BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
	)	R 23-18
AMENDMENTS TO 35 ILL. ADM. CODE	)	(Rulemaking – Air)
PARTS 201, 202, AND 212	)	

NOTICE OF FILING

TO: Mr. Don A. Brown,
Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street,
Suite 11-500
Chicago, Illinois 60601

Timothy Fox
Chloe Salk
Hearing Officers
Illinois Pollution Control Board
60 East Van Buren Street, Suite 630
Chicago, Illinois 60605

(VIA ELECTRONIC MAIL)

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board, the **ENTRY OF APPEARANCE** and **PRE-FILED TESTIMONY OF JOHN DEREK REESE ON BEHALF OF THE AMERICAN PETROLEUM INSTITUTE** for American Petroleum Institute, copies of which are hereby served upon you.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

By:/s/ Alec Messina_____

Dated: February 6, 2023

Alec Messina
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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ENTRY OF APPEARANCE OF ALEC MESSINA

NOW COMES Alec Messina, of the law firm HEPLERBROOM, LLC, and hereby enters his appearance in this matter on behalf of the AMERICAN PETROLEUM INSTITUTE.

Respectfully Submitted,

By: /s/ *Alec Messina*

DATE: February 6, 2023

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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
AMENDMENTS TO 35 ILL. ADM. CODE	)	R 23-18
PARTS 201, 202, and 212	)	(Rulemaking – Air)

PRE-FILED TESTIMONY OF JOHN DEREK REESE ON BEHALF OF THE AMERICAN PETROLEUM INSTITUTE

NOW COMES, the AMERICAN PETROLEUM INSTITUTE (API), by and through its attorneys, HeplerBroom, LLC, and pursuant to 35 Ill. Adm. Code § 102.306 and the Illinois Pollution Control Board's ("Board") Notice of Hearing dated December 16, 2022, hereby submits the following PRE-FILED TESTIMONY OF JOHN DEREK REESE for presentation at the February 16, 2023, hearing scheduled in the above-referenced matter.

I. Introduction

Good afternoon. My name is John Derek Reese, and I am the Downstream Policy Advisor within Policy, Economics, and Regulatory Affairs at API. I have more than thirty years of industry experience working in refining and petrochemical manufacturing operations as well as safety, health, and environmental compliance. My current responsibilities include advocating for API member companies' perspective on environmental and process safety issues that may impact the procedures and/or operations of the refineries in the United States. My *curriculum vitae* is attached as Attachment A.

API respectfully opposes the Illinois Environmental Protection Agency's (IEPA or Agency) proposed amendments to Part 201on the grounds that eliminating any provision for periods of startup, malfunction, and/or breakdown (SMB) in Illinois' air regulations will unfairly and unlawfully render numerous state emissions limitations and standards infeasible or impossible to meet. API requests that the Board instead replace the generally applicable SMB regulations that

would be eliminated by this rule with rule-specific SMB provisions. Such an approach would fully satisfy state and federal regulatory obligations, ensure that affected rules will be adequately protective of air quality, and allow for continuous compliance.

The purpose of my testimony today is to provide a concise but detailed background on the API's concerns with adverse impacts which will result from the proposed deletion in Board Rulemaking R2023-018 of all SMB provisions or requirements in 35 Illinois Administrative Code (IAC) Part 201. My testimony will be comprised of two parts.

First, I will review the United States Environmental Protection Agency's (USEPA) startup, shutdown, and malfunction (SSM) State Implementation Plan (SIP) call requirements and offer a simple and straightforward approach to address adverse impact on refinery production as well as satisfactorily meet all of USEPA's SIP call requirements. The Board need only to reference the appropriate 40 Code of Federal Regulations (CFR) Part 60 and Part 63 SSM emission standards and work practices as acceptable alternatives for the State carbon monoxide (CO) emission limitation requirement.

Second, I will demonstrate the very real and adverse impacts on refinery operations for fluid catalytic cracking units (FCCUs) that IEPA's proposed removal of SMB provisions in Part 201 will create. Further, I will review how USEPA recognized the unique and important operating conditions that FCCUs must follow during startup, shutdown, and maintenance period preparation to ensure safe operations as well emissions minimization. Industry and USEPA worked diligently together to develop effective and appropriate SSM emission standards and alternative work practices as part of the Refinery Sector Rulemaking[1] (40 CFR Part 63 Subpart UUU "National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking

[1] 80 FR 75178, December 1, 2015.

Units, Catalytic Reforming Units, and Sulfur Recovery Units"). These SSM work practices and standards have been successfully utilized by refineries in the U.S. since 2019. IEPA's proposed action will prohibit the use of these effective and useful standards for SMB periods for FCCUs and could cause direct economic harm to Illinois refineries by potentially resulting in periods of unnecessary curtailment of gasoline, diesel, aviation fuel, and other key feedstocks production in the Illinois and greater mid-west markets.

