BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
	)	R 23-18(A)
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

(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 **PROPOSAL FOR REGULATIONS OF GENERAL APPICABILLITY** on behalf of American Petroleum Institute, copies of which, are hereby served upon you.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

By: **/s/** Alec Messina
One of its Attorneys

Dated: August 7, 2023

Alec Messina
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Alec.Messina@helperbroom.com
(217) 528-3674

CERTIFICATE OF SERVICE

I, the undersigned, on oath state the following: That I have served the attached **PROPOSAL FOR REGULATIONS GENERAL APPICABILLITY** via electronic mail upon:

Mr. Don A. Brown
Clerk of the Board
Illinois Pollution Control Board
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601
don.brown@illinois.gov

Timothy Fox
Chloe Salk
Hearing Officers
Illinois Pollution Control Board
60 East Van Buren Street, Suite 630
Chicago, Illinois 60605
tim.fox@illinois.gov
chloe.salk@illinois.gov

Joshua R. More
Dave LKoring
Sarah L. Lode
Alex Garel-Frantzen
ArentFox Schiff, LLP
233 South Wacker Drive, Suite 6600
Chicago, IL 60606
Joshua.More@afslaw.com
dloring@schiffhardin.com;
Sarah.Lode@afslaw.com
Alex.Garel-Frantzen@afslaw.com

Dana Vetterhoffer
Audrey L. Walling
Assistant Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
dana.vetterhoffer@illinois.gov
Audrey.L.Walling@illinois.gov

Renee Snow
General Counsel
Illinois Department of Natural Resources
One Natural Resource Way
Springfield, Illinois 62702
renee.snow@illinois.gov

Kelly Thompson
Executive Director
Illinois Environmental Regulatory Group
215 E. Adams Street
Springfield, Illinois 62701
kthompson@ierg.org

Faith E. Bugel
1004 Mohawl Road
Wilmette, Illinois 60091
fbugel@gmail.com

Cantrell Jones
Environmental Law and Policy Center
35 E. Wacker Drive, Suite 1600
Chicago, Illinois 60606
CJones@elpc.org

Keith I. Harley
Greater Chicago Legal Clinic, Inc.
211 West Wacker Drive, Suite 750
Chicago, Illinois 60606
kharley@kentlaw.edu

Mark A. Bilut
McDermott, Will & Emery
227 West Monroe Street
Chicago, Illinois 60606
mbilut@mwe.com

Michael Leslie
USEPA - Region 5
Ralph H. Metcalfe Federal Building
77 West Jackson Blvd
Chicago, IL 60604
Leslie.michael@epa.gov

Molly Kordas
Ann Marie A. Hanohano,
Assistant Attorney General
Office of the Attorney General
69 West Washington Street, Suite 1800
Chicago, IL 60602
molly.kordas@ilag.gov
annmarie.hanohano@ilag.gov

Jason James
Assistant Attorney General
Office of the Attorney General
21 West Point Drive Suite 7
Belleville, IL 62226
Jason.James@ilag.gov

Melissa S. Brown
HeplerBroom, LLC
4340 Acer Grove Drive
Springfield, IL 62711
Melissa.Brown@heplerbroom.com

Andrew N. Sawula
ArentFox Schiff, LLP
One Westminster Place, Suite 200
Lake Forest, IL 50045
Andrew.Sawula@afslaw.com

That my email address is Alec.Messina@heplerbroom.com

That the number of pages in the email transmission is 85.

That the email transmission took place before 5:00 p.m. on August 7, 2023.

Date: August 7, 2023

/s/ Alec Messina
Alec Messina

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

TABLE OF CONTENTS

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

Dated: August 7, 2023

By: /s/ Alec Messina
One of Its Attorneys

Alec Messina
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Alec.Messina@heplerbroom.com
(217) 528-3674

[1] Copies of documents with an asterisk beside them have not been provided.

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

CERTIFICATE OF ORIGINATION

The American Petroleum Institute certifies in accordance with 35 Ill. Adm. Code 102.202(i) that its Proposal for Regulations of General Applicability, which proposes to amend 35 Ill. Adm. Code Part 216, amends the most recent version of the rules as published on the Illinois Pollution Control Board's website.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

Dated: August 7, 2023

By: /s/ Alec Messina
One of Its Attorneys

Alec Messina
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Alec.Messina@heplerbroom.com
(217) 528-3674

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

MOTION FOR WAIVER OF COPY REQUIREMENTS

The American Petroleum Institute ("API"), by and through its attorneys, HEPLERBROOM, LLC, hereby moves that the Illinois Pollution Control Board ("Board"), pursuant to 35 Ill. Adm. Code 101.500, 102.202, and 102.402, waive the requirement that API provide copies of documents incorporated by reference in its proposal for regulations of general applicability. In support of this motion, API states as follows:

1. The Board's procedural rules at 35 Ill. Adm. Code 102.202 require that a proposal for a regulation of general applicability include "any material to be incorporated by reference within the proposed rule pursuant to Section 5-75 of the [Illinois Administrative Procedure Act]." 35 Ill. Adm. Code 102.202(d). Section 27(a) of the Illinois Environmental Protection Act ("Act") also requires that a petitioner provide information supporting a regulatory proposal. 415 ILCS 5/27(a).

2. API's proposal incorporates by reference the following:

40 CFR Part 63, Subpart A (2022)

40 CFR Part 63, Subpart UUU (2022)

3. The documents listed above are part of the Code of Federal Regulations, are all readily accessible to or are within the possession of the Board, and are all publicly available online on the Government Publishing Office's website at https://www.ecfr.gov/cgi-bin/ECFR?page=browse.

WHEREFORE, for the above and foregoing reasons, the American Petroleum Institute hereby respectfully requests the Illinois Pollution Control Board waive the requirement to provide copies of the aforementioned documents.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

Dated: August 7, 2023

By: /s/ Alec Messina
One of Its Attorneys

Alec Messina
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Alec.Messina@heplerbroom.com
(217) 528-3674

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

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

AMERICAN PETROLEUM INSTITUTE'S
PROPOSAL FOR REGULATIONS OF GENERAL APPLICABILITY

STATEMENT OF REASONS

I. INTRODUCTION

The American Petroleum Institute ("API"), by and through its attorneys HEPLERBROOM, LLC, submits this Proposal for Regulations of General Applicability ("Proposal") to the Illinois Pollution Control Board ("Board") pursuant to Sections 27 and 28 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/27 and 28, and 35 Ill. Adm. Code 102.200 and 102.202. This Statement of Reasons is submitted in support of amending 35 Ill. Adm. Code Part 216, Carbon Monoxide Emissions, specifically amending Section 216.103 (Definitions), Section 216.104 (Incorporations by Reference), and Section 216.361 (Petroleum and Petrochemical Processes).

API is a national trade association which represents all facets of the oil and natural gas industry. API has approximately 600 members, including large integrated companies, as well as exploration and production, refining, marketing, pipeline, and marine business, and service and supply firms.

In December 2022, the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") proposed amendments to the startup, malfunction, and breakdown ("SMB") regulations in PCB R 23-18, including removing SMB provisions in 35 Ill. Adm. Code Parts 201, 202, and 212. Illinois EPA Proposal, PCB R 23-18 (Dec. 7, 2022). On July 20, 2023, the Board adopted

Illinois EPA's proposal. Opinion and Order, PCB R 23-18 (July 20, 2023). API members operate facilities that are impacted by the changes to the SMB provisions. Four refineries that are impacted by the recent amendments to Part 201 include:

- ExxonMobil Corp. Joliet Refinery (ID No. 197800AAA) (Will County)
- WRB Refining LP Wood River Refinery (ID No. 119090AAA) (Madison County)
- CITGO Petroleum Corp. Lemont Refinery (ID No. 197090AAI) (Will County)
- Marathon Petroleum Co. Robinson Refinery (ID No. 033808AAB) (Crawford County)

API submits this Proposal to amend the Board's carbon monoxide (CO) standards applicable to petroleum and petrochemical processes in Part 216 as a result of the Board's removal of the SMB provisions in Part 201. As explained in this Proposal, the Board's removal of the SMB provisions will greatly impact refinery operations that include fluid catalytic cracking units ("FCCUs") as FCCUs are unable to comply with the standards in Section 216.361 during SMB events. API proposes to amend Section 216.361 by incorporating by reference select provisions of the National Emission Standards for Hazardous Air Pollutants ("NESHAP") for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units at 40 CFR Part 63, Subpart UUU. In promulgating NESHAP Subpart UUU, the United States Environmental Protection Agency ("USEPA") recognized the unique and important operating conditions that FCCUs must follow during SMB periods to ensure safe operations and minimize emissions. The Board's removal of the SMB provisions in Part 201 will prohibit the use of these effective and useful standards for SMB periods for FCCUs. The removal of the SMB provisions could also 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 Midwest markets. API respectfully requests that the Board adopt API's Proposal.

II. STATEMENT OF FACTS

A. Background on SMB Regulations

The majority of the SMB provisions that were the subject of PCB R 23-18 were originally adopted by the Board in April 1972. *See* Opinion and Order of the Board, *In the Matter of: Emission Standards*, PCB R 71-23 (Apr. 13, 1972) (adopting Section 201.149 (then Rule 105(a)), Section 201.157 (then Rule 103(b)(3), Sections 201.261 – 201.265 (then Rules 105(b) – (f), Section 201.301 (then Rule 107(a)), and Section 212.124 (then Rule 202(c)). The SMB provisions were adopted in a large rulemaking for new regulations for emission control of sulfur dioxide, nitrogen oxides, CO, hydrocarbons, and particulate matter. Final Order and Opinion, PCB R 71-23, at 1 (April 13. 1972). The Board recognized that sources were unable to meet many of the emission limitations and standards being adopted, explaining:

> Many of the substantive limitations adopted today impose stringent new requirements which cannot be met immediately without closing down large numbers of existing facilities. While it is important that the new standards be met as soon as is practicable, we have no wish to obtain clean air at the cost of closing down society.

Id. at 8. Instead of delaying the effective date of the standards, the Board promulgated provisions providing for compliance schedules to allow time for new control equipment to be installed on existing units. 35 Ill. Adm. Code 201, Subpart H. These provisions provided for a prima facie defense to an enforcement action alleging a violation of the air standards or limitations. 35 Ill. Adm. Code 201.245. Similarly, the SMB provisions in the Board's rules provided for a prima facie defense, and the SMB permit conditions were intended to be revisited with each operating permit renewal.

As to adopting the SMB provisions in Sections 201.261-201.265 (then Rules 105(b)-(f)), the Board's explanation of the rules was as follows:

> Rule 105: Malfunctions, Breakdowns, and Startups. No machine works perfectly all the time. Further, startup conditions may result in less than optimum emission control. The policy of this Rule is that insofar as is practicable, efforts shall be made to reduce the incidence and duration of startups and excessive emissions during startup periods; and that, except in special cases, equipment whose pollution controls are out of order should not be operated, just as an automobile should not be operated when its brakes are out of commission. Clearly the latter principle cannot be absolute, for it may not be worth blacking out the entire Midwest to prevent emissions from a partly malfunctioning boiler precipitator. We cannot resolve the myriad of individual variations in a single rule. The Agency's admirable proposal, which we have adopted, places 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, EPA may grant permission for such emissions upon application and proof.

Opinion and Order of the Board, R71-23 at 9.

The SMB relief provisions were a foundational part of the development of the "general standards" (promulgated at the same time, *see* PCB R 71-23). The Board recognized fifty years ago that sources may be unable to comply with applicable emission limitations or standards during startup because "startup conditions may result in less than optimum emission control." *Id*. The Board also recognized that unavoidable malfunctions and breakdowns do occur and that, in certain circumstances, continued operation is required even though emission may be in excess of the generally applicable standard. *Id*. Prior to the Board's removal of the provisions in PCB R 23-18, the SMB provisions adopted in PCB R 71-23 remained unchanged except for minor, non-substantive revisions. Testimony of Rory Davis, Illinois EPA, Transcript of January 19, 2023 Hearing, PCB R 23-18, at 13:6-15 (Jan. 19, 2023). The reasons for originally adopting the SMB provisions still hold true today.

B. SSM SIP Call and Guidance for Alternative Emission Limitations

On June 12, 2015, USEPA published in the Federal Register a final rule clarifying, restating, and updating USEPA's national policy regarding startup, shutdown, and malfunction ("SSM") provisions in State Implementation Plans ("SIP"). *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*, 80 Fed. Reg. 33840 (June 12, 2015). A Notice of Proposed Rulemaking was first published in the Federal Register for these revisions on February 22, 2013. *See id*. at 33842. The revisions were USEPA's response to a 2011 Petition for Rulemaking filed by the Sierra Club. *Id*.

