proposal will penalize lower NO_x units that coincidentally are overhauled more often will serve no environmental benefit but will likely discourage use of CHP.

The alternative would also transform routine maintenance into repeated construction permitting procedures. Once a source becomes subject to subpart KKKK upon the third overhaul, and thereafter, prior to each third major overhaul, the source would trigger reconstruction provisions which would not be considered RMRR upon these changes and thus the source would need to go through major or minor NSR permitting. The approach adds regulatory complexity and even more substantial costs in order to maintain current operations. EPA has not evaluated the additional environmental benefit of that increase in NSR permit processing. It would appear to yield marginal or no additional emission reductions. Nor has EPA evaluated these costs. EPA has assumed incorrectly that this proposal does not result in substantial additional costs. 77 FR 52559.

II. THE NO_x COMPLIANCE AVERAGING TIMES SHOULD NOT BE SHORTENED.

EPA proposes to limit the use of the 30-day averaging period for combined cycle and CHP turbines regardless of whether they comply with input or output-based standards. EPA states that NO_x emissions from combustion turbines are relatively stable and the 30-day averaging time is unnecessary. 77 FR 52559. EPA proposes to require stationary combustion turbines (including combined cycle and CHP turbines) that elect to comply with input-based standards to use the 4-hr (or daily) averaging period. EPA states that the current rule does not allow simple cycle turbines the option of demonstrating compliance with a 30-day averaging period. 77 FR 52559.

CIBO opposes reducing the current 30-day average compliance period for input-based standards to a 4-hour or even a daily average period. An important consideration is that this rule requires start-up and shut-down emissions to be included in the averaging periods. For units that have periodic start-ups or load changes, inclusion of these periods effectively tightens the standard and as noted below, CIBO opposes this provision.

It is also important to note that state BAT emission limitations are often much more stringent than the federal NSPS standards. For instance several permits for recently installed turbines CIBO is aware of were required to meet stringent state BAT limits for NO_x of 2.5 ppm, averaged over a 30- day basis, which is much more stringent than subpart KKKK limits. States allowed this averaging period because it was in the NSPS standards. Given the limit is so challenging, it would be very difficult to meet the 2.5 ppm limit if it was based on a 4-hr average or even a daily average. This compliance would be even more challenging if start-up or shut-down emissions were included in those averages. These new sources fall under current subpart KKKK requirements and should not be required to maintain duplicative monitoring to ensure they meet both the much higher NO_x with a 4-hr average as well as the much lower NO_x limit with a 30-day average that comes from the BAT limits. In addition, future BAT limits required by states will likely pick up the lower 2.5 ppm standards, but states will be reluctant to allow a 30-day averaging period if EPA removes this averaging period from the NSPS. Thus, sources may be faced with the impossible challenge of meeting new source limits as low as 2.5 ppm, but with averaging times so short that continuous compliance will be impossible. Thus, CIBO urges EPA not to reduce the compliance averaging times found in subpart KKKK.

EPA also requests comment on changing the classification of large and small for turbines operating at part load. 77 FR 52558. EPA offers no environmental or other justification for this change. Changing the current subpart KKKK classifications in 2012 or later, well after these standards became applicable to sources, would only complicate regulatory applicability assessments that have been made. EPA should not revise criteria in a way that changes the emission limits that apply to current and future subpart KKKK sources.

III. EPA SHOULD NOT MANDATE INCLUSION OF START-UP AND SHUT-DOWN EMISSIONS IN ITS DEFINITION OF CONTINUOUS COMPLIANCE.

For affected facilities for which construction, modification or reconstruction commenced after August 30, 2012, EPA proposes to explicitly require in 60.4320 (e) that NO_x emissions standards “would apply at all times when the affected facility is operating, (including periods of startup, shutdown, and malfunction).” EPA proposes in the same section that startup shutdown and malfunction emissions would not be included in the NO_x emissions standards for affected facilities for which construction, modification or reconstruction commenced before August 30, 2012. 77 FR 52565.

While CIBO appreciates that at least in this case, this provision to include startup and shutdown emissions would not apply retroactively, EPA’s proposal to require inclusion of start-up, shutdown and malfunction emissions to be added to normal operating emissions for purposes of complying with the existing NO_x emissions standards is problematic for a number of reasons.