As background, API is the only national trade association representing all facets of the oil and natural gas industry, which supports more than 11 million U.S. jobs and nearly 8 percent of the U.S. economy. API's approximately 600 members include large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine businesses, and service and supply firms. API members operate facilities subject to each of the proposed changes to SMB regulatory language addressed in this proposal, including refineries subject to Part 63 Subpart UUU, and will be directly impacted by the proposed amendments.

There are four refineries located in Illinois which will be impacted by the proposed amendments to Part 201. These include:

1) ExxonMobil Joliet Refinery (ID No. 197800AAA) located in Channahon Township. This refinery has a capacity of >250,000 barrels per day and operates a single fluid catalytic cracker.
2) WRB Refining Wood River Refinery (ID No. 119090AAA) located in Roxana, Illinois. This refinery has a capacity of >350,000 barrels per day and operates two fluid catalytic crackers.
3) PDV Midwest Lemont Refinery (ID No. 197090AAI) located in Lemont, Illinois. This refinery has a capacity of >179,000 barrels per day and operates a single fluid catalytic cracker.
4) Marathon Robinson Refinery (ID No. 033808AAB) located Robinson, Illinois. This refinery has a capacity of >250,000 barrels per day and operates a single fluid catalytic cracker.

II. SSM SIP Call and Guidance for Alternative Emission Limitations (AELs)

IEPA proposes to "amend the Illinois Administrative Code to remove provisions that allow sources to request, and the Illinois EPA to grant, advance permission to continue operating during a malfunction, or to violate emission limitations during startup." IEPA, Statement of Reasons at 1, PCB R 23-18. According to IEPA, "[r]emoving these provisions is necessary for the Illinois EPA to comply with the United States Environmental Protection Agency's (USEPA) State Implementation Plans: Response to Petition for Rulemaking; Restatement and Update of EPA's SSM Policy Applicable to SIPs; Findings of Substantial Inadequacy; and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown and Malfunction ("SSM SIP Call"), 80 Fed. Reg. 33840 (June 12, 2015) and Finding of Failure to Submit State Implementation Plan Revisions to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown and Malfunction ("Finding of Failure to Submit SIP Revisions"), 87 Fed. Reg. 1680 (Jan. 12, 2022)." *Id*.

IEPA proposes to repeal in their entirety 35 Ill. Adm. Code Part 201 Subpart I Sections 201.261 through 201.265 and 201.149 – the provisions that effectively established permit-based exemptions for periods of SMB. IEPA does not propose to replace these provisions with any other provision for operation during periods of SMB. IEPA argues that the proposed rule is "both technically feasible and economically reasonable because the amendments do not impose any new or additional obligations such as emission limits or control requirements on affected sources." Statement of Reasons at 15. IEPA asserts that "Illinois' SSM provisions never excused sources from the obligation to comply with emission standards during startup or malfunction events" and that "[t]he determination that those emission standards are technically feasible and economically

reasonable would have been appropriately addressed by the Board in the rulemaking that established those specific standards and should not be revisited here." *Id*.

Notably, IEPA argued during the course of USEPA's SSM SIP Call rulemaking that its SMB rules did not establish an exemption for periods of SMB, but instead established an affirmative defense for affected facilities. *See* 78 Fed. Reg. 12460, 12514 (Feb. 22, 2013). But USEPA viewed Illinois' rules as "ambiguous" such that they "could be read as allowing the state official to be the unilateral arbiter of whether the excess emissions in a given malfunction, breakdown, or startup event constitute a violation." *Id*. at 12515. USEPA did not move away from that view in the supplemental proposal, where the USEPA simply elaborated on an alternative argument related to affirmative defenses "[t]o the extent" that the Illinois SMB provisions might be construed as such. 70 Fed. Reg. 55920, 55941 (Sept. 17, 2014).

III. Rule-Specific SMB Standards are Needed and Would Be Fully Consistent With USEPA's SSM Policy

API urges the Board to establish appropriately tailored rule-specific provisions for operation during periods of SMB. Failure to do so will unavoidably cast numerous affected sources into an impossible compliance situation because proper implementation of numerous Illinois source-specific air emissions standards depends on the existence of alternative standards for SMB periods.

As an initial matter, we note that the Illinois Environmental Regulatory Group (IERG) filed comments in this proceeding on December 30, 2022, that provided relevant background on the current SMB provisions that IEPA proposes to eliminate. Comments of the Illinois Environmental Regulatory Group, In the Matter of Amendments to 35 Ill. Adm. Code Parts 201, 202, and 212 (Dec. 30, 2022). Exhibit 1 to those comments is a copy of IERG's preliminary comments on this action, which were submitted to IEPA on December 6, 2022.

In that exhibit, IERG shows that when Sections 201.261, 201.262, and 201.265 were enacted by the Illinois Pollution Control Board in April 1972 (and subsequently approved by USEPA as part of the Illinois SIP, at 37 Fed. Reg. 10862 (May 31, 1972)), the purpose of these provisions was to provide a mechanism for IEPA to "place[] case-by-case discretion in the Agency under its permit powers, providing that if special conditions warrant permission to operate during a malfunction, or if irreducible startup emissions will somewhat exceed the general standards, [Illinois] EPA may grant permission for such emissions upon application and proof." Exhibit 1 at 2 (citing Opinion and Order of the Board, R71-23 at 9).