USEPA announced in the 2015 final action its SSM policy, which concluded that broad SSM exemption provisions and affirmative defense SIP provisions are generally viewed as inconsistent with the requirements of the Clean Air Act ("CAA"). *Id*. at 33851. Specifically, USEPA granted Sierra Club's Petition "on the request to rescind its SSM Policy element that interpreted the [Clean Air Act] to allow states to elect to create affirmative defense provisions in SIPs." *Id*. However, USEPA also recognized that there are approaches to address emissions during SSM events that are consistent with the requirements of the CAA. *Id*. at 33844. USEPA explained:

> The EPA emphasizes that there are other approaches that would be consistent with CAA requirements for SIP provisions that states can use to address emissions during SSM events. While automatic exemptions and director's discretion exemptions from otherwise applicable emission limitations are not consistent with the CAA, SIPs may include criteria and procedures for the use of enforcement discretion by air agency personnel. Similarly, SIPs may, rather than exempt emissions during SSM events, include emission limitations that subject those emissions to alternative numerical limitations or other technological control requirements or work practice requirements during startup and shutdown events, so long as those components of the emission limitations meet applicable CAA requirements . . . . The EPA acknowledges that for some states, this rulemaking entailed the EPA's evaluation of SIP provisions that may date back several

> decades. Aware of that fact, the EPA is committed to working closely with each of the affected states to develop approvable SIP submissions consistent with the guidance articulated in the updated SSM Policy in this final action.

Id.

USEPA also offered additional explanation as to USEPA's recommended criteria for developing alternative emission limitations ("AELs") that would be applicable during periods of SSM:

> In addition, the EPA is providing in this document some additional explanation and clarifications to its recommended criteria for developing alternative emission limitations applicable during startup and shutdown. The EPA continues to recommend that, in order to be approvable (i.e., meet CAA requirements), alternative requirements applicable to the source during startup and shutdown should be narrowly tailored and take into account considerations such as the technological limitations of the specific source category and the control technology that is feasible during startup and shutdown. Accordingly, the EPA continues to recommend the seven specific criteria enumerated in section III.A of the Attachment to the 1999 SSM Guidance as appropriate considerations for SIP provisions that establish alternative emission limitations that apply to startup and shutdown. . . .
>
> ***
>
> The EPA seeks to make clear in this document that the recommended criteria are intended as guidance to states developing SIP provisions that include emission limitations with alternative emission limitations applicable to specifically defined modes of source operation such as startup and shutdown. A state may choose to consider these criteria in developing such a SIP provision. The EPA will use these criteria when evaluating whether a particular alternative emission limitation component of an emission limitation meets CAA requirements for SIP provisions. Any SIP revision establishing an alternative emission limitation that applies during startup and shutdown would be subject to the same procedural and substantive review requirements as any other SIP submission.

Id. at 33913.[1]

[1] USEPA defined an "alternative emission limitation" as "an emission limitation in a SIP that applies to a source during some but not all periods of normal operation (e.g., applies only during a specifically defined mode of operation such as startup or shutdown). An alternative emission limitation is a component of a continuously applicable SIP emission limitation, and it may take the form of a control measure such as a design, equipment, work practice or operational standard (whether or not numerical). This definition of the term is independent of the statutory use of the term ''alternative means of emission limitation'' in sections 111(h)(3) and 112(h)(3), which pertain to the conditions under which the EPA may pursuant to sections 111 and 112 promulgate emission limitations, or components of emission limitations, that are not necessarily in numeric format." 80 Fed. Reg 33842.

USEPA then restated the seven criteria for developing AELs, which are as follows:

> (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*. at 33914.

USEPA recognized that it may be appropriate to establish alternative emission limitations for modes of source operation other than startup and shutdown, but the same criteria should be utilized. *Id*. Hot standby is one of these modes of source operation which is implemented in response to a malfunction or breakdown situation. USEPA recognized hot standby as another mode of source operation by including provisions applicable during hot standby periods in NESHAP Subpart UUU.

In the 2015 final rule, USEPA issued findings of substantial inadequacy for SIP provisions applying to excess emissions during SSM periods for 36 states/air agencies, including Illinois, and

issued a SIP Call to each of those states/air agencies, requiring them to adopt and submit revisions to USEPA to correct identified SSM-related deficiencies by November 22, 2016. *Id*. at 33840, 33848, and 33930.

The 2015 SIP final action was then subject to legal challenges. *See Environ. Comm. Fl. Elec. Power v. EPA, et al*., No. 15-1239 (D.C. Cir.) (consolidated cases). In October 2020, USEPA issued a Memorandum establishing a new SSM policy, which permitted the inclusion of SSM provisions related to exemptions and affirmative defenses. "Inclusion of Provisions Governing Periods of Startup, Shutdown, and Malfunctions in State Implementation Plans," USEPA Memorandum (October 9, 2020).[2] In September 2021, USEPA issued a Memorandum withdrawing the 2020 Memorandum and announcing USEPA's intent to return to the 2015 SSM policy. "Withdrawal of the October 9, 2020, Memorandum Addressing Startup, Shutdown, and Malfunctions in State Implementation Plans and Implementation of the Prior Policy," USEPA Memorandum (Sep. 30, 2021).[3]

On January 12, 2022, USEPA published in the Federal Register a final rule finding that 12 States or local air pollution control districts, including Illinois, failed to submit SIP revisions required by the CAA in a timely manner to address USEPA's 2015 findings of substantial inadequacy and SIP Call. *Findings of Failure to Submit State Implementation Plan Revisions in Response to the 2015 Findings of Substantial Inadequacy and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown, and Malfunction*, 87 Fed. Reg. 1680 (Jan. 12, 2022). The 2022 final action became effective on February 11, 2022 and

[2] The 2020 USEPA Memorandum is publicly available on USEPA's website at https://www.epa.gov/system/files/documents/2021-09/2020-ssm-in-sips-guidance-memo.pdf.
[3] The 2021 USEPA Memorandum is publicly available on USEPA's website at https://www.epa.gov/system/files/documents/2021-09/oar-21-000-6324.pdf.

required the impacted states to submit SIP revisions addressing the findings of inadequacy relating to SSM within 18 months from the effective date (i.e., by August 11, 2023). *Id*. at 1682.

C. Illinois EPA Proposal and Board Adopted Rules

In PCB R 23-18, Illinois EPA proposed to "amend the Illinois Administrative Code to remove provisions that allow sources to request, and the [Agency] to grant, advance permission to continue operating during a malfunction, or to violate emission limitations during startup." Illinois EPA Statement of Reasons, PCB R 23-18, at 1 (Dec. 7, 2022). Illinois EPA also requested revision of the definition of "[a]llowable emissions" in Section 202.107 to remove subsection (c) which states "[a]llowable emissions shall include a reasonable estimate of emissions in excess of applicable standards during start-up, malfunction, or breakdown, as appropriate, only if the applicable provisions of 35 Ill. Adm. Code Part 201 have been complied with" 35 Ill. Adm. Code 201.107(c). According to the Agency, removing the provisions at issue in Parts 201, 202, and 212 was necessary to comply with USEPA's SIP Call and Finding of Failure.

Under the Fast Track rulemaking procedures, two hearings were held in PCB R 23-18– one on January 19, 2023 in Springfield and one on February 16, 2023 in Chicago. Pursuant to Illinois EPA's request, the third hearing scheduled was cancelled. Proposed AELs were submitted via pre-filed testimony for the second hearing and were discussed during the second hearing. *See* Second Hearing Transcript, PCB R 23-18 (Feb. 16, 2023). The Illinois Environmental Regulatory Group ("IERG") filed a proposed AEL for FCCUs. Pre-filed Testimony of Kelly Thompson and David Wall, PCB R 23-18 (Feb. 6, 2023). API filed testimony in support of IERG's FCCU proposal. Pre-filed Testimony of John Derek Reese, PCB R 23-18 (Feb. 6, 2023). Post-hearing comments were submitted by the rulemaking participants

on March 7, 2023. Several comments by industrial associations and environmental organizations were submitted throughout the rulemaking. On April 6, 2023, the Board entered its Second Notice Opinion and Order and, within that Order, the Board directed the Clerk to open a sub-docket to consider any proposed AELs. Second Notice Opinion and Order, PCB R 23-18 (Apr. 6, 2023). On July 6, 2023, in this sub-docket rulemaking, the Board established a filing deadline of August 7, 2023 to file any proposed AEL language in this sub-docket. Board Order, PCB R 23-18(A) (July 6, 2023).

On July 20, 2023, over an objection by the Joint Committee on Administrative Rules ("JCAR"), the Board adopted the amendments proposed by Illinois EPA. Final Opinion and Order, PCB R 23-18 (July 20, 2023). The amendments remove all SMB provisions from Parts 201, 202, and 212 that relate to establishing a prima facie defense for exceedances during SMB events and that effectively established permit-based exemptions for periods of SMB. The amendments also revised the definition of "allowable emissions" to remove excess emissions during periods of SMB authorized in permits pursuant to Part 201. The adopted amendments do not include any AELs, or alternative SMB provisions, as the Board declined to adopt the AELs proposed by industry. *See id*.

Throughout the PCB R 23-18 proceeding, Illinois EPA maintained that the amendments were technically and economically reasonable because the amendments did not impose any new or additional obligations on affected sources. *See, e.g.,* Illinois EPA Statement of Reasons, PCB R 23-18, at 15 (Dec. 7, 2022). Illinois EPA argued that the provisions at issue only created an affirmative defense for violations of appliable standards during SMB events. API does not agree with this position. Prior to the Board's July 20, 2023 amendments, Section 201.149 stated:

> No person shall cause or allow the continued operation of an emission source during malfunction or breakdown of the emission source or related air pollution

> control equipment if such operation would cause a violation of the standards or limitations set forth in Subchapter c of this Chapter unless the current operating permit granted by the Agency provides for operation during a malfunction or breakdown. No person shall cause or allow violation of the standards or limitations set forth in that Subchapter during startup unless the current operating permit granted by the Agency provides for violation of such standards or limitations during startup.

35 Ill. Adm. Code 201.149. Section 201.149 previously provided Illinois EPA the authority to issue permits with provisions that allow violation of standards or limitations during startup and allow for the continued operation of an emission source during malfunction or breakdown in violation of limits or standards. There was no reference to only establishing a prima facie defense or to Section 201.265 in that provision.[4]

Furthermore, in the proposal for the 2015 SIP Call, USEPA discussed the various state provisions of concern and USEPA characterized Illinois' provisions as providing advanced permission for exceedances during SSM events. As to Illinois' SMB provisions, USEPA stated:

> The Petitioner objected to three generally applicable provisions in the Illinois SIP which together have the effect of providing discretionary exemptions from otherwise applicable SIP emission limitations, and such exemptions are impermissible under the CAA because the statute and the EPA's interpretation of the CAA in the SSM Policy require that all such excess emissions be treated as violations.
>
> ***
>
> The Petitioner noted that Illinois has claimed that its SIP provisions do not provide for advance permission to violate emission limitations but that its SIP provisions instead authorize "case- by-case claims of exemption." The Petitioner argued that despite this explanation, the language in the SIP is not clear and appears to grant advance permission for violations during malfunction and startup events. Furthermore, the Petitioner objected because the effect of granting that permission would be to provide the source with an absolute defense to any later enforcement action, that is, "a defense [would] attach[] at the state's discretion."

[4] Additionally, the Board promulgated the compliance program provisions, which provided for a prima facie defense, in the same rulemaking. As discussed above, the compliance plan provisions were adopted in order to allow for existing units to have a compliance schedule to install new controls to comply with the standards adopted in the 1972 rulemaking, as opposed to delaying the effective date of the standards. It is clear from the Board's rulemaking history, as well as the Agency's practice, that prima facie provisions were adopted for scenarios where enforcement of the underlying standards was impracticable.

The Petitioner argued that this approach would violate the fundamental requirement that all excess emissions be considered violations.