First, EPA is proposing to radically modify its definition of what is new or what is reconstructed by narrowing the longstanding definition of affected unit or mandating that after several overhauls units are considered new or reconstructed. Therefore, existing units which are currently subject to subpart GG or even subpart KKKK but have current permit exclusions that exclude startup and shutdown periods from normal operating emissions so that NO_x compliance is demonstrated without the inclusion of these SSM emissions would be also be affected by this proposed change. It is critical to note that many turbines use steam injection and SCR

technologies to reduce NOx emission. These units were not designed and simply cannot meet emission limits for a period of time after startup or before complete shutdown.

One example is the startup of a diffusion flame stationary combustion turbine in a cogeneration facility that generates steam for use at the facility as well as for steam injection in the turbine engine itself. This unit also has installed SCR installed to meet challenging state permit requirements. In this case, while the turbine is starting up, it takes time for the hot air discharged from the turbine to generate steam necessary for NOx emission reduction in the turbine itself. In addition, it takes time for exit temperatures of the hot air in the SCR ductwork to stabilize at the proper temperature necessary for effective SCR NOx reduction. There is no way for this type of system or many similar systems to come anywhere close to meeting its NOx emission limits during startup or shutdown. For this reason, based on CEM data its permit has excluded startup and shutdown emissions and even load change emissions from compliance requirements. Because it is not technically feasible to meet limits during these periods, these exemptions were included in SIP approved turbine retrofit rules when they were promulgated.

In any event, regardless of how well this turbine is maintained, it will not be possible for this unit to meet proposed emission limits during startups or shutdowns. Yet, because EPA will declare this unit to be “new” or “reconstructed” under the proposed revisions to subpart KKKK once several overhauls are completed, this unit would no longer be able to demonstrate compliance with its NOx emission standards once subpart KKKK becomes applicable and trumps these permit and local rule provisions. CHP facilities would thus face the untenable situation of not being able to meet emission limits. Another CIBO member has units with limits as low as 2.0 ppm that can meet those limits on a long-term average basis, but could not meet those limits if startup or shutdown emissions were included in those limits. Many facilities share these circumstances.

Second, NSPS requirements have generally been established over the years based on emissions during source tests at steady state conditions. Thus, the general provisions of NSPS at CFR Part 60.8 (c), highlights that emission limits do not apply during start-up, shutdown and malfunction.

(c) Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such records as may be

necessary to determine the conditions of the performance tests. *Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.*

Neither the current emission standards in subpart GG, nor the more recent emission standards in subpart KKKK included these startup or shutdown emissions while setting the emission limits. Therefore, EPA cannot simply propose to add those emissions without re-establishing the entire standard. EPA has not done this and therefore cannot simply conduct a cursory analysis and propose to make such drastic changes to the fundamental standard. The current subpart KKKK recognized this and instead finalized a rule that requires at 40 CFR 60.4333 (a) that:

You must operate and maintain your stationary combustion turbine, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunction.

EPA should not change course here.

Third, EPA proposes that the part-load NO_x emission standard apply during periods of start-up and shutdown (SU/SD) operation. 77 FR 52558. This is simply inappropriate. Startup and shutdown operations are very different than operating a turbine at part-load. Part-load operation is a steady state operation – it differs vastly from startups and shutdown which are transient periods. As discussed above in the diffusion flame example above, controls required to reduce emissions are not in proper operation during these transient periods. Starting a dry low NO_x combustor is even more challenging because the turbine transfers through a number of transient operations. It is therefore inappropriate to apply a part-load emission standard during these periods of operation.

If EPA wants to establish appropriate and representative start-up and shutdown emission standards, they would need to establish specific standards for those transient periods, across the full range of regulated turbines, installations and fuels, based on an accurate assessment of equipment capabilities.

States look to EPA standards not only when considering what emissions averaging periods should apply, but also for deciding whether to discontinue startup and shutdown exclusions in permits and local rules. The vast majority of newer units have much more stringent emissions limitations than those of subpart KKKK. While it would be challenging to meet emissions limits with subpart KKKK, if those limits included startups and shutdowns, it would be impossible for units subject to emission limits 10 times lower than those of subpart KKKK to meet those limits if emissions of startups and shutdowns could no longer be excluded.