Contrary to IEPA's current view, the SMB regulations at issue in this proceeding did not merely establish an affirmative defense against possible violations during periods of SMB. Rather, the SMB provisions allowed for IEPA to grant "permission to operate" during periods of SMB by way of case-by-case decisions through permitting. This is effectively how the SMB provisions have been administered since their inception.

So it is incorrect for IEPA to assert in this proceeding that "[t]he determination that [the state's existing] emission standards are technically feasible and economically reasonable would have been appropriately addressed by the Board in the rulemaking that established those specific standards and should not be revisited here." Statement of Reasons at 15. The facts show that the Board has understood from the beginning that the generally applicable SMB provisions at issue in this proceeding obviated the need to craft rule-specific SMB provisions. Thus, eliminating the current generally-applicable SMB provisions creates a gap in the state's source-specific rules that must be filled. If that is not done, existing standards will likely arbitrarily and unlawfully impose highly impracticable (if not impossible) and inordinately costly emissions control standards on affected sources.

As an example specific to our industry, 35 Ill. Admin. Code 216.361 imposes CO emissions standards on specified petroleum and petrochemical processes, including FCCUs. Section 216.361 provides no provision or alternative standards for periods of SMB, notwithstanding that fact that it is generally understood that CO emissions from FCCUs can vary widely during startup due to the complex procedures needed to eventually bring a unit and its air pollution controls to a steady-state operating condition. *See, e.g.*, 80 Fed. Reg. 75178, 75211 (Dec. 1, 2015) (where USEPA in its 2015 update of the NESHAP applicable to FCCUs established alternative standards for startup and shutdown periods for the CO standard used as a surrogate for control of organic hazardous air pollutants). Indeed, IEPA has long been aware that facilities with FCCUs require provisions for operations during periods of SMB under this standard and has routinely provided case-by-case allowances in site-specific permits.

Establishing rule-specific SMB provisions in Section 216.361 would easily satisfy USEPA's guidance that sets the parameters for approvable alternative standards for non-routine operations. USEPA makes it abundantly clear that states "can develop special, alternative emission limitations that apply during startup or shutdown if the source cannot meet the otherwise applicable emission limitation in the SIP." 80 Fed. Reg. at 33980. USEPA further explains that "SIP provisions may include alternative emission limitations for startup and shutdown as part of a continuously applicable emission limitation when properly developed and otherwise consistent with CAA requirements." *Id*. Similarly, "[i]n cases in which measurement of emissions during startup and/or shutdown is not reasonably feasible, it may be appropriate for an emission limitation to include as a component a control for startup and/or shutdown periods other than a numerically expressed emission limitation." *Id*.

USEPA recommends that seven criteria should be considered in setting such alternative standards:

> (1) The revision is limited to specific, narrowly defined source categories using specific control strategies (e.g., cogeneration facilities burning natural gas and using selective catalytic reduction);
>
> (2) Use of the control strategy for this source category is technically infeasible during startup or shutdown periods;
>
> (3) The alternative emission limitation requires that the frequency and duration of operation in startup or shutdown mode are minimized to the greatest extent practicable;
>
> (4) As part of its justification of the SIP revision, the state analyzes the potential worst-case emissions that could occur during startup and shutdown based on the applicable alternative emission limitation;
>
> (5) The alternative emission limitation requires that all possible steps are taken to minimize the impact of emissions during startup and shutdown on ambient air quality;
>
> (6) The alternative emission limitation requires that, at all times, the facility is operated in a manner consistent with good practice for minimizing emissions and the source uses best efforts regarding planning, design, and operating procedures; and
>
> (7) The alternative emission limitation requires that the owner or operator's actions during startup and shutdown periods are documented by properly signed, contemporaneous operating logs or other relevant evidence.

Id.

USEPA also advises that alternative standards should be "clearly stated and obviously [should be] an emission limitation that applies to the source," should meet "the applicable stringency level for this type of emission limitation," and "contain[] requirements to make it legally and practically enforceable." *Id*. at 33979.

Lastly, USEPA explains that states must be sure to comply with requirements for SIP revisions specified at Clean Air Act (CAA) §§ 110(l) and 193. Id. at 33975. According to USEPA, [u]nder section 110(l), the USEPA is prohibited from approving any SIP revision that would

interfere with any applicable requirement concerning attainment and reasonable further progress or any other requirements of the CAA." *Id*. "Section 193 prohibits states from modifying regulations in place prior to November 15, 1990, unless the modification ensures equivalent or greater reductions of the pollutant." *Id*. at 33982. This CAA § 193 prohibition applies only to air pollutants for which the area was in nonattainment as of the date of enactment of the 1990 Clean Air Act Amendments. CAA § 193.