***

b. The EPA's Evaluation

The EPA agrees that the CAA does not allow for discretionary exemptions from otherwise applicable SIP emission limitations. In accordance with the requirements of CAA section 110(a)(2)(A), SIPs must contain emission limitations and, in accordance with the definition of ''emission limitations'' in CAA section 302(k), such emission limitations must be continuous. Thus, any excess emissions above the level of the applicable emission limitation must be considered violations, whether or not the state elects to exercise its enforcement discretion. The EPA agrees that together Ill. Admin. Code tit. 35 § 201.261, Ill. Admin. Code tit. 35 § 201.262, and Ill. Admin. Code tit. 35 § 201.265148 can be read to create exemptions by authorizing a state official to determine in the permitting process that the excess emissions during startup and malfunction will not be considered violations of the applicable emission limitations. The language of the SIP on its face appears to permit the state official to grant advance permission to ''continue to operate during a malfunction or breakdown'' or ''to violate the standards or limitations * * * during startup'' (Ill. Admin. Code tit. 35 § 201.261(a)).

The EPA notes that the Petitioner's characterization of Illinois's interpretation of its SIP is not accurate. . . . Thus, the state claimed that under its SIP provisions, any excess emissions during periods of startup or malfunction would still constitute a ''violation'' and that the only effect of the permission granted by the state official in the permit would be to allow a source to assert a ''prima facie defense'' in an enforcement action. Even in light of this explanation, the EPA agrees that the plain language of the SIP provisions do not make explicit this limitation on the state official's authorization to grant exemptions. Indeed, by expressly granting ''permission,'' the provisions are ambiguous and 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. By deciding that an exceedance of the emission limitation was not a ''violation,'' exercise of this discretion could preclude enforcement by the EPA or through a citizen suit. Most importantly, however, the grant of permission would authorize the state official to create an exemption from the otherwise applicable SIP emission limitation, and such an exemption is impermissible in the first instance. Such a director's discretion provision undermines the emission limitations and the emission reductions they are intended to achieve and renders them less enforceable by the EPA or through a citizen suit. The EPA believes that the inclusion of director's discretion provisions in Ill. Admin. Code tit. 35 § 201.261, Ill. Admin. Code tit. 35 § 201.262, and Ill. Admin. Code tit. 35 § 201.265 is thus a substantial inadequacy and renders these specific SIP provisions impermissible for this reason.

State Implementation Plans; Response to Petition for Rulemaking; Findings of Substantial Inadequacy; and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown, and Malfunction, 78 Fed. Reg. 12514-15 (Feb. 22, 2013) (internal citations removed) (emphasis added).[5,6] USEPA recognized that the SMB provisions in Part 201 are at best ambiguous and could be read as providing an exemption from otherwise applicable emission limitations.

In line with that ambiguity, Illinois EPA has historically used Section 201.149 as a basis to include broad SMB conditions in construction and operating permits. USEPA's evaluation failed to mention Illinois' only definition of "allowable emissions" found in 35 Ill. Adm. Code 202.107 which explicitly included, in subsection (c) of the definition, Part 201-compliant SMB emissions (i.e., authorized in operating permits), additional evidence of exemption within the SIP. Realizing the significance of this definition, the Agency promulgated a Part 202 revision, which was broader than the scope of the 2015 SIP call, to remove subsection (c) that addressed permit-authorized excess emissions during SMB events. All four Illinois petroleum refineries have SMB relief from the CO standards of 35 Ill. Adm. Code 216.361 in their current operating permits.

Removal of the SMB provisions in Part 201 and related permit conditions will have a detrimental effect on refineries' ability to comply during periods of SMB, particularly startup and hot standby. Refineries have relied upon its past understanding of the SMB provisions and permit conditions. The amendments adopted by the Board do not provide a workable path for

[5] USEPA then goes on to explain that, even if the Illinois SIP provisions cited *intended* to provide only an affirmative defense to enforcement, the prima facie mechanism is not an acceptable affirmative defense provision. *Id*. at 12515 (emphasis added).
[6] All of the Federal Registers cited in this filing are publicly available on the U.S. Government's "GovInfo" website at https://www.govinfo.gov/app/collection/FR/.

compliance for refineries for SMB periods. An alternative emission limitation is required in order for refineries to maintain continuous compliance with Section 216.361.

III. API's REGULATORY PROPOSAL

API is proposing to amend 35 Ill. Adm. Code 216.103, 216.104, and 216.361. API's proposed amendments were drafted in accordance with 1 Ill. Adm. Code 100, Subpart C as required by 35 Ill. Adm. Code 102.202(a). A full copy of the proposed redlines to Part 216 is attached to this Proposal.

It is API's understanding that, if API's Proposal is adopted by the Board, Illinois EPA will submit the adopted AEL to USEPA for approval as a revision to the Illinois SIP. The proposed amendments in API's Proposal have been developed in order to satisfy USEPA's criteria for developing AELs.

A. Amendments to 35 Ill. Adm. Code 216.361

1. Overview

Part 216 of the Board's rules addresses CO emissions. 35 Ill. Adm. Code Part 216. The CO standards are organized by categories of sources: fuel combustion emission sources, incinerators, petroleum refining and chemical manufacture, and primary and fabricated metal products. 35 Ill. Adm. Code 216, Subparts B, C, N, and O. The provisions in Part 216 only contain CO standards – they do not contain requirements for monitoring, testing, recordkeeping, or reporting. *See id*. On the other hand, the federal NESHAP standards at 40 CFR 63 Subpart UUU are more comprehensive. The standards in NESHAP Subpart UUU are based on Maximum Achievable Control Technology ("MACT") and provide requirements for continuous monitoring, testing, recordkeeping and report. 40 CFR 63, Subpart UUU. Under NESHAP

Subpart UUU, CO is regulated as a surrogate for organic HAP species, as low CO is an indication of good combustion, the mechanism for eliminating organic HAPs.

2. Proposed Amendments

API is proposing to amend Section 216.361 of the Board's rules governing CO emissions from petroleum and petrochemical processes. Section 216.361(a) prohibits causing or allowing the emission of a CO waste gas stream into the atmosphere unless such waste gas stream is burned in a direct flame afterburner or CO boiler so that the resulting concentration of CO in such waste gas stream is less than or equal to 200 ppm corrected to 50% excess air. 35 Ill. Adm. Code 216.361(a). For existing petroleum or petrochemical processes using catalyst regenerators of fluidized catalytic converters equipped for in situ combustion of CO, Section 216.361(b) allows emission of a CO waste gas stream if the CO concentration is less than or equal to 750 ppm corrected to 50 percent excess air. 35 Ill. Adm. Code 216.361(b). The CO standards in Section 216.361 for petroleum and petrochemical processes are unachievable for refineries in Illinois during periods of startup and hot standby. Removing the SMB provisions, as proposed by the Agency, will leave refineries with virtually no choice except for noncompliance during periods of startup and hot standby unless an AEL is included in Section 216.361. API hereby proposes to amend Section 216.361 to include alternative CO standards for petroleum and petrochemical processes that would apply during periods of startup and hot standby. Additionally, in conjunction with the proposed amendment to Section 216.361, API proposes amendments to Sections 216.103 and Section 216.104, governing definitions and incorporations by reference respectively.

API proposes the following amendment to Section 216.361, with added language indicated with underlining:

Section 216.361 Petroleum and Petrochemical Processes

a) No person shall cause or allow the emission of a carbon monoxide waste gas stream into the atmosphere from a petroleum or petrochemical process unless such waste gas stream is burned in a direct flame afterburner or carbon monoxide boiler so that the resulting concentration of carbon monoxide in such waste gas stream is less than or equal to 200 ppm corrected to 50 percent excess air, or such waste gas stream is controlled by other equivalent air pollution control equipment approved by the Agency according to the provisions of 35 Ill. Adm. Code 201.

b) Notwithstanding subsection (a), any existing petroleum or petrochemical process using catalyst regenerators of fluidized catalytic converters equipped for in situ combustion of carbon monoxide, may emit a carbon monoxide waste gas stream into the atmosphere if the carbon monoxide concentration of such waste gas stream is less than or equal to 750 ppm corrected to 50 percent excess air.

c) Notwithstanding subsection (a), any new petroleum or petrochemical process using catalyst regenerators of fluidized catalytic converters equipped for in situ combustion of carbon monoxide, may emit a carbon monoxide waste gas stream into the atmosphere if the carbon monoxide concentration of such waste gas stream is less than or equal to 350 ppm corrected to 50 percent excess air.

d) Notwithstanding subsections (a) through (c), during periods of startup and hot standby, any new or existing petroleum catalytic cracking units can elect to comply with subsections (a) through (c) or the alternate limitation for these operating modes in 40 CFR 63 Subpart UUU Tables 9, 10, 14, and 41 and 40 CFR 63.1565(a)(5), 40 CFR 63.1570(c) and (f), 40 CFR 63.1572(c) and 40 CFR 63.1576(a)(2) and (d).

API is proposing to amend Section 216.361 by adding a new subsection (d). The proposed new subsection (d) states that, notwithstanding the generally applicable CO standards in subsection (a) through (c), an alternative limitation can apply during periods of startup and hot standby. Specifically, the proposed AEL includes incorporating by reference work practice standards from the NESHAP for Petroleum Refineries: Catalytic Cracking Units, Catalytic

Reforming Units, and Sulfur Recovery Units at 40 CFR 63, Subpart UUU. The provisions from NESHAP Subpart UUU that API proposes to incorporate by reference are discussed in the following sections.

i. 40 CFR 63.1565(a)(5)

Section 63.1565(a)(5) provides the requirements for organic HAP emissions from catalytic cracking units during periods of startup, shutdown, and hot standby. Section 63.1565(a)(5)(ii) states:

> (a) *What emission limitations and work practice standards must I meet?* You must:
>
> ***
>
> (5) On or before the date specified in § 63.1563(d), you must comply with one of the two options in paragraphs (a)(5)(i) and (ii) of this section during periods of startup, shutdown and hot standby:
>
> ***
>
> (ii) You can elect to maintain the oxygen (O2) concentration in the exhaust gas from your catalyst regenerator at or above 1 volume percent (dry basis) or 1 volume percent (wet basis with no moisture correction).

By incorporating this provision, API intends to provide the sources with FCCUs the option of complying with the oxygen concentration standard in 40 CFR 63.1565(a)(5)(ii) during startup or hot standby in lieu of the CO standards currently in 35 Ill. Adm. Code 216.361.

ii. 40 CFR Part 63, Subpart UUU, Table 9

Table 9 of NESHAP Subpart UUU provides the operating limits for organic HAP emissions from catalytic cracking units. Row 3 of Table 9 states:

For each new or existing catalytic cracking unit . . .	For this type of continuous monitoring system . . .	For this type of control device . . .	You shall meet this operating limit . . .
3. During periods of startup, shutdown or hot standby	Any	Any	Meet the requirements in § 63.1565(a)(5).

Row 3 of Table 9 governs periods of startup, shutdown, or hot standby. By incorporating Table 9, API intends to provide the sources with FCCUs the option of complying with the oxygen concentration standard in 40 CFR 63.1565(a)(5)(ii) during startup or hand standby in lieu of the CO standards currently in 35 Ill. Adm. Code 216.361

iii. 40 CFR 63.1570(c)

40 CFR 63.1570(c) provides the requirement to operate and maintain the source and associated air pollution control equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions. Section 63.1570(c) states:

> (c) At all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. Determination of whether a source is operating in compliance with operation and maintenance requirements will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.

API proposes to incorporate this provision in order to mirror the SMB permit conditions concerning the duty to minimize emissions during SMB periods. Additionally, USEPA's criteria for developing AELs requires that the AEL include a requirement that the frequency and duration of operation in startup or shutdown mode are minimized to the greatest extent

practicable, and that the facility is operated in a manner consistent with good practice for minimizing emissions.

iv. 40 CFR 63.1570(f)

40 CFR 63.1570(f) requires the submittal of reports for each instance when the SSM provisions are not met. Section 63.1570(f) states:

> (f) You must report each instance in which you did not meet each emission limitation and each operating limit in this subpart that applies to you. This includes periods of startup, shutdown, and malfunction. You also must report each instance in which you did not meet the work practice standards in this subpart that apply to you. These instances are deviations from the emission limitations and work practice standards in this subpart. These deviations must be reported according to the requirements in § 63.1575.

