

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

In the Matter of:	)	
	)	
Middletown Coke Company	)	NOTICE OF
Middletown, Ohio	)	VIOLATION
	)	
Proceedings Pursuant to	)	EPA-5-24-OH-07
Section 113(a)(1) of the Clean	)	
Air Act, 42 U.S.C. § 7413(a)(1)	)	

NOTICE OF VIOLATION

The U.S. Environmental Protection Agency is issuing this Notice of Violation under Section 113(a)(1) of the Clean Air Act (CAA), 42 U.S.C. § 7413(a)(1). EPA finds that Middletown Coke Company LP (MCC) has violated the Ohio State Implementation Plan (SIP) and its federally enforceable Title V permit as follows:

Statutory and Regulatory Authority

Ohio SIP

1. Section 110 of the CAA, 42 U.S.C. § 7410, requires each state to adopt and submit to EPA a plan that provides for implementation, maintenance, and enforcement of primary and secondary National Ambient Air Quality Standards in the state.
2. On October 1, 1982, EPA approved revisions to Ohio's rules establishing general provisions for the control of air pollution, Rules 01 through 06, 08, and 09 at Ohio Administrative Code (OAC) Chapter 3745-15, as part of the federally enforceable SIP. 47 Fed. Reg. 43375.
3. OAC Rule 3745-15-06(A)(2) provides that, except as otherwise indicated by the rule, scheduled maintenance of air pollution control equipment that requires shutting down or bypassing the equipment shall be accompanied by the shutdown of the associated sources.
4. OAC Rule 3745-15-06(A)(3) provides, in part, that in cases where a complete source shutdown for the scheduled maintenance of air pollution control equipment may result in damage to the source or is otherwise impossible, impractical, or unsafe, the owner or operator may request authorization to continue operating the source during the scheduled maintenance of air pollution control equipment. Any such request shall be made in a written report at least two weeks prior to the planned shutdown of the air pollution control equipment. The Director of the Ohio Environmental Protection Agency (OEPA) shall authorize the continued operation of the source despite shutdown of the air pollution control equipment if, in the Director's judgment, the situation justifies continued operation of the source.

5. On January 22, 2003, EPA approved Ohio's Permit-to-Install (PTI) rules, OAC Chapter 3745-31, as part of the federally enforceable SIP. 68 Fed. Reg. 2909.

6. OAC Rule 3745-31-02(A)(1)(a) provides that no person shall cause, permit, or allow the installation or modification of any new source that is, or will be, part of a facility, as defined in OAC Chapter 3745-77, and that is required to obtain a Title V permit under OAC Chapter 3745-77, without first obtaining a PTI from the Director of OEPA.

7. OAC Rule 3745-31-05(A) provides, in part, that the Director of OEPA shall issue a PTI on the basis of the information appearing in the application, or information gathered by or furnished to OEPA, or both, if the Director determines that the installation, modification, or operation of the air contaminant source will (1) not prevent or interfere with the attainment or maintenance of applicable ambient air quality standards, (2) not result in a violation of any applicable laws, and (3) employ best available technology, when applicable.

8. Section 113(a)(1) of the CAA, 42 U.S.C. § 7413(a)(1), provides, in part, that whenever the Administrator of EPA finds that any person has violated or is in violation of any requirement or prohibition of an applicable SIP or permit, the Administrator shall notify the person and the State in which the plan applies of such finding.

Title V Permit Program

9. Title V of the CAA, 42 U.S.C. §§ 7661–7661f, and its implementing regulations at 40 C.F.R. Part 70, establish an operating permit program for certain major sources of air pollutants. The purpose of Title V is to ensure that all applicable requirements for compliance with the CAA are included in the Title V operating permit for the source.

10. Pursuant to Section 502(a) of the CAA, 42 U.S.C. § 7661a(a), it is unlawful for any person to, among other things, operate a major source subject to Title V except in compliance with a Title V permit after the effective date of any permit program approved or promulgated under Title V of the CAA.