USEPA provides specific guidance for making determinations of compliance for CAA §§ 110(l) and 193. As relevant here, when "[a] state elects to revise its SIP provision by replacing an automatic exemption for excess emissions during startup and shutdown events with an appropriate alternative emission limitation (e.g., a different numerical limitation or different other control requirement) that is explicitly applicable during startup and shutdown as a component of the revised emission limitation … the Agency believes in general that this type of SIP revision should not entail a complicated analysis to meet" CAA §§ 110(l) and 193. Id. at 33975. "Presumably, the replacement of an automatic exemption applicable to startup and shutdown with an appropriate alternative emission limitation would not constitute backsliding, would strengthen the SIP and would be consistent with the overarching requirement that the SIP revision be consistent with the requirements of the CAA." *Id*. at 33975-6.

The State CO emissions standard applicable to FCCUs, 35 Ill. Admin. Code 216.361, can be used to illustrate how EPA's guidance can easily be put into practice in Illinois. To begin, Section 216.361 applies specifically to "petroleum and petrochemical processes," so it is a source-specific emissions standard and not the type of generally applicable standard that EPA disfavors. Section 216.361 imposes numeric CO emissions limitations that have been demonstrated not to be achievable by affected sources (as indicated by the permit-specific SMB provisions issued by

IEPA over the years). And USEPA demonstrated in the 2015 petroleum NESHAP rulemaking that alternative numeric CO standards covering at least periods of startup are needed and appropriate for FCCUs and related equipment.

We note that, in its SSM guidance, EPA expressly states that "[t]he federal NESHAP and NSPS regulations and the technical materials in the public record for those rules may provide assistance for states as they develop and consider emission limitations and alternative emission limitations for sources in their states, and definitions of startup and shutdown events and work practices for them found in these regulations may be appropriate for adoption by the state in certain circumstances." 80 Fed. Reg. at 33980. USEPA explains that "the NSPS regulations should provide very relevant information for sources of the same type, size and control equipment type, even if the sources were not constructed or modified within a date range that would make them subject to the NSPS." Id. "The EPA therefore encourages states to explore these approaches." *Id*.

So with regard to establishing appropriate SMB provisions under Section 216.361, IEPA can utilize the work that USEPA did in the petroleum refinery NESHAP, which will deliver significant cost and time savings during this rulemaking. Perhaps more importantly, utilizing USEPA's standards also will provide a high degree of assurance that USEPA will approve the alternative standards, especially because USEPA in its 2015 review of the petroleum refinery NESHAP carefully examined the rule-specific SSM provisions and adjusted them as necessary to comport with current law and policy governing SSM provisions. 80 Fed. Reg. at 75182 ("This action finalizes changes to the SSM provisions to ensure that the subparts are consistent with the court decision in Sierra Club v. EPA, 551 F. 3d 1019 (D.C. Cir. 2008).").

As to the SIP revision limitations imposed by CAA § 193, we note that we are not aware that any area within the State of Illinois was nonattainment for CO as of enactment of the 1990

Clean Air Act Amendments. Thus, CAA § 193 would not apply to changes made in this rulemaking to Section 216.361.

As for CAA § 110(l), USEPA should be expected to presume that replacing the current generally applicable SMB provisions with rule-specific SMB provisions will be acceptable. As noted above, USEPA's policy is that "the replacement of an automatic exemption applicable to startup and shutdown with an appropriate alternative emission limitation would not constitute backsliding, would strengthen the SIP and would be consistent with the overarching requirement that the SIP revision be consistent with the requirements of the CAA." 80 Fed. Reg. at 33975-6.

We understand that IEPA believes that this guidance may not be applicable here because the state has taken the position that the current SMB provisions establish an affirmative defense and do not constitute an automatic exemption from otherwise applicable rules such as Section 216.361. We respectfully disagree with this view.

First, even though Section 201.265 states that permission to operate during SMB conditions "shall be a prima facie defense to an enforcement action alleging" violations of emissions standards, as we explained above, this provision in practice for decades has operated as an exemption (as intended by the Board when enacted in 1972). Indeed, USEPA's SSM SIP call to Illinois is primarily based on USEPA's belief that the current SMB provisions allow "the state official to be the unilateral arbiter of whether the excess emissions in a given malfunction, breakdown, or startup event constitute a violation." 78 Fed. Reg. at 12515. The current SMB provisions should be construed as implemented in practice and not as they might be interpreted in isolation. Thus, USEPA guidance related to replacing generally applicable SSM exemptions with rule-specific provisions is squarely applicable.

Second, the primary purpose of CAA § 110(l) is to make sure that SIP revisions do not result in adverse impacts on air quality, up to and including violations of National Ambient Air Quality Standards (NAAQS). Rule-specific SMB provisions should by definition be more protective of air quality than generally applicable exemptions because such rule-specific provisions target particular source types and would comprise tailored alternative standards that are more constraining than the current generally applicable SMB provision. Notably, there is no evidence that the current SMB provisions have resulted in NAAQS violations or significant deterioration related to CO emissions governed by Section 216.361. Rule-specific SMB provisions would provide an added layer of assurance that such outcomes should not occur due to operations during periods of SMB.