By incorporating this provision, API intends for the affected facilities to be required to submit a report to Illinois EPA Bureau of Air Compliance Section for each instance in which the facility did not meet the oxygen concentration standard in 40 CFR 63.1565(a)(5)(ii) and Table 9 during startup or hot standby.

v. 40 CFR 63.1572(c)

40 CFR 63.1572(c) requires the installation and operation of a continuous parameter monitoring system. Section 63.1572(c) states:

> (c) Except for flare monitoring systems, you must install, operate, and maintain each continuous parameter monitoring system according to the requirements in paragraphs (c)(1) through (5) of this section. For flares, on and after January 30, 2019, you must install, operate, calibrate, and maintain monitoring systems as specified in §§ 63.670 and 63.671. Prior to January 30, 2019, you must either meet the monitoring system requirements in paragraphs (c)(1) through (5) of this section or meet the requirements in §§ 63.670 and 63.671.
>
> > (1) You must install, operate, and maintain each continuous parameter monitoring system according to the requirements in Table 41 of this subpart. You must also meet the equipment specifications in Table 41 of this subpart if pH strips or colormetric tube sampling systems are used. You must meet the requirements in Table 41 of this subpart for BLD systems. Alternatively, before August 1, 2017, you may install, operate,

> and maintain each continuous parameter monitoring system in a manner consistent with the manufacturer's specifications or other written procedures that provide adequate assurance that the equipment will monitor accurately.
>
> (2) The continuous parameter monitoring system must complete a minimum of one cycle of operation for each successive 15-minute period. You must have a minimum of four successive cycles of operation to have a valid hour of data (or at least two if a calibration check is performed during that hour or if the continuous parameter monitoring system is out-of-control).
>
> (3) Each continuous parameter monitoring system must have valid hourly average data from at least 75 percent of the hours during which the process operated, except for BLD systems.
>
> (4) Each continuous parameter monitoring system must determine and record the hourly average of all recorded readings and if applicable, the daily average of all recorded readings for each operating day, except for BLD systems. The daily average must cover a 24-hour period if operation is continuous or the number of hours of operation per day if operation is not continuous, except for BLD systems.
>
> (5) Each continuous parameter monitoring system must record the results of each inspection, calibration, and validation check.

This provision requires the installation and operation of a continuous parameter monitoring system. Each of the four refineries operate a continuous parameter monitoring system, an oxygen content sensor, which demonstrates compliance with the oxygen concentration limit in 40 CFR 63.1565(a)(5)(ii) and Table 9 during periods of startup or hot standby.

vi. 40 CFR Part 63, Subpart UUU, Table 10

NESHAP Subpart UUU, Table 10 provides requirements for the continuous monitoring systems for organic HAP emissions from catalytic cracking units. Table 10, Row 3 states:

For each new or existing catalytic cracking unit . . .	And you use this type of control device for your vent . . .	You shall install, operate, and maintain this type of continuous monitoring system . . .

3. During periods of startup, shutdown or hot standby electing to comply with the operating limit in § 63.1565(a)(5)(ii)	Any	Continuous parameter monitoring system to measure and record the concentration by volume (wet or dry basis) of oxygen from each catalyst regenerator vent. If measurement is made on a wet basis, you must comply with the limit as measured (no moisture correction).

This provision requires the installation and operation of a continuous parameter monitoring system. Each of the four refineries operate a continuous parameter monitoring system, an oxygen content sensor, which demonstrates compliance with the oxygen concentration limit in 40 CFR 63.1565(a)(5)(ii) and Table 9 during periods of startup or hot standby.

vii. 40 CFR Part 63, Subpart UUU, Table 14

NESHAP Subpart UUU, Table 14 provides the requirements for continuous compliance with operating limits for organic HAP emissions from catalytic cracking units. Table 14, Row 3 states:

For each new or existing catalytic cracking unit . . .	If you use. . .	For this operating limit . . .	You shall demonstrate continuous compliance by . . .
3. During periods of startup, shutdown or hot standby electing to comply with the operating limit in § 63.1565(a)(5)(ii).	Any control device	The oxygen concentration limit in § 63.1565(a)(5)(ii)	Collecting the hourly average oxygen concentration monitoring data according to § 63.1572 and maintaining the hourly average oxygen concentration at

			or above 1 volume percent (dry basis).

The above provision provides how the sources will demonstrate continuous compliance with the oxygen concentration limit in 40 CFR 63.1565(a)(5)(ii).

viii. 40 CFR 63.1576(d)

40 CFR 63.1576(d) references the continuous compliance requirements during startup, shutdown, and hot standby. Section 63.1576(d) states:

> (d) You must keep records required by Tables 6, 7, 13, and 14 of this subpart (for catalytic cracking units); Tables 20, 21, 27 and 28 of this subpart (for catalytic reforming units); Tables 34 and 35 of this subpart (for sulfur recovery units); and Table 39 of this subpart (for bypass lines) to show continuous compliance with each emission limitation that applies to you.

API proposes to incorporate this provision in order to incorporate the continuous compliance requirements of Table 14, Row 3, as discussed in the above subsection.

ix. 40 CFR Part 63, Subpart UUU, Table 41

NESHAP Subpart UUU, Table 41 provides the requirements for installation, operation, and maintenance of continuous parameter monitor systems. Table 41, Row 10 states:

If you use . . .	You shall . . .
3. Oxygen content sensors[2]	Locate the oxygen sensor so that it provides a representative measurement of the oxygen content of the exit gas stream; ensure the sample is properly mixed and representative of the gas to be measured.
	Use an oxygen sensor with an accuracy of at least ±1 percent of the range of the sensor or to a nominal gas concentration of ±0.5 percent, whichever is greater.
	Conduct calibration checks at least annually; conduct calibration checks following any period of more than 24 hours throughout which the sensor

	reading exceeds the manufacturer's specified maximum operating range or install a new oxygen sensor; at least quarterly, inspect all components for integrity and all electrical connections for continuity; record the results of each calibration and inspection.

[2] This does not replace the requirements for oxygen monitors that are required to use continuous emissions monitoring systems. The requirements in this table apply to oxygen sensors that are continuous parameter monitors, such as those that monitor combustion zone oxygen concentration and regenerator exit oxygen concentration.

This provision provides the operation and maintenance requirements for the oxygen content sensors.

x. 40 CFR 63.1576(a)(2)

40 CFR 63.1576(a)(2) requires a variety of records concerning SSM events to be maintained. Section 63.1576(a)(2) states:

> (a) You must keep the records specified in paragraphs (a)(1) through (3) of this section.
>
> ****
>
> (2) The records specified in paragraphs (a)(2)(i) through (iv) of this section.
>
> (i) Record the date, time, and duration of each startup and/or shutdown period for which the facility elected to comply with the alternative standards in § 63.1564(a)(5)(ii) or § 63.1565(a)(5)(ii) or § 63.1568(a)(4)(ii) or (iii).
>
> (ii) In the event that an affected unit fails to meet an applicable standard, record the number of failures. For each failure record the date, time and duration of each failure.
>
> (iii) For each failure to meet an applicable standard, record and retain a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over any emission limit and a description of the method used to estimate the emissions.
>
> (iv) Record actions taken to minimize emissions in accordance with § 63.1570(c) and any corrective actions taken to return the affected unit to its normal or usual manner of operation.

In proposing to incorporate these provisions, API intends for the refineries to be required to maintain records of the date, time, and duration of each startup period for which the facility elected to comply with the oxygen concentration limit in Section 63.1565(a)(5)(ii). In the event that an FCCU fails to meet the oxygen concentration limit in Section 63.1565(a)(5)(ii) during startup or hot standby, the facility would be required to record the number of failures, including the date, time, and duration of each failure. Additionally, for each failure to meet the oxygen concentration limit in Section 63.1565(a)(5)(ii) during startup or hot standby, the facility would be required to record and retain a list of the affected sources or equipment (i.e., the FCCU), an estimate of the volume of each regulated pollutant emitted over any emission limit, and a description of the method used to estimate the emissions. Lastly, the facility would be required to record actions taken to minimize emissions in accordance with 40 CFR 63.1570(c) and any corrective action taken. The inclusion of these recordkeeping requirements are intended to satisfy USEPA's AEL criterion requiring that the owner or operator's actions during startup or shutdown periods are documented by properly signed, contemporaneous operating logs or other relevant evidence.

3. Hot Standby

As proposed by API, the existing standards in Section 216.361 would continue to be the CO standards applicable during normal, steady-state operation. API proposes to incorporate by reference the above NESHAP Subpart UUU provisions so that the affected sources can have the option to comply with the Subpart UUU provisions during periods of startup and hot standby in lieu of the Section 216.361 standards during those modes of operation.

USEPA understood the concerns with meeting the generally applicable MACT standard during periods of startup and hot standby. API acknowledges that the prior SMB provisions in

35 Ill. Adm. Code Part 201 did not address hot standby. Hot standby is a mode of FCCU operation which is implemented in response to a malfunction or breakdown situation. Hot standby can be used when there is a unit upset that takes another unit down and the FCCU can be paused without having to shut the unit completely down. Hot standby avoids a subsequent cold start, which can have higher CO emissions and has more associated process safety risks. USEPA recognized hot standby as another mode of source operation by including provisions applicable during hot standby periods in NESHAP Subpart UUU. Therefore, it is appropriate that the proposed AEL address periods of both startup and hot standby.

B. Amendments to 35 Ill. Adm. Code 216.103 and 216.104

In conjunction with the proposed amendments to Section 216.361, API proposes amendments to Sections 216.103 and Section 216.104, governing definitions and incorporations by reference, respectively. Specifically, API proposes to amend Section 216.103 and 216.104 as follows:

> Section 216.103 Definitions
>
> The definitions contained in 35 Ill. Adm. Code 201 and 211 apply to this Part. The definitions for "catalytic cracking unit" and "hot standby" in 40 CFR 63.1579 apply to Section 216.361(d) of this Part. The definition of "startup" in 40 CFR 63.2 applies to Section 216.361(d) of this Part.
>
> Section 216.104 Incorporations by Reference
>
> The following materials are incorporated by reference: non-dispersive infrared method, 40 CFR 60, Appendix A, Method 10 (1982); 40 CFR Part 63, Subpart A (2022); 40 CFR Part 63, Subpart UUU (2022).

API is proposing to incorporate provisions of NESHAP Subpart UUU into Section 216.361, as discussed above. The Subpart UUU provisions proposed to be incorporated include the terms "catalytic cracking unit," "hot standby," and "startup." Neither Part 201 nor Part 211 of the Board's air regulations include definitions for "catalytic cracking unit" or "hot standby."

Part 211 does include a definition for the term "start-up." 35 Ill. Adm. Code 211.6310. However, this definition differs from the definition of "startup" under Subpart UUU. Therefore, API proposes to define the term consistent with the Subpart UUU provisions that API proposes to incorporate.

API proposes to amend Section 216.103 of the Board's regulations to reference the definitions of "catalytic cracking unit" and "hot standby" contained in NESHAP Subpart UUU, and the definition of "startup" contained in the NESHAP General Provisions in NESHAP Subpart A. These definitions are as follows:

"Catalytic cracking unit" definition in 40 CFR 63.1579:

> *Catalytic cracking unit* means a refinery process unit in which petroleum derivatives are continuously charged; hydrocarbon molecules in the presence of a catalyst suspended in a fluidized bed are fractured into smaller molecules, or react with a contact material suspended in a fluidized bed to improve feedstock quality for additional processing; and the catalyst or contact material is continuously regenerated by burning off coke and other deposits. The unit includes, but is not limited to, the riser, reactor, regenerator, air blowers, spent catalyst or contact material stripper, catalyst or contact material recovery equipment, and regenerator equipment for controlling air pollutant emissions and equipment used for heat recovery.

"Hot standby" definition in 40 CFR 63.1579:

> *Hot standby* means periods when the catalytic cracking unit is not receiving fresh or recycled feed oil but the catalytic cracking unit is maintained at elevated temperatures, typically using torch oil in the catalyst regenerator and recirculating catalyst, to prevent a complete shutdown and cold restart of the catalytic cracking unit.

"Startup" definition in 40 CFR 63.2:

> *Startup* means the setting in operation of an affected source or portion of an affected source for any purpose.

API also proposes to amend Section 216.104 to incorporate by reference NESHAP Subpart A and Subpart UUU. As discussed above, sections of both NESHAP Subpart A and NESHAP Subpart UUU are referenced in API's proposed amendment to Section 216.361.

