



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

JUN 30 2014

REPLY TO THE ATTENTION OF:

**CERTIFIED MAIL**  
**RETURN RECEIPT REQUESTED**

Mike Stoneberger  
Environmental Manager  
LyondellBasell  
Equistar Chemicals, LP  
625 E. U.S. Highway 36  
Tuscola, IL 61953

Dear Mr. Stoneberger:

The U.S. Environmental Protection Agency has determined that LyondellBasell's (Lyondell's) facility at 625 E. U.S. Highway 36, Tuscola, Illinois is in violation of the Clean Air Act (the Act) and associated state or local pollution control requirements. A list of the requirements violated is provided below. We are today issuing to you a Finding of Violation (FOV) for these violations.

EPA finds that Lyondell has violated the General Provisions to the New Source Performance Standards (NSPS) and the NSPS for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations.

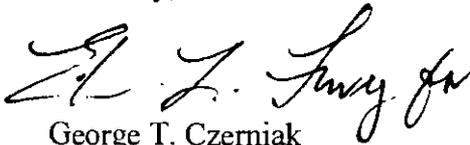
Section 113 of the Act gives us several enforcement options. These options include issuing an administrative compliance order, issuing an administrative penalty order, and bringing a judicial civil or criminal action.

We are offering you the opportunity to confer with us about the violations alleged in the FOV. The conference will give you an opportunity to present information on the specific findings of violation, any efforts you have taken to comply and the steps you will take to prevent future violations. In addition, in order to make the conference more productive, we encourage you to submit to us information responsive to the FOV prior to the conference date.

Please plan for your facility's technical and management personnel to attend the conference to discuss compliance measures and commitments. You may have an attorney represent you at this conference.

The EPA contacts in this matter are Virginia Galinsky, Environmental Engineer, and Susan Prout, Associate Regional Counsel. You may call them at (312) 353-2089 and (312) 353-1029, respectively, if you wish to request a conference. You should make the request for a conference within 10 calendar days following receipt of this letter. We should hold any conference within 30 calendar days following receipt of this letter. EPA hopes that this FOV will encourage Lyondell's compliance with the requirements of the Act.

Sincerely,

A handwritten signature in black ink, appearing to read "G. T. Czerniak". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

George T. Czerniak  
Director  
Air and Radiation Division

cc: Eric Jones, Manager  
Compliance Unit  
Illinois Environmental Protection Agency

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 5**

**IN THE MATTER OF:**

**LyondellBasell  
Tuscola, Illinois**

Proceedings Pursuant to  
the Clean Air Act  
42 U.S.C. § 7401 *et seq.*

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**FINDING OF VIOLATION**

**EPA-5-14-IL-43**

**FINDING OF VIOLATION**

LyondellBasell (you or Lyondell) owns and operates a chemical manufacturing facility at 625 E. U.S. Highway 36, Tuscola, Illinois (facility). Operations at the facility include an alcohol plant and a molecular sieve dehydration unit. Air emission control equipment for these operations includes two flares, known as the East Flare and the West Flare.

The U.S. Environmental Protection Agency is sending this Finding of Violation (FOV) because you have failed to operate your flares in accordance with good engineering control practices for minimizing emissions, in violation of the General Provisions to the New Source Performance Standards (NSPS). Additionally, you failed to conduct a performance test at the maximum production rate, in violation of the NSPS for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations (NSPS Subpart NNN).

**NSPS Subpart A**

1. Section 111(b) of the CAA, 42 U.S.C. § 7411(b) requires EPA to publish a list of categories of stationary sources and, within a year after the inclusion of a category of stationary sources in the list, to publish proposed regulations establishing Federal standards of performance for new sources within the source category.

2. On October 15, 1973, EPA promulgated the General Provisions for the Part 60 NSPS standards at 40 C.F.R. Part 60, Subpart A, §§ 60.1 - 60.19. 38 FR 28565; the provisions have been subsequently amended.

3. 40 C.F.R. § 60.1(a) provides that, “[e]xcept as provided in subparts B and C, the provisions of this part apply to the owner or operator of any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard (or, if earlier, the date of publication of any proposed standard) applicable to that facility.”