11. On July 21, 1992, EPA promulgated regulations for State Operating Permit Programs at 40 C.F.R. Part 70. 57 Fed. Reg. 32250.

12. 40 C.F.R. § 70.7(b) provides that, except as otherwise indicated by the rule, the owner or operator of a Title V source shall not operate such source after the date that a timely and complete Title V permit application is required to be submitted, except in compliance with a permit issued under Part 70.

Statement of Facts

MCC Coke Battery

13. MCC owns and operates a coke oven battery at its facility in Middletown, Ohio (Facility) that consists of a group of ovens connected by common walls and operated as a unit, where coal undergoes destructive distillation to produce coke. The coke oven battery is classified as non-recovery

because it is designed for the combustion of the coke oven gas from which gas by-products are not recovered.

14. After the coke oven gas is combusted, the gas is routed to five parallel heat recovery steam generators (HRSGs), numbered #1 through #5.

15. The HRSGs cool the coke oven gas by transferring heat to water and steam that flows through metal tubes within each HRSG. MCC uses the superheated steam produced by the HRSGs for electricity generation.

16. A HRSG bypass stack that discharges to the atmosphere is located prior to each HRSG for use during HRSG maintenance or to safely vent gasses under an emergency situation. Under normal operation, the HRSG bypass stacks are closed such that no gas is vented.

17. The cooled coke oven gas from the HRSGs is controlled by a spray dryer/fabric filter system and a hydrated activated carbon (HAC) injection system, then vented to atmosphere through the main stack.

Title V Permit and Coke Battery PTI

18. OEPA issued Title V Permit Number P0111630 to MCC on May 20, 2015 (2015 Title V Permit), with an effective date of June 10, 2015, that includes requirements for the heat recovery coke battery at the Facility.

19. OEPA issued PTI Number P0121379 to MCC on September 21, 2016 (2016 PTI), effective upon issue, that provides an administrative modification to the PTI for the heat recovery coke battery at the Facility.

20. Both the 2015 Title V Permit and 2016 PTI identify the heat recovery coke battery at the Facility as Emissions Unit (EU) P901.

21. Conditions A.3 of the 2015 Title V Permit and A.5 of the 2016 PTI both provide, in part, that any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC Rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emission unit(s) that is (are) served by such control system(s).

22. Conditions C.6(c)(1) of the 2015 Title V Permit and C.1(c)(1) of the 2016 PTI both provide that emissions from P901 shall be vented to the waste gas exhaust baghouse at all times the emissions unit is in operation, except during bypassing of the lime spray dryer and HRSGs as allowed in the permit.

23. Conditions C.6(c)(7) of the 2015 Title V Permit and C.1(c)(7) of the 2016 PTI both provide, in part, that combustion gases from the coking process shall be routed to the HRSGs controlled by the spray dryer/fabric filter system, except (1) during inspection and maintenance of HRSGs; (2) during inspection and maintenance of the spray dryer/fabric filter system, the combustion gases will be routed directly to the main stack after passing through the HRSGs; and (3) monthly

verification of operability of the lids for the HRSG bypass stacks. The total duration of bypass venting due to HRSG maintenance shall not exceed 960 stack-hours per 12-month rolling period (excluding time when HRSG maintenance is performed during lime spray dryer maintenance).

24. Emission controls for PM_{2.5}, SO₂, H₂SO₄, and PE/PM₁₀ specified at both Condition C.6(b)(2) of the 2015 Title V Permit and Condition C.1(b)(2) of the 2016 PTI include, among other things:

- a. Limiting HRSG maintenance to one HRSG at a time, except during the annual shut down of the spray dryer/fabric filter system when MCC is permitted to perform preventive maintenance on up to two HRSGs during the same maintenance period as for the spray dryer/fabric filter system;
- b. Limiting the annual maintenance of the spray dryer/fabric filter system to no more than five days per year;
- c. Limiting the time when coking gases are not controlled by the spray dryer/fabric filter system to 1560 stack-hours¹ per 12-month rolling period; and
- d. Minimizing coal sulfur and reducing coke production to reduce SO₂ emissions from the coke ovens affected by the shutdown of a HRSG during planned HRSG maintenance by 28 percent, consistent with the Facility's Startup, Shutdown, and Malfunction plan.