IV. JUSTIFICATION FOR PROPOSED AMENDMENTS

A. MACT Background

The alternative emission limitations and standards proposed by API are from NESHAP Subpart UUU and were promulgated by USEPA in December 2015. *See Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards*, 80 Fed. Reg. 75178 (Dec. 1, 2015).[7] The amendments relating to SSM were proposed in response to the Sierra Club Petition and to address USEPA's concerns regarding general SSM exemptions. *Id*. At 75184. Specifically, USEPA removed the SSM exemption provisions or references from NESHAP Subpart UUU and inserted alternative emission standards during periods of SSM. *Id*. USEPA explained:

> In proposing the standards in this rule, the EPA has taken into account startup and shutdown periods and, for the reasons explained below, we are proposing alternate standards for those periods for a few select emission sources. We expect facilities can meet nearly all of the emission standards in Refinery MACT 1 and 2 during startup and shutdown, including the amendments we are proposing in this action. For most of the emission sources, APCD are operating prior to process startup and continue to operate through process shutdown.
>
> For Refinery MACT 1 and 2, we identified three emission sources for which specific startup and shutdown provisions may be needed. First, as noted above, most APCD used to control metal HAP emissions from FCCU under Refinery MACT 2 (e.g., wet scrubber, fabric filter, cyclone) would be operating before emissions are routed to them and would be operating during startup and shutdown events in a manner consistent with normal operating periods, such that the monitoring parameter operating limits set during the performance test are maintained and met. However, we recognize that there are safety concerns associated with operating an ESP during startup of the FCCU, as described in the

[7] This Federal Register is publicly available on the U.S. Government Information website at https://www.govinfo.gov/content/pkg/FR-2015-12-01/pdf/2015-26486.pdf.

following paragraphs. Therefore, we are proposing specific PM standards for startup of FCCU controlled with an ESP under Refinery MACT 2.

During startup of the FCCU, ‘‘torch oil’’ (heavy oil typically used as feed to the unit via the riser) is injected directly into the regenerator and burned to raise the temperature of the regenerator and catalyst to levels needed for normal operation. Given the poor mixing of fuel and air in the regenerator during this initial startup, it is difficult to maintain optimal combustion characteristics, and high CO concentrations are common. Elevated CO levels pose an explosion threat due to the high electric current and potential for sparks within the ESP. Consequently, it is common practice to bypass the ESP during startup of the FCCU. Once torch oil is shut off and the regenerator is fueled by catalyst coke burn-off, the CO levels in the FCCU regenerator off-gas will stabilize and the gas can be sent to the ESP safely.

***

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.

Based on available data during normal operations, ensuring adequate combustion (indicated by CO concentration levels below 500 ppmv) minimizes organic HAP emissions. Low levels of CO in the exhaust gas are consistently achieved during normal operations when oxygen concentrations in the exhaust gas exceed 1-percent by volume (dry basis). Thus, maintaining an adequate level of excess oxygen for the combustion of fuel in the FCCU is expected to minimize organic HAP emissions. 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.

Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards, 79 Fed. Reg. 36880, 36943 (June 30, 2014).[8]

USEPA understood the concerns with meeting the generally applicable MACT standard during periods of startup and hot standby.

B. Seven Criteria for Alternative Emissions Limitations

In the June 12, 2015 SSM final action, USEPA recognized that there are approaches to address emissions during SSM events that are consistent with the requirements of the CAA. 80 Fed. Reg. 33840, 33844 (June 12, 2015). USEPA explained that, "SIPs may, rather than exempt emissions during SSM events, include emission limitations that subject those emissions to alternative numerical limitations or other technological control requirements or work practice requirements during startup and shutdown events, so long as those components of the emission limitations meet applicable CAA requirements." *Id*. USEPA reiterated that alternative requirements applicable during periods of SSM must be "narrowly tailored and take into account considerations such as the technological limitations of the specific source category and the control technology that is feasible during startup and shutdown" in order to be approvable. *Id*. at 33913. USEPA also recognized that it may be appropriate to establish alternative emission limitations for modes of source operation other than startup and shutdown, but the same seven criteria should be utilized. *Id*.

In the sections below, API walks through each of the seven criteria as justification for API's proposed amendments to Section 216.361.

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).

[8] This Federal Register is publicly available on the U.S. Government Information website at https://www.govinfo.gov/content/pkg/FR-2014-06-30/pdf/2014-12167.pdf.

API's proposed amendments to Part 216 are limited to specific, narrowly defined source categories using specific control strategies. The proposed amendments are limited to FCCUs as defined in the federal MACT standard. There are only four petroleum refineries in Illinois. All of the FCCUs at the refineries in Illinois are controlled by CO boilers or CO furnaces during steady-state operation.

Under NESHAP Subpart UUU, the generally applicable CO standard applicable to FCCUs is CO emissions from the FCCU regenerator or CO boiler serving the FCCU must not exceed 500 ppmv (dry 1-hour basis). 40 CFR 63.1565(a)(1); 40 CFR 63, Subpart UUU Table 8. During periods of startup, shutdown, or hot standby, a source can elect to comply with the alternative standard of maintaining the oxygen concentration in the exhaust gas of the FCCU regenerator at or above 1 volume percent (dry basis) or 1 volume percent (wet basis with no moisture correction). 40 CFR 63.1565(a)(5).

The Illinois regulations at Section 216.361 provide a more stringent generally applicable CO standard of 200 ppm corrected to 50% excess air. 35 Ill. Adm. Code 216.361(a). As proposed by API, the existing 216.361 standards would continue to be the CO standards applicable during normal operation. USEPA understood the concerns with meeting the MACT standard during periods of startup, shutdown, and hot standby. Thus, it is appropriate that the alternative emission limitation and standards under NESHAP Subpart UUU would apply to periods of startup and hot standby under Section 216.361.

2. Use of the control strategy for this source category is technically infeasible during startup or shutdown periods.

CO emissions from an FCCU are the result of incomplete combustion when coke deposits are burned off the circulating catalyst in the FCCU regenerator. As with any type of combustion, the factors that influence complete combustion include time, temperature, and

turbulence. During normal operations, a typical FCCU operates in either full burn mode or in partial burn mode with CO emissions controlled by a CO boiler. Under either of these scenarios, good combustion is achievable and CO emissions can be minimized. When operating normally, an FCCU is essentially in a thermodynamic balance as the heat from combusting the coke deposits is utilized in cracking the feed to the unit. However, during startup, there is no feed to the unit and no coke combustion. For the unit to operate properly and safely, it first must be brought up to the proper operating temperature. This is done through the combustion of torch oil. When combusting torch oil and bringing the unit up to temperature, elevated CO emissions occur. Depending on how long the FCCU had been shut down prior to the startup (i.e., how much it has cooled off), the startup can take hours or even days to safely reach the proper operating temperature. It is not technically feasible to meet the CO standard during this startup period.

More specifically, the FCCUs in Illinois use CO boilers to control CO. Typically, the FCCUs will startup in full burn mode and the source will bypass the CO boiler during startup. This is because of safety and reliability concerns – starting up a FCCU in full burn mode through CO boilers is generally not safe or reliable. These concerns were detailed in comments submitted to USEPA during the NESHAP Subpart UUU rulemaking:

> *Comment*: Several commenters stated that the EPA should provide alternate standards for startups of FCCU equipped with CO boilers and for any FCCU during periods of shutdown and hot standby. The commenters stated that the EPA incorrectly assumes that refiners are able to safely and reliably start up their FCCU with flue gas boilers in service and meet the normal operating limit of 500 ppm CO. They claimed that most refiners are unable to reliably start up their FCCU with flue gas boilers in service due to the design of the boiler and the fact that many boilers are not able to safely and reliably handle the transient FCCU operations that can occur during startup, shutdown, and hot standby. One commenter stated that FCCU built with CO boilers experience issues with flame stability due to fluctuating flue gas compositions and rates when starting up and shutting down. Accordingly, the commenter stated, startup and shutdown

activities at FCCU using a boiler as an APCD are not currently meeting the Refinery MACT 2 standard of 500 ppm CO on a 1-hour basis, and this level of control does not qualify as the MACT floor. The commenter gave examples of facilities where FCCU, including those equipped with post- combustion control systems, do not consistently demonstrate compliance with a 500 ppm CO concentration standard during all startup and shutdown events.

Commenters stated that reliable boiler operation is critical to the overall refinery steam system and refineries must avoid jeopardizing boiler operation to prevent major upsets of process operations. A major upset or site-wide shutdown could result in flaring and emissions of HAP far in excess of that emitted while bypassing the CO boiler.

Commenters stated that combustion of torch oil in the FCCU regenerator during startup is one of the primary reasons the CO limit cannot be met during these operations. Torch oil is also used during shutdown to control the cooling rate (and potential equipment damage) and during hot standby and, thus, the normal CO standard cannot be met at these times either. Hot standby is used to hold an FCCU regenerator at operating temperature for outages where a regenerator shutdown is not needed and to avoid full FCCU shutdowns. Full cold shutdown also increases personnel exposures associated with removing catalyst and securing equipment. Additionally, this can produce additional emissions over maintaining the unit in hot standby. Commenters claimed that because of the variability of CO during torch oil operations, it is not possible for the EPA to establish a CAA section 112(d) standard for startup and shutdown activities at FCCU because refineries cannot measure a constant level of emissions reductions.

The commenters recommended expansion of the proposed standard of greater than 1-percent hourly average excess regenerator oxygen to all FCCU, including units with fired boilers. These commenters suggested that maintaining an adequate level of excess oxygen for the combustion of fuel in the regenerator is the best way to minimize CO and organic HAP emissions from FCCU during these periods.

Response: After reviewing the comments and discussing CO boiler operations with facility operators, we agree that the 1-percent minimum oxygen limit should be more broadly applicable to FCCU startup and shutdown regardless of the control device configuration and have revised the final rule accordingly.

80 Fed. Reg. 75178, 75220-75221 (Dec. 1, 2015).

As explained above, starting up an FCCU in full burn mode through CO boilers is generally not safe or reliable. Also, as explained above and recognized by USEPA, the generally

applicable CO limit is simply not achievable during startup periods. It is technically infeasible to meet these CO limits during startup periods.

Similarly, FCCUs can experience elevated CO emissions during hot standby. Hot standby is a mode of source operation that is implemented in response to a malfunction or breakdown situation. As with startup, during hot standby the unit is typically not receiving feed and torch oil is combusted to maintain heat within the unit. Hot standby is essentially similar to startup operation conditions. It is not technically feasible to control CO emissions during hot standby operations.

Malfunctions may result if a refinery attempts to limit CO emissions versus the priority focus on the complete and full combustion of oil feedstocks while transitioning to full operations. During this period, the potential for un-combusted hydrocarbon is a critical concern. The consequences of this material finding a source of ignition can be very serious. Some examples of refinery incidents where this has occurred include the February 18, 2015 explosion at the ExxonMobil Torrance, California refinery ESP as well as the April 26, 2018 explosion at the Husky Energy refinery in Superior, Wisconsin.[9, 10] In response to Chemical Safety Board ("CSB") recommendations, industry has developed key work practice standards to address the safe operations during these periods as well as holding seminars and trainings on this very issue, to ensure the health and safety of employees at the facilities during these technically complex procedures.

Without the proposed AEL provisions, the Board is not taking into account known process safety hazards as well as setting emission limitations that are in direct opposition to "Recognized

[9] The Chemical Safety Board investigation information is publicly available at https://www.csb.gov/exxonmobil-refinery-explosion-/.
[10] The Chemical Safety Board investigation information is publicly available at https://www.csb.gov/husky-energy-refinery-explosion-and-fire.

and generally accepted good engineering practices" ("RAGAGEP") for these sources. While the Occupational Safety and Health Administration ("OSHA") originally coined the terminology, RAGAGEP involves the application of engineering, operating or maintenance activities derived from engineering knowledge and industry experience based upon the evaluation and analyses of appropriate internal and external standards, applicable codes, technical reports, guidance, or recommended practices or documents of a similar nature. EPA's Risk Management Program, 40 CFR Part 68, and OSHA's Process Safety Management, 29 CFR Part 1910, specifically direct refineries to adhere to RAGAGEP to ensure the safe operation of their facilities.

As currently written, the Board has placed refineries with FCCUs in a position where they must make an untenable operating decision. They must attempt to startup or go into hot standby with a known process safety hazard with potentially serious consequences in direct conflict with RAGAGEP or remain shutdown until Illinois EPA has approved alternative operating conditions and emission limitations. This scenario is completely avoidable as industry and USEPA have already aligned on the proper and safe operating conditions and alternative emission limitations for FCCU startup and hot standby. These procedures and operation conditions have been safely used by all U.S, refineries since 2016.