In sum, eliminating the current generally applicable SMB provisions without providing rule-specific replacements will unlawfully and arbitrarily cause emissions standards designed to apply during normal operations to apply during SMB periods, when compliance with such standards often will be highly impracticable or impossible. As shown by the above analysis for Section 216.361, the CO standards for petroleum refinery operations, viable source- and rule-specific alternative standards are available through relevant federal standards (such as NSPS and NESHAP) or could easily be devised by IEPA. And such standards easily meet USEPA's current policy defining acceptable SSM provisions. We urge the Board to devise such rule-specific alternative standards in Section 216.361 and in other relevant SIP-based emission standards. Specifically, we urge the Board to adopt IERG's proposed amendment to Section 216.361 as set forth in IERG's pre-filed testimony filed on February 6, 2023.

IV. Petroleum Refinery FCCU Technical Description and Monitoring System

As stated earlier there are four (4) petroleum refineries in the state of Illinois representing a daily capacity of nearly a million barrels per day of crude oil refining capacity. These refineries represent a total of five FCCUs. These units are often referred to as "Cat Crackers".

Fluid Catalytic Cracking is a refining process used to convert heavier and higher boiling point hydrocarbons from crude oil into gasoline, diesel, jet fuel, heating oil, and other useful products. These types of units are arguably the most important and widely used conversion process in the refinery due to its ability to process large volumes of heavy feedstocks into desirable, high-value transportation fuels and other feedstocks and chemical products.

A simple and succinct description of the FCCU process is helpful in explaining what is happening inside a "cat cracker." This is how a cat cracker works:

> FCCUs upgrade heavier hydrocarbons from crude oil into lighter products, primarily gasoline, diesel, jet fuel, and other fuel products, by a catalytic cracking reaction. The technology utilized by FCCUs involves circulating catalyst between two vessels – the stripper/reactor and the regenerator using transfer lines. The heavier hydrocarbons are fed into the reactor where it mixes with the catalyst. The reaction happens as the hydrocarbon and catalyst travel upward through reactor riser which is essentially a large vertical pipe. At the top the newly formed or "cracked" hydrocarbon vapors are separated from the catalyst and any heavier unreacted hydrocarbon through a series of baffles and cyclones. The hydrocarbon vapors are sent to the main distillation column or fractionator to be separated into the useful product streams. The separated catalyst and heavier hydrocarbon flow back to the regenerator.
>
> During the cracking reaction, a layer of carbon or "coke" is formed on the catalyst. This coke is burned off the surface of the catalyst in the regenerator to clean the catalyst for reuse and provide the necessary heat to operate the unit. The regenerated catalyst is then sent back to the reactor to repeat the cracking cycle. When the coke burns off it creates flue gas which contains CO. The flue gas flows out the regenerator and enters a system

comprised of multiple pieces of equipment which remove any remaining catalyst particles present. The regenerator and flue gas system comprise the air side of the FCCU.

The air side of the FCCU is where the flue gas is treated to remove sulfur compounds (e.g, SO_2), any entrained catalyst particles (e.g, cyclones, electrostatic precipitators), and combustion of carbon monoxide to CO2. Interestingly, the combustion of CO to CO_2 generally takes place in large CO boilers which has the added benefit of being a refinery's largest steam generator to support refinery-wide process unit steam-supply needs. FCCUs are also characterized as being either full burn or partial burn units. Partial burn units complete the combustion of the flue gas (including CO) downstream in a CO boiler. Because of these high levels of CO when the CO boiler is not available (versus the 500 ppm normal operation limit), averaging is not an effective way of addressing startup and shutdown emissions for partial burn CO emission limits. A full burn unit (referred to in Section 216.361(b) as "catalyst regenerators for fluidized catalytic converters equipped for in situ combustion of carbon monoxide") operates with excess oxygen to ensure complete combustion and has CO levels of about 10-100 ppm out of the regenerator during normal operation. Full burn units are generally not equipped with CO boilers.

It is important to note that these FCCUs currently operate with extensive continuous emissions monitoring systems (CEMS) for SO_2, CO and NO_x. These analyzers are typically rigorously maintained and routinely tested to validate their accuracy per EPA standards and regulations. Their performance is reported to the EPA and IEPA semi-annually, including periods of excess emissions due to startup, shutdown, and malfunctions. Further, every FCCU includes sophisticated operating control systems and parameter monitoring to help ensure safe operations and minimization of emissions.

V. Federal and State CO Standards

FCCUs operating in Illinois have stringent state and federal emission standards for CO. The State CO standard is 200 ppm on a one-hour average basis per Section 216.361. This standard

has been in place since 1972. This standard was established to ensure that the State meets new national ambient air standards set in the CAA Amendments of 1970.