25. Conditions C.6(b)(1)(l) of the 2015 Title V Permit and C.1(b)(1)(k) of the 2016 PTI both provide, in part, that SO₂ emissions shall not exceed 300 pounds per hour (lb/hr) on a 3-hour block average and 192.0 lb/hr on a 24-hour block average.

26. Conditions C.6(d)(1) of the 2015 Title V Permit and C.1(d)(1) of the 2016 PTI both require, in part, that MCC, except during bypass of the lime spray dryer and heat recovery steam generators as allowed in the permit, operate and maintain equipment to continuously monitor the pressure drop, in inches of water column (in W.C.), across the fabric filter following the lime spray dryer when P901 is in operation, including periods of startup and shutdown. The range or limit of 2 to 12 in W.C. on the pressure drop across fabric filter serving the lime spray dryer is effective for the duration of the permit, unless revisions are requested by the permittee and approved in writing by the permitting authority. In the event a monitored value for the pressure drop deviates from the limit or range specified in the permit, MCC is required to promptly investigate the cause of the deviation.

27. Conditions C.6(e)(1)(a-d) of the 2015 Title V Permit and C.1(e)(1)(a-d) of the 2016 PTI both require MCC to submit quarterly reports, which identify the following information:

¹ For the main stack, one stack-hour is equivalent to the exhaust from one HRSG being emitted to the atmosphere without being controlled by the spray dryer/fabric filter system for one hour. The 1560 stack-hour limit was determined by summing the five day annual outage limit for the spray dryer/fabric filter system (120 hours X 5 HRSGs = 600 stack-hours) and the 960 bypass hour limit for individual HRSG maintenance outside of the annual outage.

- a. Each period of time when the pressure drop was outside of the permitted range (2 to 12 in W.C.) as specified by the manufacturer and outside of the acceptable range following any required compliance demonstration;
- b. An identification of each incident of deviation described in “a.” (above) where a prompt investigation was not conducted;
- c. An identification of each incident of deviation described in “a.” where prompt corrective action, that would bring the unit into compliance with the acceptable range, was determined to be necessary and was not taken; and
- d. An identification of each incident of deviation described in “a.” where proper records were not maintained for the investigation and/or the corrective action(s).

28. Conditions C.6(c)(11) of the 2015 Title V Permit and C.1(c)(11) of the 2016 PTI both provide that continuous emission monitoring systems (CEMS) consist of, among other things, all the equipment used to perform sample extraction and to analyze and record/process data.

29. Conditions C.6(c)(12) of the 2015 Title V Permit and C.1(c)(12) of the 2016 PTI both require that MCC maintain the monitoring equipment, including but not limited to, maintaining necessary parts for routine repairs of the monitoring equipment.

30. Conditions C.6(d)(6) of the 2015 Title V Permit and C.1(d)(6) of the 2016 PTI both require, in part, MCC to operate and maintain equipment to continuously monitor and record SO₂ emissions from P901 in units of the applicable standard(s). The continuous monitoring and recording equipment shall comply with the applicable requirements specified in 40 C.F.R. Part 60.

31. Conditions C.6(d)(6)(f) of the 2015 Title V Permit and C.1(d)(6)(f) of the 2016 PTI both require MCC to maintain records of data obtained by the continuous SO₂ monitoring system including, but not limited to, hours of operation of the emissions unit, continuous SO₂ monitoring system, and control equipment.

32. Conditions C.6(e)(4)(a-b) of the 2015 Title V Permit and C.1(e)(4)(a-b) of the 2016 PTI both require, among other things, that MCC submit quarterly reports following the end of each calendar quarter documenting all instances of SO₂ emissions in excess of any applicable limit specified in the permit, and any SO₂ monitoring system downtime.