Finally, EPA asks whether it is appropriate to presume that operating the first 30 minutes would be considered part-load operation. This is inappropriate. Combined cycle start sequences are fundamentally controlled by the steam turbine bottoming cycle thermal requirements times. Additionally, post combustion controls such as SCR s and CO catalysts have a warm-up period that must be considered before they become fully operational. For a cold start, in which the plant has been shutdown for an extended period and the equipment is all at ambient temperature, a combined cycle plant start can require 3 hours or more to reach full operation. The use of a blanket assumption that a plant will start within 30 minutes does not reflect the operational realities of a facility and is clearly not appropriate.

In short, startup and shutdown emissions should not be included in the averaging of the total emission signature of a combustion turbine.

IV. SO₂ LIMITS SHOULD BE PRESUMPTIVELY MET BY SOURCES USING PIPELINE QUALITY NATURAL GAS.

The current provisions of 40 CFR 60 Subpart KKKK §4365 provide the following exemption from monitoring total sulfur content of fuel:

§4365 How can I be exempted from monitoring the total sulfur content of the fuel?

You may elect not to monitor the total sulfur content of the fuel combusted in the turbine, if the fuel is demonstrated not to exceed potential sulfur emissions of 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for units located in continental areas and 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for units located in non-continental areas or a continental area that the Administrator determines does not have access to natural gas and that the removal of sulfur compounds would cause more environmental harm than benefit. You must use one of the following sources of information to make the required demonstration:

(a) The fuel quality characteristics in a current, valid purchase contract, tariff sheet or transportation contract for the fuel, specifying that the maximum total sulfur content for oil use in continental areas is 0.05 weight percent (500 ppmw) or less and 0.4 weight percent (4,000 ppmw) or less for non-continental areas, the total sulfur content for natural gas use in continental areas is 20 grains of sulfur or less per 100 standard cubic feet and 140 grains of sulfur or less per 100 standard cubic feet for noncontinental areas, has potential sulfur emissions of less than less than 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for continental areas and has potential sulfur emissions of less than less than 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for noncontinental areas; or

(b) Representative fuel sampling data which show that the sulfur content of the fuel does not exceed 26 ng SO₂/J (0.060 lb SO₂/MMBtu) heat input for continental areas or 180 ng SO₂/J (0.42 lb SO₂/MMBtu) heat input for noncontinental areas. At a minimum, the amount of fuel sampling data specified in section 2.3.1.4 or 2.3.2.4 of appendix D to part 75 of this chapter is required.

For many sources that comply with the subpart KKKK SO₂ requirements through the current initial natural gas demonstration, or through purchase contract, tariff sheet or transportation contract specifying sulfur content, a permit limit that allows for the Subpart KKKK exemption would add monitoring not currently being conducted. Given the sulfur specification (20 grains per 100 standard cubic feet) is a standard pipeline specification, and turbines receiving natural gas by pipeline burn only fuel that meets this pipeline specification, there is no need for further monitoring. While EPA suggests that the amendment would reduce the burden for owner/operators, it does not.

EPA should simply exempt turbines burning natural gas received by pipeline with a sulfur specification of 20 grains per 100 standard cubic feet or less. This exemption is already allowed under Subparts GG and KKKK, and appropriately recognizes the inherently low SO₂ emissions from such units burning such fuel. EPA should likewise exempt units burning ultra-low sulfur diesel fuel oil, which has a sulfur content of 15 ppmw or less.

V. AN INITIAL PERFORMANCE TEST SHOULD NOT BE REQUIRED EACH TIME AN ENGINE IS SWAPPED OUT.

EPA proposes that any engine that exchanges the combustion turbine engine for an overhauled combustion turbine engine as part of a turbine exchange program must conduct an initial performance test. Section 60.4333(b)(6). CIBO opposes this provision. A source should not be required to conduct a source test every time it replaces its engine on a temporary or permanent basis with a the same make

and model engine that is designed to meet the same emission limits. While different engine manufacturers have a variety of engine exchange provisions, all sources exchange engines on a frequent basis. Simple parts replacement to restore the unit to its nominal level of performance should not generate a need for emission testing.