4. 40 C.F.R. § 60.2 defines an “affected facility” under the NSPS, with reference to a stationary source, as any apparatus to which a standard is applicable.

5. 40 C.F.R. § 60.11(d) requires that “at all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.”

#### **NSPS Subpart Kb**

6. EPA proposed Standards of Performance for Volatile Organic Liquid (VOL) Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction or Modification Commenced after July 23, 1984 (NSPS Subpart Kb) on July 23, 1984. *See* 49 Fed. Reg. 29698. EPA promulgated NSPS Subpart Kb on April 8, 1987. *See* 52 Fed. Reg. 11420. NSPS Subpart Kb has been subsequently amended. The subpart is codified at 40 C.F.R. §§ 60.110b – 60.117b.

#### **NSPS Subpart NNN**

7. EPA proposed Standards of Performance for Volatile Organic Compound (VOC) Emissions From Synthetic Organic Chemical Manufacturing Industry (SOCMI) Distillation Operations (NSPS Subpart NNN) on December 30, 1983. *See* 48 Fed. Reg. 57538. EPA promulgated NSPS Subpart NNN on June 29, 1990. *See* 55 Fed. Reg. 26931. NSPS Subpart NNN has been subsequently amended. The subpart is codified at 40 C.F.R. §§ 60.660 – 60.668.

8. 40 C.F.R. § 60.660(b) identifies the affected facility covered by NSPS Subpart NNN, which includes any distillation unit that produces ethanol, along with its associated vent gas recovery system, for which construction, modification, or reconstruction commenced after December 30, 1983.

9. 40 C.F.R. § 60.660(c)(6) provides that “[e]ach affected facility operated with a vent stream flow rate less than 0.008 [standard cubic meters per minute (scm/min)] is exempt from all provisions of this subpart except for the test method and procedure and the recordkeeping and reporting requirements in §60.664(g) and paragraphs (i), (l)(5), and (o) of §60.665.”

10. 40 C.F.R. § 60.664(a) provides that “[f]or the purpose of demonstrating compliance with §60.662, all affected facilities shall be run at full operating conditions and flow rates during any performance test.”

11. 40 C.F.R. § 60.665(o) provides that, “[e]ach owner or operator that seeks to demonstrate compliance with §60.660(c)(6) must submit to the Administrator an initial report including a flow rate measurement using the test methods specified in §60.664.”

## **Title V**

12. Section 502(a) of the Act, 42 U.S.C. § 7661a(a), and 40 C.F.R. § 70.7(b) provide that, after the effective date of any permit program approved or promulgated under Title V of the Act, no source subject to Title V may operate except in compliance with a Title V permit.

13. 40 C.F.R. § 70.7(b) states "...no part 70 source may operate after the time that it is required to submit a timely and complete application under an approved permit program, except in compliance with a permit issued under a part 70 program."

14. 40 CFR § 52.23 states "[f]ailure to comply with...any approved regulatory provision of a State implementation plan, or with any permit condition or permit denial issued pursuant to approved or promulgated regulations for the review of new or modified stationary or indirect sources, or with any permit limitation or condition contained within an operating permit issued under an EPA-approved program that is incorporated into the State implementation plan, shall render the person or governmental entity so failing to comply in violation of a requirement of an applicable implementation plan and subject to enforcement action under section 113 of the Clean Air Act."

15. EPA gave final interim approval of the Illinois Title V Permit program, effective March 7, 1995. 60 Fed. Reg. 12478 (March 7, 1995). EPA fully approved the Illinois Title V Permit program, effective November 30, 2001. 66 Fed. Reg. 62946 (December 4, 2001). Illinois' Title V Permit program requirements are codified at IAC Title 35, Part 270.

16. The Illinois Environmental Protection Agency (Illinois EPA) issued Title V Permit number 96020121 to the facility on April 21, 2008.

17. Section 7.1.3.j of the Title V Permit provides that "[t]he ether surge drum, Dr-1277, a storage tank, within the alcohol plant, is subject to 40 CFR 60 Subpart Kb."