Additional discussion on the technical infeasibility of complying with the CO standards in Section 216.361 during startup and hot standby are provided in the Technical Support Document, attached hereto as Exhibit 1.

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.

FCCUs are the primary gasoline-making units in petroleum refineries and operate year-round to provide essential products. Sources with FCCUs have planned startup and shutdowns

for periodic maintenance events (multi-year turnaround cycle). Each startup of a FCCU after a maintenance event is unique, depending on what, if any, other units are down for maintenance.

API is proposing to incorporate the general duty to minimize emissions under NESHAP Subpart UUU, which states, in part:

> At all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. . . .

40 CFR 63.1570(c). As such, API's proposed alternative emission limitation includes a requirement to minimize emissions at all times, including during startup. Furthermore, it is to each refinery's benefit to complete startup as quickly as possible. The FCCU is a critical operating unit for a refinery. When an FCCU is down or not operating normally, refineries typically operate the entire plant at significantly reduced production rates or not at all. Lost production and the economic consequences are a strong incentive to minimum startup time. Therefore, there is an inherent goal to minimize the time of startup as much as is safely practicable, which in turn minimizes emissions during startup.

It is important to note that FCCU startups and shutdowns are infrequent events. FCCUs typically have run lengths between 5-7 years between major maintenance activities (ie., turnarounds). Unplanned FCCU shutdowns and startups are related to rare but known root causes of weather events, power failures, or unexpected equipment failures. It would be unusual for a refinery to experience more than a single FCCU startup/shutdown sequence in a given year. These startup sequences typically last from 2-4 days and the period of elevated CO concentrations is actually a small subset of that period (e.g., 24-36 hours).

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.

In the 2015 SIP Call final rule, USEPA included a response to comments that provided further clarity on the information required for an approvable alternative emissions limitation. USEPA explained:

> The EPA does not agree with the comment that suggests ''worst-case modeling'' would always be needed to show that a SIP revision establishing alternative emission limitations for startup and shutdown would not interfere with attainment or reasonable further progress. The nature of the technical demonstration needed under section 110(l) to support approval of a SIP revision depends on the facts and circumstances of the SIP revision at issue. The EPA will evaluate SIP submissions that create alternative emission limitations applicable to certain modes of operation such as startup and shutdown carefully and will work with the states to assure that any such limitations are consistent with applicable CAA requirements. Under certain circumstances, there may be alternative emission limitations that necessitate a modeling of worst-case scenarios, but those will be determined on a case-by-case basis.

80 Fed. Reg. 33840, 33867 (June 12, 2015).

It is API's understanding that other states either do not have CO standards for FCCUs or they exempt units subject to federal regulations. *See, e.g.*, Indiana regulations at 326 IAC 9-1-1(b)(1), (b)(5), and 9-1-2; *see, e.g.*, California - Bay Area Air Quality Management District regulations at 9-10-305 (explicitly exempting periods of startup, shutdown, and curtailed operation (<30%)).[11] Therefore, the 200 ppm CO limit in Section 216.361 is unique to Illinois.

With respect to emission impacts of alternative CO standard proposed by API, all petroleum refineries in Illinois currently have FCCU SMB relief provisions in their operating permits and currently rely on the excess emission authorizations. Below is an example of a startup provision in a current Clean Air Act Permit Program ("CAAPP") permit:

[11] The Indiana regulations referenced are available at http://iac.iga.in.gov/iac//iac_title?iact=326. The BAAQMD regulations referenced are publicly available at https://www.baaqmd.gov/~/media/dotgov/files/rules/refinery-rules-definitions/rg0910_20211103-pdf.pdf?la=en&rev=6e3872940d924000b45ea05f05b5a309.

e. Startup Provisions

> Subject to the following terms and conditions, the Permittee is authorized to operate the fluid catalytic cracking unit in violation of Condition 7.3.3(b) and (c) during startup. This authorization is provided pursuant to 35 IAC 201.149, 201.161 and 201.262, as the Permittee has applied for such authorization in its application, generally describing the efforts that will be used ". . . to minimize startup emissions, duration of individual startups and frequency of startups."

Permit Condition 7.3.3(c) referenced in the above excerpt sets forth the 200 ppm corrected to 50% excess air emission limit in 35 Ill. Adm. Code 216.361(a). Thus, the above startup provision states that, subject to the following terms and conditions, the permittee is authorized to operate the FCCU in violation of the limit in Section 216.361(a) during startup. There are additional provisions under this paragraph in the permit including startup-related recordkeeping requirements and a provision stating that the authorization does not relieve the permittee from the continuing obligation to demonstrate that all reasonable efforts are made to minimize startup emissions duration of individual startups, and frequency of startups.

The above permit example includes a provision that states:

> iv. As provided by 35 IAC 201.265, an authorization in a permit for excess emissions during startup does not shield a Permittee from enforcement for any violation of applicable emission standard(s) that occurs during startup and only constitutes a prima facie defense to such an enforcement action provided that the Permittee has fully complied with all terms and conditions connected with such authorization.

Per the first paragraph above, the permittee is authorized to operate the FCCU in violation of the limit in Section 216.361(a) during startup. The second paragraph immediately above states that such authorization does not shield a permittee from enforcement for any violation of the standard but constitutes a prima face defense to such enforcement action. However, it is API's understanding that the long-standing practice has been that, if SMB provisions were included in a permit, Illinois EPA considered those excess emissions authorized

in operating permits within the scope of allowable emissions and would not seek enforcement. Below is an example of a malfunction and breakdown provision in a current CAAPP Permit:

> f. Malfunction and Breakdown Provisions
>
> Subject to the following terms and conditions, the Permittee is authorized to continue operation of the fluid catalytic cracking unit in violation of the applicable requirements of Conditions 7.3.3(b) and (c) in the event of a malfunction or breakdown of the CO boiler and/or the ESP on the affected fluid catalytic cracking unit.
>
> This authorization is provided pursuant to 35 IAC 201.149, 201.161 and 201.262, as the Permittee has applied for such authorization in its application, generally explaining why such continued operation would be required to provide essential service or to prevent injury to personnel or severe damage to equipment, and describing the measures that will be taken to minimize emissions from any malfunctions and breakdowns. This authorization supersedes the general prohibition in Condition 9.2.3 against continued operation in such circumstances.
>
> i. This authorization only allows such continued operation as necessary to provide essential service or to prevent injury to personnel or severe damage to equipment and does not extend to continued operation solely for the economic benefit of the Permittee.

Per the above provision, the permittee is authorized to continue operation of a FCCU in violation of the 200 ppm corrected to 50% excess air emission limit in 35 Ill. Adm. Code 216.361(a). Continued operation is only allowed during malfunction or breakdown if it is necessary to provide essential service or to prevent injury to personnel or severe damage to equipment.

Also, all petroleum refineries are subject to NESHAP Subpart UUU and the associated startup provisions (compliance required on or before January 30, 2019). As part of compliance with federal NESHAP and NSPS rules, these facilities have CO continuous emissions monitoring systems ("CEMS") that collect continuous emissions data during all periods of operation, including periods when the CO boilers are bypassed. As such, these "worst-case emissions" for all operating scenarios are already reported and captured in the Illinois emission

inventory. As Illinois removes the SMB provisions from the SIP and institutes the federal Subpart UUU alternative approach for CO, there should be no impact on allowable emissions relative to today.

Additionally, below are a few facts on CO emissions in Illinois based on the most recent Annual Air Quality Report:

- Illinois has never had any portions of the state designated as nonattainment for CO, and has no violating CO monitors for either the 1-hour (35 ppm) or 8-hour (9 ppm) CO National Ambient Air Quality Standards ("NAAQS").
- The CO NAAQS allows for one exceedance per year. 40 CFR 50.8(a)(1)-(2).
- Most recent Illinois data shows the highest monitor's worst daily high 1-hour and 8-hour CO NAAQS readings are dramatically below the NAAQS.
- The petroleum refinery CO emissions (as described earlier, FCC emissions are monitored and quantified using CO CEMS, including non-steady-state periods of operation) are a small fraction of the Illinois point source inventory, only 4%.

Illinois Air Quality Report, Illinois EPA (2021).[12]

Including mobile source and other inventory sectors, the petroleum refinery CO emissions are an extremely small fraction of the Illinois inventory, only 0.2% (based on 2016 emissions). *See* Lake Michigan Air Directors Consortium ("LADCO"), "Attainment Demonstration Modeling for the 2015 Ozone NAAQS, Technical Support Document," Table 4-2 (Sep. 21, 2022).[13] Given the above, API's proposal would have no impact on "worst case" FCC

[12] This report is publicly available on Illinois EPA's website at: https://epa.illinois.gov/content/dam/soi/en/web/epa/topics/air-quality/air-quality-reports/documents/2021-Annual-Air-Quality-Report.pdf.

[13] The Technical Support Document is publicly available on LADCO's website at https://www.ladco.org/wp-content/uploads/Projects/Ozone/ModerateTSD/LADCO_2015O3_ModerateNAASIP_TSD_21Sep2022.pdf.

emissions reported today. Additionally, the current emissions are a very small fraction of the state's inventory (approximately two one-thousandths). One of the refineries conducted screening modeling of impacts using continuous emission monitoring system ("CEMS") data from recent startup events to conservative estimate of ambient impacts during these events. The incremental emission impacts during startups were less than 3% and 6% of the 1-hour and 8-hour standards, respectively.

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.

USEPA's discussion of the MACT alternative emission limitation in the NESHAP Subpart UUU rulemaking supports this criterion. USEPA explained that bypassing the CO boiler during startup of the FCCU ensures adequate combustion, which minimizes organic hazardous air pollutant ("HAP") emissions. 79 Fed. Reg. 36880, 36943 (June 30, 2014). USEPA explained:

> Low levels of CO in the exhaust gas are consistently achieved during normal operations when oxygen concentrations in the exhaust gas exceed 1-percent by volume (dry basis). Thus, maintaining an adequate level of excess oxygen for the combustion of fuel in the FCCU is expected to minimize organic HAP emissions.

Id. USEPA further explained:

> Comment: …. The commenters recommended expansion of the proposed standard of greater than 1-percent hourly average excess regenerator oxygen to all FCCU, including units with fired boilers. These commenters suggested that maintaining an adequate level of excess oxygen for the combustion of fuel in the regenerator is the best way to minimize CO and organic HAP emissions from FCCU during these periods.
>
> Response: After reviewing the comments and discussing CO boiler operations with facility operators, we agree that the 1-percent minimum oxygen limit should be more broadly applicable to FCCU startup and shutdown regardless of the control device configuration and have revised the final rule accordingly.

80 Fed. Reg. 75221.

API is proposing to incorporate by reference the MACT 1% by volume (dry basis or wet basis with no moisture correction) alternative emission limitation into Section 216.361 during periods of startup and hot standby. API's proposal will minimize the impact of emissions of CO and HAP during startup 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.

API is proposing to incorporate the general duty to minimize emissions under NESHAP Subpart UUU into Section 216.361. The general duty to minimize emissions under NESHAP Subpart UUU states, in part:

> At all times, you must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by the applicable standard have been achieved. . . .

40 CFR 63.1570(c).

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.

The NESHAP Subpart UUU provisions that API is proposing to incorporate into Section 216.361 address this criterion. 40 CFR 63.1572(c) requires the operation of a continuous parametric monitoring system ("CPMS") for oxygen in the FCCU regenerator exhaust. The CPMS must meet the requirements of 40 CFR 63.1572(c) and Tables 10 and 41 of NESHAP Subpart UUU (including recording a value at a minimum frequency of 15 minutes). API is also proposing to incorporate the applicable recordkeeping provisions in 40 CFR 63.1576(a)(2) and (d). Specifically, Section 63.1576(a)(2)(i) requires the source to record the date, time, and

duration of each startup period for which the source elected to comply with 40 CFR 63.1565(a)(5)(ii).

V. PURPOSE AND EFFECT OF PROPOSAL

The purpose of API's Proposal is to amend Part 216 of the Board's rules governing CO emissions from petroleum and petrochemical processes to provide alternate standards applicable during periods of startup and hot standby. The CO standards in Section 216.361 are unachievable for the refineries in Illinois during periods of startup and hot standby. The removal of the SMB provisions in Part 201 leave affected entities in Illinois with no technically feasible option for compliance with Sections 216.361 during periods of startup and hot standby. API is not aware of any control equipment options available for the refineries to comply with the standards in Section 216.361, as applicable, during periods of startup and hot standby given the physical limitations of the FCCUs as explained above and further explained in the Technical Support Document. *See* Exhibit 1.