Illinois is unique in its approach by prescribing a specific CO emission limitation of 200 ppm when compared to other states. Most states simply require use of combustion of CO for catalytic cracker during normal operations without the addition of a numeric concentration limit. South Coast Air Quality District has a 500 ppm limitation but allows a specific startup duration (hours allowed) and limits the annual number of startups from FCCUs. Similar to SCAQD, Bay Area Air Quality Management District has a 350 ppm standard with a startup exemption. Generally, states have consistently incorporated by reference both Part 60 NSPS and Part 63 NESHAP standards. In some cases, they have state standards that are exempted when a unit is subject to a federal NSPS and/or NESHAP (e.g., Indiana). Illinois' limitation of 200 ppm is a unique problem with respect to FCCU startup and shutdown events when compared to other states.

The federal standard is 500 ppm on a one-hour average basis. 40 CFR Part 63.1565 and 40 CFR 60.103. This standard was included as part of the most recent Risk and Technology Review (often referred to as "RTR") completed in 2016 for both the Part 60 and 63 standards for petroleum refineries. The CO limitation serves as the surrogate parameter ensuring complete combustion conditions are being maintained which ensures optimum hazardous air pollutant (HAP) destruction efficiency/reduction from FCCUs.

VI. USEPA Recognition of Unique SSM Operating Conditions for FCCUs

As discussed previously, the court decision in *Sierra Club v. EPA*, 551 F. 3d 1019 (D.C. Cir. 2008) required USEPA to address SSM exemption and affirmative defense provisions. *See* 80 Fed. Reg. 75178 (Dec. 1, 2015). USEPA has been diligently addressing these requirements in every RTR they are conducting for industry sectors by taking a careful and detailed look at where

alternative standards or work practices would be warranted or necessitated. The petroleum refinery sector was no exception to this approach by USEPA to scrutinize existing SSM language and evaluation of the need for unique SSM scenarios.

After extensive reviews and information sharing with industry on FCCU operations, USEPA concluded that it "identified three emission sources for which specific startup and shutdown provisions may be needed." *Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards*, 80 Fed. Reg. 36880, 36943 (June 30, 2014).[2] These three scenarios included startup for FCCUs equipped with electrostatic precipitators, startup for FCCUs using CO Boilers, and Sulfur Recovery Units (SRUs). In both FCCU scenarios, the agency recognized that the startup sequence for FCCUs is a delicate sequence of events/steps as the reactor and regenerator are brought online and raised to appropriate operating temperatures prior to the introduction of hydrocarbon into the reactor.

The most relevant SSM scenario to today's proposed rulemaking concerns CO emission standards in 35 IAC Part 216. It is helpful to review exactly what happens during a startup of a FCCU to understand the implications of IEPA's proposal.

During startup of an FCCU, the reactor and regenerator train temperature train must be raised 1000-1200 degrees F which is the temperature range of the heat of reaction occurs for catalytic cracking. Prior to introducing feed into an FCCU, hot air is used initially to heat up the regenerator. The hot air is typically supplied from a natural gas-fired air-preheater that is only used for startup. If refractory repairs were made, a refractory dry-out is required and the regenerator temperature must be raised slowly (e.g., at a rate of 50 – 100F/hr) to prevent water from damaging the refractory. Emissions from the regenerator vent during this time are from the air heater.

[2] This Federal Register is publicly available at https://www.govinfo.gov/content/pkg/FR-2014-06-30/pdf/2014-12167.pdf.

These auxiliary burners and regenerator internals are not designed to heat the regenerator to temperatures required to start the FCCU cracking reactions (>1000F). Torch oil is needed to heat the regenerator beyond the capacity of the auxiliary burner and the metallurgical constraints of the regenerator system. Thus, during a typical startup, and during some shutdowns and standby operations of an FCCU, there is a period when torch oil is added to the regenerator to facilitate the unit heat-up to operating temperature. Upon the addition of feed to the unit, catalytic coke will start to burn in the regenerator along with the torch oil. Feed ramp up is fairly quick, during which time the torch oil is backed out during normal startups but can be longer if refractory repairs were made because of the need to raise temperatures slowly so as not to damage the new refractory. The period of torch oil addition (i.e., the period when the bed temperature is relatively low) results in increased CO during the start-up period.

For full burn FCCUs, there is a relatively short period of time during startup when the unit operates in partial burn mode resulting in an additional period of higher CO. This partial burn period can result from heat imbalances during this transition state or may be required for safety because operation at regenerator temperatures high enough for complete combustion while establishing catalyst circulation or introducing feed can result in exceeding metallurgical temperature limits. The unit is inherently unstable as feed is being put into the unit. It is a balancing act that requires operators to manually balance heat consumed to vaporize the feed and sustain the cracking reaction as additional feed is being put on the unit with the heat being brought into the reactor from the regenerator via catalyst circulation, which is a function of regenerator operating conditions. This is an extremely complex operation with numerous variables that operations must manage until the unit can be lined out.

