April 15, 2025

TO: U.S. ENVIRONMENTAL PROTECTION AGENCY
FR: THE INSTITUTE OF CLEAN AIR COMPANIES
RE: EPA-HQ-OAR-2024-0419

The Institute of Clean Air Companies (ICAC) appreciates the opportunity to offer comments in response to EPA's Review of New Source Performance Standards (NSPS) for Stationary Combustion Turbines and Stationary Gas Turbines. ICAC is a national trade association of companies that supply greenhouse gas management, air pollution control and monitoring systems, equipment, and services for stationary sources. For 60 years, ICAC member companies have helped to clean the air by developing and installing reliable, cost-effective environmental control and monitoring systems.

We support technology-neutral and flexible policies that enable cost-competitiveness and a diverse set of technologies to compete in the market. As the EPA evaluates the NSPS for stationary combustion turbines and stationary gas turbines, ICAC would like to provide comments on the Regulatory Impact Analysis (RIA).

ICAC appreciates the opportunity to offer comments on this notice of proposed rulemaking, and we look forward to answering any further questions should EPA seek additional information.

Best regards,

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Introduction

The Institute of Clean Air Companies (ICAC) appreciates the opportunity to respond to the Environmental Protection Agency's EPA's Review of New Source Performance Standards for Stationary Combustion Turbines and Stationary Gas Turbines.

ICAC is a trade association headquartered in Arlington, VA, and represents more than thirty companies in the air pollution control, greenhouse gas management, and emissions measurement industry. ICAC members have successfully developed and deployed solutions to address emissions challenges for more than 60 years and are uniquely positioned to provide their expertise on emerging clean technologies and advancing clean technology markets. ICAC members have successfully commercialized solutions for the industrial, power, oil and gas, and maritime sectors, and have worked to address challenges that emerge at the nexus of air and water pollution management. Pollutants managed by member technologies include mercury, acid gases, PM, NOx, SOx, VOCs, HAPs, GHGs, HCl, and coal ash. Our members have operations in all fifty states and range from multi-national corporations with thousands of employees to small businesses focused on local emission challenges.

ICAC's comments will focus on the Regulatory Impact Analysis for the NSPS Review for Stationary Combustion Turbines (RIA link here) as well as subparts KKKK and TTTT of the proposed amendments to the regulation. This includes:

- Clarification of the table of combustion turbines constructed 2019-2023, particularly number of simple cycle turbines with SCR
- Cost effectiveness of the load capacity factor
- Clarification on rolling hour average, start-up and shut-down conditions

We recognize that EPA staff have worked diligently in its review of the NSPS. We would welcome the opportunity to engage EPA on the items discussed below to ensure the agency has appropriate technical support from industry as it continues its work.

Comments

Clarification of the table of combustion turbines constructed 2019-2023

After reviewing the RIA analysis on projected growth of combustion turbines, page 21, Table 6, ICAC believes a few points need clarification. High temperature SCR remains BESR for larger combustion turbines in power applications. It is important to note that air dilution has become a relied upon method for simple cycle units to cool flue gases to the optimal temperature for catalysis. High temperature SCR installed in the early 2000's on simple cycle frame turbines may no longer operate today.

Table 6 Types of Combustion Turbines Constructed 2019-2023 and Installed Controls

Turbine Type	Total Number of Simple Cycle Turbines	Number of Simple Cycle Turbines with SCR	Total Number of Combined Cycle Turbines	Number of Combined Cycle Turbines with SCR
≤ 250 MMBtu/h	31	1	6	5
> 250 MMBtu/h and ≤ 850 MMBtu/h	70	59	3	3
> 850 MMBtu/h	23	11	50	50
Direct Mechanical Drive	52	0	0	0
Total	176	71	59	58

Cost Effectiveness of the Load Capacity Factor

The RIA does not mention dilution air for frame units. Aeroderivative can use "standard" catalyst for NOx control. However, with frame simple cycle units there are two options.

1) use high temperature catalyst with a significant cost verses standard catalyst.
2) use of dilution air with "standard" catalyst.