The effect of API's Proposal is to provide refineries with an option to comply with alterative standards for CO that apply during periods of startup and hot standby so that the refineries can continue to operate in compliance during periods of startup and hot standby. As explained above, the proposed alternative standards for CO are based on the federal MACT standards in NESHAP Subpart UUU. The refineries in Illinois are already subject to NESHAP Subpart UUU and, to API's knowledge, utilize the alternate emission standards proposed to be incorporated. API's Proposal, if adopted, will not result in any adverse harm to the environment or human health, as explained in the Technical Support Document. *See* Exhibit 1.

VI. GEOGRAPHIC REGIONS AND SOURCES AFFECTED

API's proposed amendments to Part 216 would impact petroleum and petrochemical processes because Section 216.361 only applies to such processes. To API's knowledge, this would only include the following four petroleum refineries:

- ExxonMobil Oil Corp. Joliet Refinery (ID No. 197800AAA) located at 25915 S. Frontage Road, Channahon, Illinois (Will County). This refinery has a capacity of >250,000 barrels per day and operates a single fluid catalytic cracker;
- WRB Refining LP Wood River Refinery (ID No. 119090AAA) located at 900 South Central Avenue, Roxana, Illinois (Madison County). This refinery has a capacity of >350,000 barrels per day and operates two fluid catalytic crackers;
- CITGO Petroleum Corp. Lemont Refinery (ID No. 197090AAI) located at 135th Street and New Avenue, Lemont, Illinois (Will County). This refinery has a capacity of >179,000 barrels per day and operates a single fluid catalytic cracker; and
- Marathon Petroleum Co. Robinson Refinery (ID No. 033808AAB) located at 100 Marathon Avenue, Robinson, Illinois (Crawford County). This refinery has a capacity of >250,000 barrels per day and operates a single fluid catalytic cracker.

ExxonMobil, Phillips 66 (WRB), and Marathon are members of API. All four refineries support API's proposed amendments to Part 216.

Furthermore, three of the four petroleum refineries listed above are not located in environmental justice ("EJ") areas, as defined by Illinois' EJ Start Mapping Tool.[14] The 2015 SIP Rulemaking stated that the "human health or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income or indigenous populations." 80 Fed. Reg. 33,985 (June 12, 2015).

[14] https://illinois-epa.maps.arcgis.com/apps/webappviewer/index.html

Additionally, USEPA's 2015 SIP Call considered AELs as SIP-strengthening. Adopting API's proposed AEL would not adversely impact EJ communities.

VII. TECHNICAL FEASIBILITY AND ECONOMIC REASONABLENESS

The AEL proposed herein are from NESHAP Subpart UUU. NESHAP Subpart UUU contains limits and standards based on MACT. The alternative emission limitations and standards proposed herein were promulgated by USEPA in December 2015. 80 Fed. Reg. 75178 (Dec. 1, 2015). In that rulemaking, USEPA found that the alternative standard that applies during periods of SSM was technically feasible, as referenced above. Specifically, USEPA found the oxygen concentration limit to be appropriate because "air blast rates can be directly controlled to ensure adequate oxygen supply on a short-term basis." 79 Fed. Reg. 36880, 36943 (June 30, 2014). As to the Illinois refineries, it is API's understanding that each of the four refineries already utilize the alternate standards incorporated in API's proposed amendments and do not have any issues with maintaining compliance with those alternate standards. Technical feasibility is further addressed in the Technical Support Document attached as Exhibit 1 hereto.

As for economic reasonableness, USEPA found the rules adopted in the December 2015 action to be economically justified. Per USEPA, the total capital investment cost of the final amendments and standards was estimated at $283 million. 80 Fed. Reg. 75178, 75225 (Dec. 1, 2015). USEPA also estimated that all petroleum product refiners would incur annual compliance costs of less than 1% of their sales. *Id*. at 75226. As for the economic impact on Illinois sources, the four refineries in Illinois are already subject to NESHAP Subpart UUU and, to API's knowledge, utilize the alternate emission standards referenced in API's proposed amendments. Therefore, API's proposed amendment to Section 216.361 should not have any additional economic impact.

VIII. OUTREACH

API has discussed its proposal with the four refineries impacted by this Proposal. All four refineries are supportive of API's Proposal.

During Illinois EPA's pre-filing comment period for its proposal to remove the SMB provisions, at least one API refinery member contacted Illinois EPA in an attempt to open a dialogue regarding the potential for a FCCU AEL. During those discussions, the refinery representative walked through USEPA's seven AEL criteria as they related to the FCCU AEL proposal.

In March and April, 2023, API attempted to schedule a meeting with USEPA and Illinois EPA to discuss the FCCU AEL proposal. On April 5, 2023, API met with USEPA Region 5 representatives to discuss the need for an FCCU AEL addressing CO emissions during startup and hot standby. In that meeting, USEPA Region 5 committed to working with API and Illinois EPA to address API's concerns.

On April 28, 2023, USEPA Region 5 requested that API schedule a meeting between USEPA Region 5, API, and Illinois EPA to discuss the FCCU AEL proposal. On May 1, 2023, API communicated that request to Illinois EPA. On May 5, 2023, Illinois EPA responded to that request, stating that Illinois EPA was focusing its attention and efforts on pursuing the removal of the SMB provisions in PCB R 23-18. Illinois EPA stated that, once those underlying rule changes were obtained, Illinois EPA would then be ready to direct its attention to further discussions with API and other stakeholders.

On June 21, 2023, API and other industrial stakeholders met virtually with representatives from Illinois EPA, USEPA, and JCAR to discuss proposing AELs. On June 28,

2023, API met virtually with Illinois EPA to discuss API's FCCU proposal. This Proposal addresses points raised by Illinois EPA during those discussions.

IX. SIGNATURE REQUIREMENT

Section 28(a) of the Act and Section 102.202(g) of the Board's procedural regulations requires that a rulemaking of general applicability include a petition signed by at least 200 persons. 415 ILCS 5/28(a); 35 Ill. Adm. Code 102.202(g). In the Board's July 6, 2023 Order in this sub-docket, the Board waived the 200-person signature requirement. Board Order, PCB R 23-18(A), slip op. at 4 (July 6, 2023).

X. HEARING

In the Board's July 6, 2023 Order in this sub-docket, the Board stated that "each rulemaking proposal for alternative standards during SSM must include a statement of whether the proponent requests that one or more public hearings be held on its proposal, along with a statement addressing whether the Act requires one or more hearings to be held on the proposal, including whether any hearing already held in the main docket would satisfy all or part of that requirement, as well as public notice requirements under the Act and the Clean Air Act." Board Order, PCB R 23-18(a), slip. op. at 4-5 (July 6, 2023). In this section, API addresses those requirements.

A. No Request for Hearing

API does not request a hearing on its proposal in this sub-docket. As explained below, the hearing and public notice requirements as to API's proposal have already been satisfied and an additional hearing(s) or public notice is not required.

B. Hearing Requirement

Pursuant to Section 28(a) of the Act, "[n]o substantive regulation shall be adopted, amended, or repealed until after a public hearing within the area of the State concerned. In the case of state-wide regulations hearings shall be held in at least two areas." 415 ILCS 5/28(a). Because API's proposal is a rulemaking proposal of general applicability, a public hearing is required and the hearings must be held in at least two areas because it is a proposal of state-wide applicability.

However, the hearings held in PCB R 23-18 satisfy this requirement as to API's proposal. After Illinois EPA filed its proposal in the main rulemaking on December 7, 2022, the Board scheduled three hearings pursuant to the Fast Track regulations. Per the December 16, 2022 Hearing Officer Order, the first hearing "shall be confined to testimony by and questions of the Agency's witnesses concerning the scope, applicability, and basis of the rule." Hearing Officer Order, PCB R 23-18, slip. op. at 1 (Dec. 16, 2023). The first hearing took place on January 19, 2023 in Springfield. Illinois EPA's witness was questioned by several industrial stakeholders, including IERG and Dynegy, and the Illinois Attorney General's Office. The majority of IERG's and Dynegy's questions concerned proposing AELs. *See, e.g.,* First Hearing Transcript, PCB R 23-18, 25:18-21; 26:1-3 and 19-21, 35:11-13 and 19-23, 44:7-15, 45:14-19, 47:7-9, 48:3-7, 52:15-20, 59:6-13, 60:11-14, 63:19-22, 77:8-13, 79:7-13, 89:19-22, 94: 8-11 (Jan. 19, 2023.

Per the December 16, 2022 Hearing Officer Order, the second hearing "shall be devoted to presentation of testimony, documents, and comments by affected entities and all other interested parties." *Id*. Hearing Officer Order, PCB R 23-18, slip. op. at 1 (Dec. 16, 2023). The second hearing was held on February 16, 2023 in Chicago.

In IERG's Pre-filed Testimony, filed on February 6, 2023 and submitted for the second hearing, IERG set forth complete proposals to amend several sections of Part 216. IERG's Pre-

filed Testimony first set forth its fuel combustion emission source AEL proposal and then set forth its FCCU proposal. Pre-Filed Testimony of Kelly Thompson and David Wall, PCB R 23-18, 23-60 (Feb. 6, 2023). On February 6, 2023, API filed testimony in support of IERG's FCCU AEL proposal. Pre-Filed Testimony of John Derek Reese, PCB R 23-18 (Feb. 6, 2023). IERG's FCCU AEL proposal, in conjunction with API's testimony in support, satisfied all substantive requirements for a general rulemaking. IERG's Pre-filed Testimony in PCB R 23-18, while not styled as "Statement of Reasons" and "Technical Support Document,"[15] included all of the substantive information required for a rulemaking proposal. This included background information on the proposed rule, proposed amendment language and explanations of such amendments, discussions on effect of the proposal, discussions on regulatory, technical, and economic justifications for the proposed rule, and discussions on outreach conduction and sources affected. In this sub-docket, API is proposing the FCCU AEL proposal and not IERG. However, the amended regulatory language proposed herein is unchanged from IERG's filing in PCB R 23-18, with the exception of API removing the incorporated provisions concerning shutdown. With this change, API's proposed AEL is more tailored and narrowly focused. Additionally, the information provided herein in justification of the Proposal is the same as the information provided by IERG and API in PCB R 23-18, with the addition of additional support to supplement the justification for the Proposal.

Therefore, a complete FCCU AEL proposal was filed for consideration during the second hearing in PCB R 23-18. At the second hearing, IERG and API presented its witnesses in support of the FCCU AEL proposal. The Board and Illinois Attorney General's Office asked questions for IERG's and API's witnesses during the hearing, including questions specifically

[15] During the February 3, 2023 pre-hearing conference, the Hearing Officer instructed participants that any proposal must be included in the Pre-filed Testimony.

concerning the FCCU proposal. *See, e.g.,* Second Hearing Transcript, PCB R 23-18, 33:3-24, 34:1-24, 35:1-13, 37:15-24, 38:1-24, 39:1-24, 40:1-24, 41:1-16, 49:5-24 (Feb. 16, 2023). Any other participant was afforded the opportunity to ask questions during the second hearing concerning the FCCU AEL proposal.

Lastly, per the December 16, 2022 Hearing Officer Order, the third hearing, if necessary, "shall be devoted solely to any Agency response to the material submitted at the second hearing and to any responses by other parties. The third hearing shall be cancelled if the Agency indicates to the Board that it does not intend to introduce any additional material." Hearing Officer Order, PCB R 23-18, slip. op. at 2 (Dec. 16, 2023). During the second hearing, Illinois EPA indicated to the Board that it did not intend to introduce any additional material and requested that the third hearing be cancelled, and the Board cancelled the third hearing. Second Hearing Transcript, PCB R 23-18, 73:23-24, 74:1-14 (Feb. 16, 2023); Hearing Officer Order, PCB R 23-18, at 1 (Feb. 21, 2023).

The hearings held in PCB R 23-18 satisfy the hearing requirements for API's Proposal. Hearings were held in two areas of the State and participants were afforded the opportunity to question the FCCU AEL proposal at hearing. Therefore, a hearing is not required in this sub-docket on API's Proposal.

C. Public Notice

Similar to the above arguments, the public notice and comment requirements have been satisfied as to API's Proposal. Illinois EPA's proposal to remove the SMB provisions in PCB R 23-18 was published in the Illinois Register at First Notice and Second Notice. The public hearings held in PCB R 23-18 were sufficiently noticed. The Board entered a Notice of Hearing on December 16, 2022 which provided information concerning the location and time of hearings,

what information would be the subject of the hearings, established deadlines for pre-filed testimony, and included information on submitting public comments. Notice of Hearing, PCB R 23-18 at 1-4 (Dec. 16, 2022). Sufficient notice and opportunity to comment was provided to the public in PCB R 23-18.