## **Factual Background**

18. Lyondell owns and operates a chemical manufacturing facility at 625 East U.S. Highway 36, Tuscola, Illinois. The facility includes, among other control equipment, two flares, known as the East Flare and the West Flare, which control emissions from the Alcohol Plant at the Tuscola facility. The flares are normally operated as separate devices, however, gases from the East Flare can be routed to the West Flare. The facility also includes a molecular sieve dehydration unit (MSDU), which includes a distillation column that produces ethanol. The MSDU was constructed in 1998.

19. The MSDU is subject to NSPS Subpart NNN. Since January 2009, the highest monthly average feed rate at distillation column was 85.2 gallons per minute. For 22 months from January 2009 through July 2013, or 40% of the time, Lyondell has operated its distillation column at a monthly average feed rate greater than 63 gallons per minute.

20. On April 2, 2003, the facility conducted a performance test demonstrating that the vent stream flow rate was less than 0.008 scm/min. During this test, the distillation column was operating at a feed rate of approximately 63 gallons per minute, which is less than the maximum production rate demonstrated during recent historical operations. Thus, this performance test was not conducted at the maximum production rate as required by 40 C.F.R. §§ 60.664(a) and 60.665(o).

21. The East Flare is equipped with upper steam injection.

22. The ether surge drum storage tank (Dr-1277) is subject to NSPS Subpart Kb. The East Flare is used as the control device for the ether surge drum storage tank pursuant to NSPS Subpart Kb. Therefore, the East Flare is subject to the requirements of NSPS Subparts A and Kb.

23. In July 1983, EPA released report EPA 600/2-83-052, titled Flare Efficiency Study (1983 Flare Study). This study, partially funded by EPA and the Chemical Manufacturers Association (CMA), included various tests to determine the combustion efficiency and hydrocarbon destruction efficiency of flares under a variety of operating conditions. Certain tests were conducted on a steam-assisted flare provided by John Zink Company. The tests performed included a wide range of steam flows and steam-to-vent gas ratios. The data collected showed decreasing combustion efficiencies when the steam-to-vent gas ratio was above 3.5. The tests showed the following efficiencies at the following steam-to-vent gas ratios:

Pounds of Steam to One Pound of Vent Gas	Combustion Efficiency (%)
3.45	99.7
5.67	82.18
6.86	68.95

The report concluded that excessive steam-to-vent gas ratios caused steam quenching of the flame during the tests which resulted in lower combustion efficiency.

24. For vent gases that normally burn with a yellow-orange flame, the presence of a transparent flame indicates low combustion efficiency and excess emission to the environment.

25. On August 16, 2013, EPA issued a Section 114 Information Request to Lyondell. The request covered the two flares at the facility, and asked for information about the design and operating procedures for the flares, the vent gas flow and steam flow rates to the flares, the composition of vent gas going to the flares, the regulations that apply to the flares, and several construction permits issued to the facility.

26. Lyondell submitted responses to the Information Request on September 20, 2013, and October 30, 2013.

27. In its responses to the Information Request, Lyondell has reported that it does not have monitoring equipment to measure the flow rate or composition of vent gas or steam going

to either flare. It has also asserted that the steam control valves are not subject to regular preventative maintenance and are not in good condition.

28. The response included, among other items: (1) the Installation, Operation and Maintenance Manual for the East Flare, as provided by the manufacturer, Zeeco; (2) Document 2.27.6.1, Lyondell's manual for normal operation of the East and West Flares; (3) Document 2.27; and (4) Document 2.27.6.6, "Procedure To De-pressure DR-507 or DR-508 (Alcohol oil tanks) To the East Flare."

29. The Installation, Operation and Maintenance Manual for the East Flare, as provided by Zeeco, states at 5.1.1 that "[a] yellow or orange flame is preferred to a clear flame. A clear or blue flame will typically indicate too much steam is being applied. In addition, the operator should ensure the flame is visible at the top of the flare tip."