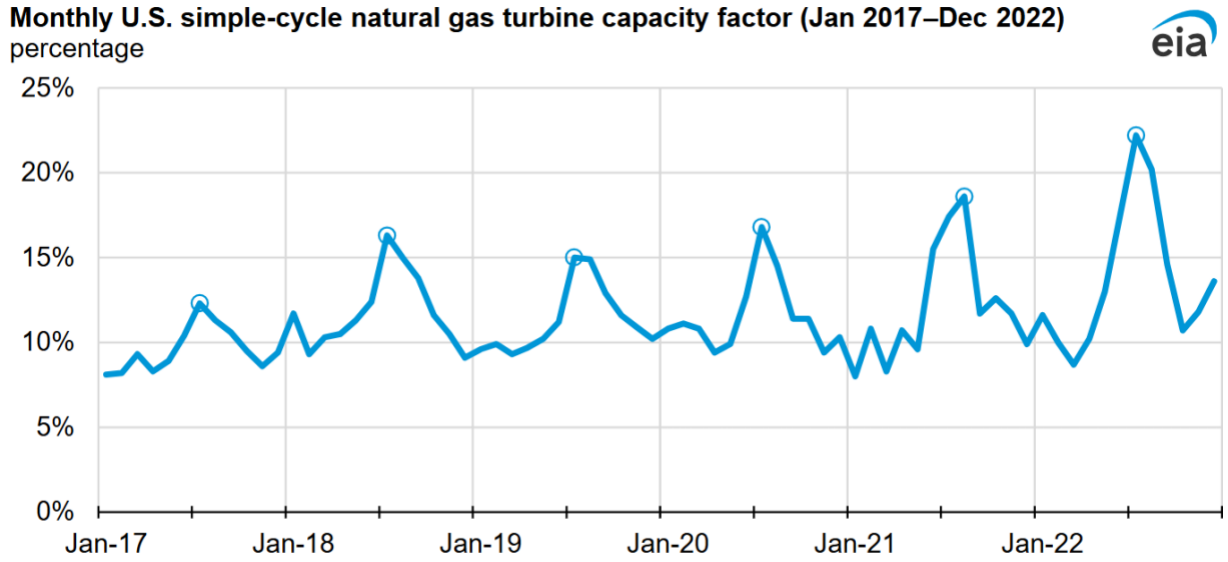
There is a capital cost for the dilution air fan and system, but the catalyst costs are less. There is also a decrease in plant efficiency due to the large dilution air fan. ICAC could not determine if the costs for the dilution air systems are included in the RIA. While the high temperature catalyst technology is available, the dilution air system is the preferred technology employed today.

Aeroderivative turbines are smaller and have had some high temperature catalysts applied. As the system gets larger, the impact of higher catalyst volume and price starts to become significant. EPA should consider the ability to use dilution air as a control strategy to allow the use of standard temperature SCR catalysts. EPA should also consider whether there is a difference if it is prime power or peaking.

In the past, high temperature SCR catalysts were iron beta zeolites. Newer copper zeolite SCR (very prominent in the auto industry) has been developed. An extruded copper zeolite has also been developed for power applications with a much broader temperature range (300-500°C). They have been installed in diesel engines and now several gas turbine applications. This raises new considerations for EPA to address the question of durability and the price is more economical than coated high temperature SCR catalysts (although still more expensive than standard V SCR).

Simple cycle aeroderivative turbine that are 25 ppm or higher for NOx are commonly getting SCRs today. The need to get to less than 15 ppm also requires the advanced class turbines (H & J) to use SCR to abate their 25 ppm of NOx. LAER does not require SCR for simple cycle turbines operating for less than 3,000 hours. New F-class turbines do not require SCR as they are not economically feasible with the recent SCR costs experienced in the market. Recent permitting studies have place the $/ton NOx over $50,000/ton.

While it may be easy to add a SCR on an aeroderivative turbine, this is not the case for frame units. Medium temperature catalysts still use dilution air.



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Emission standards should remain ppm-based because they are the most representative and broadly applicable standard with an ability to utilize the lb/MMBtu standard if an applicant so chooses to pursue it. This approach works equally well across fuel types including hydrogen (H_2) and non-methane gaseous fuels. Hydrogen and other non-methane gaseous fuel should be allowed to utilize a correction factor to account for higher oxygen and moisture contents which bias the NO_X CEMS measurements high.