At a minimum, EPA should agree that there is no need to conduct a source test each time a major overhaul or parts of the combustion engine are replaced, especially for facilities that use a CEMs to measure NO_x emissions. In some situations, the CEMs are certified monitors, that conduct a RATA once per year, and are calibrated routinely. Therefore, it is costly and of no environmental benefit to be required to conduct a source test each time parts are replaced when the facility uses a CEMs to measure NO_x emissions. In addition, while many units may employ water or steam to fuel ratio following an initial source test correlation to demonstrate compliance, there is no need to mandate confirmation of that ratio via source test every time those sources conduct an engine swap-out. Where flame diffusion technology is utilized, and the same make and model engine is used there is simply no need to re-test every time the same make and model unit is installed.

VI. A NO_x CEMS SHOULD NOT UNCONDITIONALLY REQUIRE THE USE OF A STACK FLOW METER.

Section 60.4345(a)(3) specifies that a source using a NO_x CEMS that elects to comply with the input based emissions standard, must install, calibrate, maintain and operate either a:

- (a) Continuous Monitoring System (CMS) to continuously monitor and record fuel flow; or
- (b) CEMS to continuously monitor and record diluent (oxygen or carbon dioxide) concentration (percent by volume, %v) and a stack gas volumetric flow, used to calculate heat input in million British thermal units per hour (MMBtu/hr)

EPA should not mandate use of a stack flow meter for continuous compliance where it is not needed. Neither subpart GG or the current subpart KKKK mandate use of a stack flow meter for continuous compliance. A stack flow meter is not necessary for accurate determination of emissions. If EPA requires this, it will pose substantial challenges for existing facilities that are currently subject to subpart KKKK or could in future be subject to this subpart.

The proposal would subject many existing subpart GG sources, which have installed Part 60 CEMS rather than monitor water to fuel ratio, to install Part 75 monitors with stack gas volumetric flow requirements. In many existing stack configurations where CEMS are installed and operating today, stack configurations are not consistent with Part 75 standards for gas flow measurements. In those cases, gas volumetric flow readings measured with a CEMS would be inaccurate without very costly entire stack reconfigurations. For example, one CIBO member has a subpart GG gas-fired cogeneration unit whose stack configuration is accurate for ppm readings and RATA testing, but who must substitute F factor to calculate mass during all source tests. At this facility gas flow readings read twice the actual level when measured during source tests with instrumentation rather than as calculated from natural gas combustion. This is because the stack has turns upstream and downstream of the test port location so the existing stack does not meet CEMs placement guidelines for obtaining accurate gas flow measurements. Reconfiguring the stack to meet these requirements is not technically feasible at that facility.

At other sites that may be able technically to modify stack configurations, it would be cost-prohibitive to modify stacks to obtain an accurate flow measurement following engine overhaul work, and under this proposal could convert subpart GG sources to subpart KKKK sources. More fundamentally, EPA has not assessed the cost burden on sources that would be affected subject to these reconfigurations, nor has it demonstrated the environmental or compliance benefit to be gained where the units already employ CEMS. This change will unnecessarily increase the stringency and cost of monitoring requirements whenever subpart KKKK applicability is triggered yet it will not improve the accuracy of the emissions data.

VII. EPA SHOULD NOT ADOPT AN OUTPUT STANDARD THAT IS BASED ON NET OUTPUT RATHER THAN GROSS OUTPUT.

EPA has decided to incorporate into the final rule an output based standard that uses net power rather than gross output as is currently specified. 77 FR 52558. To account for parasitic loads, EPA has proposed to lower the efficiency used in the output based standards by 2.5 percent and require the source to determine parasitic loads. The only comment EPA is requesting is how the parasitic load is to be determined. EPA has not presented any data to substantiate that this change will result in any improvement to ambient air quality. This change introduces complexity and increases compliance

burden with no corresponding environmental benefit. Rather than foreclose comment by sources on the wisdom of this approach, EPA should invite comment and provide its data and analysis that support what now is an unsupported requirement.

CONCLUSION

For all of the foregoing reasons, EPA should not adopt the proposed amendments to the definition of affected source for purposes of determining whether an overhaul constitutes routine maintenance or reconstruction, and should adopt changes to the rule consistent with these comments.