For a partial burn unit, the required CO boilers add an additional step to unit start-up. Additional time is required from the point that the regenerator enters partial burn until the time the flue gas is all routed through the CO boiler(s). The CO boiler(s) must be brought up separately from the regenerator to protect them from swings of the regenerator flue gas quality during the startup process, which can result in temperature excursions, damage to CO boiler internals and/or trip of the CO boiler(s). Further, industry safety practices recognize the potential hazard for hydrocarbon vapor to flow back to a CO boiler during startup and recommend CO boiler startup after the FCCU reactor is fully operational with catalytic reactions occurring and at full operating temperature. A CO boiler trip must be avoided because it could ultimately lead to a refinery shutdown due to a drastic decrease in steam production (as noted earlier, a very large proportion of the refinery's steam supply is typically provided by the CO Boilers), resulting in excess emissions at other units, significant flaring, production loss, and potentially equipment damage. Since the regenerator flue gas initially bypasses the CO boiler, the CO is not further combusted. Once the regenerator is stable, the flue gas is added to the CO boilers and CO emissions drop to normal levels. Prior to lining up the regenerator flue gas to the CO boiler, the unit is operating in a mode with higher CO emissions for a short period of time.

USEPA recognized and agreed with industry that these startup scenarios and sequence of events were accurate and appropriately designed. Further, the agency stated that this sequence of events, specifically the use of torch oil, meant that CO concentrations would exceed the 500-ppm limit. USEPA's exact language from the preamble reads as follows:

> As mentioned previously, ''torch oil'' is injected directly into the regenerator and burned during FCCU startup to raise the temperature of the regenerator and catalyst to levels needed for normal operation. During this period, CO concentrations often will exceed the 500 ppm emissions limit due to the poor mixing of fuel and air in the regenerator. The emissions limit is based on CO emissions, as a surrogate for organic HAP emissions, and the emission limit is evaluated using a 1-hour averaging period.

> This 1-hour averaging period does not provide adequate time for short-term excursions that occur during startup to be offset by lower emissions during normal operational periods.

80 Fed. Reg. 36880, 36943 (June 30, 2014)

However, USEPA recognized that low level of CO in exhaust gas could be consistently achieved if the oxygen concentrations in the exhaust gas exceeded 1-percent by volume. This level of oxygen ensures there would be an excess level of oxygen concentration to maximize combustion and minimize CO and HAP emissions. USEPA stated that:

> Emissions of CO during startup result from a series of reactions with the fuel source and are dependent on mixing, local oxygen concentrations, and temperature. While the refinery owner or operator has direct control over air blast rates, CO emissions may not always directly correlate with the air blast rate. Exhaust oxygen concentrations are expected to be more directly linked with air blast rates and are, therefore, more directly under control of the refinery owner or operator. We are proposing an excess oxygen concentration of 1 volume percent (dry basis) based on a 1-hour average during startup. We consider the 1-hour averaging period for the oxygen concentration in the exhaust gas from the FCCU to be appropriate during periods of FCCU startup because air blast rates can be directly controlled to ensure adequate oxygen supply on a short-term basis.

80 Fed. Reg. 36880, 36943 (June 30, 2014)

VII. Implications of Unviable Proposal by Agency

What does it mean if IEPA does not incorporate the use of the federal SSM alternatives as part of this rulemaking? It means that no Illinois refinery FCCUs can start up in compliance with the 200 ppm CO standard in Section 216.361. Further, it means that an FCCU may be unable to operate in "hot standby" in response to a weather event, temporary power interruption, unplanned mechanical outages, or other refinery unit disruptions. "Hot standby" refers to the use of torch oil to maintain the reactor and regenerator temperature as well as catalyst recirculation. This operating condition is utilized for limited durations during unplanned events which require removal of feed from FCCU. Torch oil injection is also used to heat up the reactor and regenerator during start-up sequence.

Companies typically have a policy of not allowing operation in noncompliance with applicable regulations. If a refinery needs to start up after a mechanical outage, it will not be allowed to do so because, as reviewed earlier in my testimony, it is known that during certain phases of startup and use of torch oil, the FCCU will not be able to meet the 200 ppm CO standard. Similarly, if a refinery has a short-term need to operate in "hot standby" it will not be able to do so in compliance with the 200 ppm CO standard and must execute a complete FCCU shutdown. This also means it is back to square one on restart constraint.

Inaction by IEPA to address the CO concern in this rulemaking could create additional days of FCCU outages while the refinery has to make a decision to operate in noncompliance with the hope for a positive enforcement discretion decision by IEPA post-startup or shutdown. Every day of non-production could negatively impact the supply of fuel products to the mid-west and greater Chicagoland markets.

Further, any refinery seeking relief for the IEPA CO standard would be simply stating their intent to follow the existing federal SSM alternatives provided under EPA regulations. There is no other approach a refinery could take other than the federal alternatives which would also be consistent with industry recommended practices for FCCU startup and shutdown safety.

VIII. Conclusion

API members strive to meet state and federal air standards through the significant resources deployed to meet the new refinery standards for FCCUs established in 2015 which include alternative emission standards for FCCU SSM periods. API strongly recommends that the Board adopt the amendment to Section 216.361 proposed by IERG as set forth in IERG's Pre-Filed Testimony. The solution is simple, successfully implemented since 2016, and specifically reviewed and approved by USEPA as correct for FCCU SSM scenarios.

Thank you for the opportunity to testify. I will be happy to answer any questions.