EPA proposes to subcategorize small, medium, and large combustion turbines as low load, intermediate load, or base load units based on annual capacity factors. Low load combustion turbines would have annual capacity factors less than or equal to 20 percent, intermediate load combustion turbines would have annual capacity factors greater than 20 percent and less than or equal to 40 percent. As shown in the EIA Monthly U.S. Simple Cycle Gas Turbine Capacity Factor graph above, an increasing trend in capacity factor is clearly indicated. This makes sense as these simple cycle natural gas turbines provide additional balancing resources to integrate rapidly expanding solar capacity. This trend is very likely to continue as solar power continues to see significant deployment over the next 10 years and thus the technologies are closely correlated. If the simple cycle capacity is not available (due to restrictions placed on operations), then they are likely to see future curtailments just because the overall power systems cannot handle both the load swings and peaking requirements. Inability to deliver balanced wind / solar/ BESS / simple cycle natural gas would result in the equivalent grid capacity being provided by combined cycle or coal plants.

Power companies already have significant incentives (up to 30% O&M costs) through differences in efficiencies between simple cycle and combined cycle fuel utilization. EPA artificially restricting unit utilization will require curtailment of solar/wind or the installation of more simple cycle natural gas units. EPA proposing to implement this entirely disregards the unnecessary Scope 2 and Scope 3 emissions and rate affordability that an additional power plant embodies.

Clarification on Rolling Hour Average, Start-up and Shut-down Conditions

Comments from the Proposed Rule

For the purposes of subpart KKKK, the EPA refers to stationary combustion turbines as small (base load ratings of less than or equal to 250 MMBtu/h of heat input), medium (base load ratings of greater than 250 MMBtu/h of heat input and less than or equal to 850 MMBtu/h), and large (base load ratings of greater 850 MMBtu/h of heat input), respectively. In addition, the EPA is proposing to further subcategorize small, medium, and large combustion turbines as low load, intermediate load, or base load units depending on 12-calendar-month capacity factors. Low load combustion turbines would be those with a 12-calendar-month capacity factor of less than or equal to 20 percent. Intermediate load combustion turbines would be those with a 12-calendar-month capacity factor of greater than 20 percent but less than or equal to 40 percent. Base load combustion turbines would be those with a 12-calendar-month capacity factor greater than 40 percent.

For combustion turbines in the subcategory of sources with greater than 50 MMBtu/h of heat input and less than or equal to 850 MMBtu/h of heat input, the BSER in subpart KKKK is combustion controls available for aeroderivative combustion turbines, because, when subpart KKKK was proposed in 2005, the largest aeroderivative combustion turbines were less than 850 MMBtu/h. ICAC recommends longer averaging times over shorter ones, particularly if the trend continues toward peaking operations to accommodate additional solar generation capacity. As noted, 4-hour rolling average has been the standard under KKKK and has proved workable. We would urge EPA to consider use of averaging times longer than 4 hours. However, consistency across averaging times outweighs the benefits of lengthening only some. Use of multiple averaging times to determine compliance makes reporting messy and creates compliance challenges for the operators required to look at multiple limits for the same pollutant to ensure they comply with their permits.

ICAC suggests that the one hour part-load standard is problematic. The SCR does not operate in start-up and shut-down conditions due to requirements for the unit to achieve and maintain operational temperatures. A one-hour averaging period means that units will regularly be in non-compliance, especially if both a start-up and shut-down occur within the one hour time-frame.

Conclusion

ICAC remains committed to regulatory actions that support environmental stewardship and protect human health. ICAC member companies are proud of their role in helping to clean the air by developing and installing reliable, cost-effective control and monitoring systems that have enabled compliance with environmental requirements. In addition to mercury, ICAC has achieved reductions across a broad range of pollutants, including NOx, SOx and particulate matter, as well as VOCs, acid gases and a host of other toxic air pollutants. ICAC would welcome the opportunity to meet with EPA to address or clarify any issue

raised in these comments. We are ready to assist EPA in further cost-effective air pollution reduction efforts.