30. Document 2.27.6.1 includes instructions for the Inside Finishing Operator, the Outside Finishing Operator and the Inside Synthesis Operator to check various indicators and perform certain tasks. In Paragraph 29, Lyondell instructed its operators to operate the flare in a manner that contradicts the instruction from the manufacturer on how to properly operate the flare, including knowingly operating with a low heating value and with a transparent flame. These instructions lead to low combustion efficiency and excess emissions.

31. Document 2.27.6.1 includes a section titled, "Procedure To Depressure DR-507 Or DR-508 (Alcohol oil tanks) To The East Flare." This procedure overlaps with Document 2.7.6.6 but is not exactly the same:

- a. Both start with an overall description of the procedure, which states that "when DR-507 or DR-508 are being de-pressured to the flare tip, 99% of the gas going to the flare will be nitrogen at 25+ psig. Initially when de-pressuring these vessels to the flare tip, the nitrogen pushes all the residual ethylene out of the flare header at a high rate... After all the ethylene in the header is replaced with nitrogen, the flame becomes transparent and/or the flame on the flare may go out..." This procedure contradicts the instruction from Zeeco to have a visible flame.
- b. Documents 2.27.6.1 and 2.27.6.6 state that "...As long as the pilots are lit (field verify), everything should be okay with the flare tip." These procedures contradict the instruction from Zeeco to have a visible flame.
- c. Item 4 of Document 2.27.6.1 states that (emphasis added) "[a]fter a few minutes, the flame on the flare should taper off and will be replaced with nitrogen gas. The **flame should start to become transparent.**" Item 5 continues (emphasis added), "[r]educe steam flow on the flare tip to 10% valve opening **once the flame is transparent.** This procedure contradicts the instruction from Zeeco to maintain a visible flame. Document 2.27.6. instead instructs the operator to add fuel gas to the east flare from D-1180 in step 3, before venting DR-507 or DR-508 to the east flare.

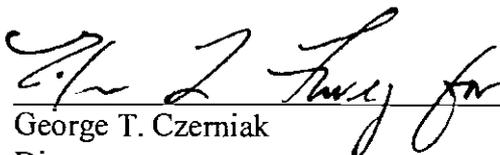
32. Nitrogen has a net heating value of 0. In a vent gas stream consisting of nitrogen and ethylene, the net heating value of the vent gas would be below 300 Btu/scf when the proportion of ethylene in the vent gas drops below 19% (i.e. greater than 81% nitrogen).

**Violations**

33. Because the 2003 performance test was not conducted at the maximum production rate of the distillation column, Lyondell has not conducted a valid performance test to demonstrate that it meets the exemption outlined at 40 C.F.R. § 60.660(c)(6), in violation 40 C.F.R. §§ 60.664(a) and 60.665(o).

34. By instructing its operators to let the flame become transparent before reducing the steam flow to the flare tip, and instructing its operators to use vent gas that is comprised of up to 99% nitrogen, Lyondell has instructed its operators to operate the flare in a manner that contradicts the instruction from the manufacturer on how to properly operate the flare and has failed to operate the East flare in a manner consistent with good engineering practices to minimize emissions, in violation of 40 C.F.R. § 60.11(d).

6/30/14  
Date

  
George T. Czerniak  
Director  
Air and Radiation Division

**CERTIFICATE OF MAILING**

I, Loretta Shaffer, certify that I sent a Finding of Violation, No. EPA-5-14-IL-43, by Certified Mail, Return Receipt Requested, to:

Robert Steele  
Environmental Manager  
LyondellBasell  
Equistar Chemicals, LP  
8805 North Tabler Road  
Morris, Illinois 60450

I also certify that I sent copies of the Violation and Finding of Violation by first-class mail to:

Ray Pilapil, Section Manager  
Compliance and Systems Management Section  
Illinois Environmental Protection Agency  
P.O. Box 19506  
Springfield, Illinois 62794-9506

On the 2 day of July 2014.

CERTIFIED MAIL RECEIPT NUMBER

Loretta Shaffer

7001 0320 0006 0185 9938

Loretta Shaffer, Administrative Program Assistant  
Planning and Administration Section