D. Synopsis of Testimony

Section 102.202 of the Board's procedural regulations requires that a proposal for regulations of general applicability include a synopsis of all testimony to be presented by the proponent at hearing. 35 Ill. Adm. Code 102.202(c). As explained above, it is API's position that the hearing requirements have been satisfied via the hearings conducted in PCB R 23-18. However, if the Board disagrees with this position and is inclined to hold a hearing on API's proposal, then API anticipates calling John Derek Reese, the Downstream Policy Advisor at API, as a witness at hearing. Mr. Reese would testify regarding the impact of the Board's removal of the SMB provisions on the four refineries, the need for an AEL including the technical infeasibility of complying with the CO standards in Section 216.361 during startup and hot standby, as well as the other components of this Proposal.

XI. STUDIES OR REPORTS

Pursuant to 35 Ill. Adm. Code 102.202(e), a proposal for rulemaking must include a descriptive title or other description of any published study or research report used in developing the rule, as well as other related information. API did not utilize or depend on any published studies or research reports in developing its Proposal.

XII. ELECTRONIC COPY

Pursuant to 35 Ill. Adm. Code 102.202(j), simultaneous with the filing of this Proposal, API is submitting an electronic version of the proposed rule language in Microsoft Word for Windows, version 6.0 or greater.

XII. CONCLUSION

For the foregoing reasons, API hereby submits this regulatory proposal and respectfully requests that the Board amend these regulations consistent with the proposal above.

Respectfully submitted,

AMERICAN PETROLEUM INSTITUTE,

Dated: August 7, 2023

By: /s/ Alec Messina
One of Its Attorneys

Alec Messina
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Alec.Messina@heplerbroom.com
(217) 528-3674

PROPOSED RULE LANGUAGE

PART 216

TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER I: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSION STANDARDS AND LIMITATIONS FOR STATIONARY SOURCES

PART 216
CARBON MONOXIDE EMISSIONS

SUBPART A: GENERAL PROVISIONS

Section

SUBPART B: FUEL COMBUSTION EMISSION SOURCES

Section

SUBPART C: INCINERATORS

Section

SUBPART N: PETROLEUM REFINING AND CHEMICAL MANUFACTURE

Section

SUBPART O: PRIMARY AND FABRICATED METAL PRODUCTS

Section

Appendix A Rule into Section Table
Appendix B Section into Rule Table
Appendix C Compliance Dates

AUTHORITY: Implementing Section 10 and authorized by Section 27 of the Environmental Protection Act (Ill. Rev. Stat. 1991, ch. 111 1/2, pars. 1010 and 1027).

SOURCE: Adopted as Chapter 2: Air Pollution, Rule 206: Carbon Monoxide Emissions, R71-23, 4 PCB 191, April 13, 1972, filed and effective April 14, 1972; amended at 3 Ill. Reg. 47, p. 92, effective November 8, 1979; amended at 4 Ill. Reg. 24, p. 514, effective June 4, 1980; codified at 7 Ill. Reg. 13607; amended in R87-18 at 12 Ill. Reg. 20774, effective December 6, 1988; amended in R90-23 at 16 Ill. Reg. 18075, effective November 13, 1992; amended in R 23-18(A) at Ill. Reg. , effective .

SUBPART A: GENERAL PROVISIONS

Section 216.103 Definitions

The definitions contained in 35 Ill. Adm. Code 201 and 211 apply to this Part. The definitions for "catalytic cracking unit" and "hot standby" in 40 CFR 63.1579 apply to Section 216.361(d) of this Part. The definition of "startup" in 40 CFR 63.2 applies to Section 216.361(d) of this Part.

(Source: Amended at Ill. Reg. , effective)

Section 216.104 Incorporations by Reference

The following materials are incorporated by reference: non-dispersive infrared method, 40 CFR 60, Appendix A, Method 10 (1982); 40 CFR Part 63, Subpart A (2022); 40 CFR Part 63, Subpart UUU (2022).

(Source: Amended at Ill. Reg. , effective)

SUBPART N: PETROLEUM REFINING AND CHEMICAL MANUFACTURE

Section 216.361 Petroleum and Petrochemical Processes

a) No person shall cause or allow the emission of a carbon monoxide waste gas stream into the atmosphere from a petroleum or petrochemical process unless such waste gas stream is burned in a direct flame afterburner or carbon monoxide boiler so that the resulting concentration of carbon monoxide in such waste gas stream is less than or equal to 200 ppm corrected to 50 percent excess air, or such

waste gas stream is controlled by other equivalent air pollution control equipment approved by the Agency according to the provisions of 35 Ill. Adm. Code 201.

b) Notwithstanding subsection (a), any existing petroleum or petrochemical process using catalyst regenerators of fluidized catalytic converters equipped for in situ combustion of carbon monoxide, may emit a carbon monoxide waste gas stream into the atmosphere if the carbon monoxide concentration of such waste gas stream is less than or equal to 750 ppm corrected to 50 percent excess air.

c) Notwithstanding subsection (a), any new petroleum or petrochemical process using catalyst regenerators of fluidized catalytic converters equipped for in situ combustion of carbon monoxide, may emit a carbon monoxide waste gas stream into the atmosphere if the carbon monoxide concentration of such waste gas stream is less than or equal to 350 ppm corrected to 50 percent excess air.

d) Notwithstanding subsections (a) through (c), during periods of startup and hot standby, any new or existing petroleum catalytic cracking units can elect to comply with subsections (a) through (c) or the alternate limitation for these operating modes in 40 CFR 63 Subpart UUU Tables 9, 10, 14, and 41 and 40 CFR 63.1565(a)(5), 40 CFR 63.1570(c) and (f), 40 CFR 63.1572(c) and 40 CFR 63.1576(a)(2) and (d).

(Source: Amended at Ill. Reg. , effective)

TECHNICAL SUPPORT DOCUMENT

PROPOSED RULE
PCB R 23-18(A)

TITLE: 35 ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER 1: POLLUTION CONTROL BOARD
SUBCHAPTER c: EMISSION STANDARDS AND LIMITATIONS FOR STATIONARY SOURCES

PART 216
CARBON MONOXIDE EMISSIONS

Prepared by the American Petroleum Institute

August 7, 2023

EXHIBIT 1

TABLE OF CONTENTS

I. Introduction

API opposed the Illinois Environmental Protection Agency's (IEPA or Agency) proposed amendments to Part 201 in PCB R 23-18, which were adopted by the Illinois Pollution Control Board on July 20, 2023. API opposed the amendments on 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 is now requesting, in PCB R 23-18(A), that the Board adopt rule specific AEL 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. This Technical Support Document (TSD) provides technical justification and support for API's proposal in PCB R 23-18(A).

In this TSD, API 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 AEL requirements. The Board need only to reference the appropriate 40 Code of Federal Regulations (CFR) Part 60 and Part 63 emission standards and work practices applicable during startup and hot standby as acceptable alternatives for the State carbon monoxide (CO) emission limitation requirement.

Additionally, this TSD will demonstrate the very real and adverse impacts on refinery operations for fluid catalytic cracking units (FCCUs) that the Board's recently adopted amendments to Part 201 will create. Further, this TSD will address 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 as 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 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. The Board's amendments to Part 201 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 the amendments to Part 201, including refineries subject to Part 63 Subpart UUU, and will be directly impacted by the amendments.

There are four refineries located in Illinois which will be impacted by the 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.

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

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)

In PCB R 23-18, IEPA proposed 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 proposed, and the Board adopted, amendments to Sections 201.261 through 201.265 and 201.149, which included removing the provisions that effectively established permit-based exemptions for periods of SMB. The Board did not replace these provisions with any other provision for operation during periods of SMB. IEPA argued and the Board agreed that the amendments were "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 asserted 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.

Contrary to IEPA's current view, the SMB regulations at issue 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. Further, Section 202.107 defined "allowable emissions" to "include a reasonable estimate of emissions in excess of applicable standards during start-up, malfunction, or breakdown, as appropriate, only if the applicable provisions of 35 Ill. Adm. Code Part 201 have been complied with." 35 Ill. Adm. Code 202.107(c). IEPA's proposal removed this subsection (c) in "allowable emission," but the original inclusion of this term in the regulation is evidence that emissions were "excused" during periods of SMB.

So, it is incorrect for IEPA to have asserted in PCB R 23-18 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 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), 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 USEPA'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 USEPA 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). 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, USEPA 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, the Board 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.

A recent illustration of this approach is the June 15, 2023, USEPA Region 10 proposed approval of the Washington SIP revisions with AELs where USEPA finds that emissions will not increase as a result of SIP revisions to incorporate new AELs "for two reasons: (1) Washington's revised rules require compliance with AELs during transient modes of operations, whereas the prior version of the rules (including the SIP-called version of WAC 173-400-107) allowed sources to routinely avoid penalties for excess emissions; and (2) the pre-existing emissions limits remain in place for non-transient modes of operation for these sources." 88 Fed. Red. 39210 at 39212.

Like Washington, Illinois' SMB regulations allowed petroleum refineries through prima facie provisions in their CAAPP permits, which provisions remain in permits today, to routinely avoid penalties for excess emissions during transient events. API's proposed likewise (1) requires compliance with AELs during transient modes of FCCU operation, including startup and hot standby (i.e., the same AELs that have been instituted for MACT UUU compliance), and (2) retains the pre-existing emission limits for non-transient modes of FCCU operation (i.e., 200 ppm).

Further, we understand that IEPA believes that USEPA's guidance, on replacing the automatic exemption with an appropriate alternative emission limitation, may not be applicable here because the IEPA has taken the position that the prior SMB provisions established an affirmative defense and did 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 stated 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 had 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 prior SMB provisions allowed "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 prior 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 prior 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.

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 adopt such rule-specific alternative standards in Section 216.361 as proposed by API.

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 USEPA standards and regulations. Their performance is reported to the USEPA 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 when compared to other states by prescribing a specific CO emission limitation of 200 ppm. 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 (SCAQD) 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, as explained below, 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.

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

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

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.

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 a 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 Regulations

What does it mean if the Board does not adopt API's proposed AEL? 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.

Further, hot standby is a mode of source operation other than startup and shutdown which is implemented in response to a malfunction or breakdown situation. USEPA recognized hot standby as another mode of source operation by including provisions applicable during hot standby periods in NESHAP Subpart UUU. Even though the prior SMB provisions in 35 Ill. Adm. Code Part 201 did not address standby, it is an important backup in response to a malfunction or breakdown situation. Hot standby can be used when there is a unit upset that takes another unit down and the FCCU can be paused without having to shut the unit completely down. Hot standby avoids a subsequent cold start, which can have higher CO emissions and has more associated process safety risks.[3]

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, 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 the Board to address the CO concern 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-

[3] The Code of Federal Regulations defines "hot standby" as "periods when the catalytic cracking unit is not receiving fresh or recycled feed oil but the catalytic cracking unit is maintained at elevated temperatures, typically using torch oil in the catalyst regenerator and recirculating catalyst, to prevent a complete shutdown and cold restart of the catalytic cracking unit." 40 CFR 63.1579.

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 USEPA 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.

Additionally, the startup sequence for FCCUs is a delicate sequence of events and steps as the reactor and regenerator are brought online and raised to the appropriate operating temperature prior to the introduction of hydrocarbon into the reactor. This startup sequence can cause issues in regard to worker safety. In the process of reaching full burn mode operation for FCCUs, there is a relatively short period of time during startup when the unit operates in partial burn mode which subsequently can cause an inherently unstable unit. An unstable unit could lead to an explosion of the unit which then would the harm the surrounding workers. An example of an explosion at a refinery was the Huskey Energy Superior Refinery Explosion and Fire that occurred in Superior, Wisconsin on April 26, 2018. The refinery was shutting down in preparation for a five-week turnaround when an explosion occurred, sending several people to area hospitals with injuries.[4]

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

[4] More information and the final report are publicly available at: https://www.csb.gov/husky-energy-superior-refinery-explosion-and-fire/.

adopt the amendment to Section 216.361 proposed by API. The solution is simple, successfully implemented since 2016, and specifically reviewed and approved by USEPA as correct for FCCU SSM scenarios.