Respectfully Submitted,

DATE: February 6, 2023

By: /s/ *Alec Messina*

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Summary

Utilize 30-years of experience to provide effective and efficient compliance strategies and solutions for refining and chemical operations.

Skills

- Refinery and Chemical Operations
- RMP and PSM Audit Coordination
- Ambient Air Monitoring/Fenceline & Community
- Leak Detection and Repair (LDAR) Program Execution
- Optical Gas Imaging Camera Technology
- Regulatory Analysis and Advocacy
- Data Analysis
- Source Testing and Laboratory Analysis
- Compliance Reporting
- Compliance Software Management

Experience

American Petroleum Institute
Washington, DC
Policy Advisor
11/2022 - present

- Advocacy and member support for environmental and process safety issues for API member companies with focus in downstream and refinery operations.
- Staff Lead for Air Toxics, Stationary Source Emission Estimating, Air Modeling, and Mechanical Integrity workgroups.

Exxon Mobil | Spring, Texas
Principal for Regulatory Compliance
09/2013 - 06/2022

- Excelled at recognizing new regulatory and technology developments which will have impact on manufacturing or offer unique cost savings or improved compliance effectiveness. Key examples include use of active & passive air monitoring systems, optical gas imaging camera implementation, and implementation of new flare control systems.
- Established positive working relationships with state and federal regulatory agencies. Air Toxic Group Chair for API and Member Environmental Operating Committee for AFPM
- Developed and implemented strategies necessary for minimizing risk of non-compliance for EPA Risk Management Plan (RMP) and Accident Prevention and OSHA Process Safety Management (PSM) program requirements.
- Coordinated and led all PSM/RMP compliance audits for US facilities.
- ExxonMobil's subject matter expert for LDAR and ambient air monitoring technology and program execution.

ExxonMobil | Baton Rouge, LA
Environmental Senior Section Supervisor
01/2006 - 09/2013

- Responsible for execution of air quality compliance activities, reporting, and recordkeeping for the Baton Rouge Chemical Plant, Baton Rouge Refinery, Baton Rouge Resins Finishing Plant, Anchorage Terminal, and Chalmette Refinery.
- Supervised 24 employees and 30 contractors for Baton Rouge Chemical Plant.

ATTACHMENT A

- Coordinated environmental incident response activities and served as agency/government liaison for sites.

ExxonMobil| Baton Rouge, LA
Process Operations Senior Section Supervisor
01/2003 - 01/2006

- Managed the process manufacturing units for Aromatics, Partial Oxidation, Phthalic Anhydride, and Light Ends at the Baton Rouge Refinery.
- Established production standards and productivity goals for section, prioritizing tasks to reach deadlines.
- Planned and successfully executed 3 separate unit shutdowns for maintenance and new equipment integration.

ExxonMobil | Baton Rouge, LA
Process Operations Section Supervisor
01/2000 - 01/2003

- Managed the process manufacturing units for Isopropanol, Methyl Ethyl Ketone, and Neo Acids at the Baton Rouge Chemical Plant. Isopropanol unit is the world's largest of its kind.
- Managed employees for maximum productivity, efficiency, and job safety.
- Planned and successfully executed 4 separate unit shutdowns for maintenance and new equipment integration.

ExxonMobil| Baton Rouge, LA
Technical Section Supervisor
01/1998 - 01/2000

- Managed 5 engineers and 2 technicians to provide daily operational support to plant wastewater treatment, flares, and utilities facilities for the Baton Rouge Chemical Plant.
- Coordinated all quality control programs, risk assessments, project design and execution, and compliance monitoring activities.

ExxonMobil| Baton Rouge, LA
Environmental Planning Section Supervisor
01/1995 - 01/1998

- Responsible for execution of all environmental regulatory compliance activities, reporting, and recordkeeping across all air, waste, and water programs.
- Supervised 19 employees and 30 contractors for Baton Rouge Chemical Plant.

ExxonMobil| Baton Rouge, LA
Long Range Air Planner
12/1992 - 01/1995

- Led and coordinated all air quality compliance programs including permitting, regulatory advocacy, compliance program execution (e.g., leak detection, source testing, emissions reporting).

United States Navy, USN | Norfolk, VA
United States Naval Officer
06/1985 - 12/1992

- Served on USS Donald B Beary (FF0-1085) with deployments to Mediterranean and Middle East.
- Served in rotations as Engineering Officer, Damage Control Officer, and Combat Systems Officer.
- Specialized in anti-submarine warfare including passive and active acoustic surveillance systems.

Education and Training

Fairleigh Dickinson University | Teaneck, NJ
MBA in Petrochemical Industry
01/1993

Millsaps College | Jackson, MS
Bachelor of Science in Chemistry with Honors
05/1985

CERTIFICATE OF SERVICE

I, the undersigned, on oath state the following: That I have served the attached **APPEARANCE and PRE-FILED TESTIMONY OF JOHN DEREK REESE ON BEHALF OF THE AMERICAN PETROLEUM INSTITUTE** mail upon:

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