33. Conditions C.6(d)(13) of the 2015 Title V Permit and C.1(d)(13) of the 2016 PTI both require MCC, in part, to operate and maintain a monitoring system for mercury (Hg) emissions from the main stack at all times when the spray dryer/fabric filter system is operated (except during startup or shutdown of the spray dryer/fabric filter system or during periods of routine maintenance on the HAC injection system).

Information Request and Document Review

34. Pursuant to Section 114(a) of the CAA, 42 U.S.C. § 7414(a), EPA issued an Information Request to MCC on October 19, 2023.

35. On December 18, 2023, MCC provided a response to the Information Request (December 2023 Documents).

36. The information gathered from reviewing the December 2023 Documents includes, but is not limited to, the facts set forth below.

CEMS Downtime

37. On January 28, 2021, MCC submitted its 4th quarter 2020 excess emission report (EER) for SO₂ according to Condition C.6(e)(4) of the 2015 Title V permit.

38. On January 28, 2021, MCC submitted its 4th quarter 2020 EER for Hg according to Condition C.6(d)(13) of the 2015 Title V Permit.

39. The SO₂ and Hg EERs for EU P901 both reported 7.74% monitoring system downtime due to CEMS equipment malfunctions during normal operation of the EU for the 4th quarter 2020.

Fabric Filter Pressure Drop Deviations

40. The December 2023 Documents include records of pressure drop readings, in units of in W.C., across the fabric filter following the lime spray dryer when P901 is in operation.

41. The December 2023 Documents indicate that MCC had 17 deviations of the specified pressure drop range resulting in 41 hours where the monitored pressure values were outside of the range (2 to 12 in W.C.) specified in the 2015 Title V Permit.

42. MCC did not promptly report excursions of the specified pressure drop range that occurred on December 21, 2022, September 15, 2023, and September 19, 2023 in quarterly deviation reports submitted to OEPA.

SO₂ Emissions Exceedances

43. On November 21, 2020, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average because of a disruption of lime slurry flow in the spray dryer.

44. On November 17, 2021, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average because of a power interruption.

45. On April 19, 2022, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average because of a high voltage circuit breaker malfunction.

46. On June 13, 2022, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average because of a power outage caused by severe weather.

47. On March 12, 2023, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average and the 192 lb/hr SO₂ emissions limit for one 24-hour block average because of an uninterruptable power supply (UPS) failure that caused loss of power to the HRSGs and spray dryer/fabric filter system.

48. On March 14, 2023, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average and the 192 lb/hr SO₂ emissions limit for one 24-hour block average because MCC personnel failed to identify a redundant level indicator that is interlocked to the HRSG feedwater pumps while investigating a deaerator tank low level alarm, causing the pumps to trip when MCC personnel lowered the tank level as part of the troubleshooting activity.

49. On May 24, 2023, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average because of a UPS failure that caused loss of power to the HRSGs and spray dryer/fabric filter system.

50. On October 4, 2023, MCC exceeded the 300 lb/hr SO₂ emissions limit for three 3-hour block averages and the 192 lb/hr SO₂ emissions limit for one 24-hour block average because a hole developed in the wall of the fabric filter that required spray dryer/fabric filter bypass to repair.

51. On October 9, 2023, MCC exceeded the 300 lb/hr SO₂ emissions limit for one 3-hour block average during startup of the spray dryer/fabric filter system after a tube leak in HRSG #5 caused all HRSG bypass stack lids to open.

Bypass Venting

52. Attachment A summarizes HRSG bypass venting events from July 1, 2020 through December 31, 2023, including:

- a. Events where MCC notified OEPA of scheduled maintenance at least two weeks in advance and/or received OEPA Director's approval for scheduled maintenance in accordance with OAC Rule 3745-15-06(A)(3); and
- b. Events that resulted from emergent equipment failures.

53. Attachment A shows that, between July 1, 2020 and December 31, 2023, MCC vented coke oven gas through the HRSG bypass stacks because of HRSG system failures for at least 1,346 stack-hours, with approximately 97% of these stack-hours caused by failures of HRSG pressure parts (*i.e.*, "tube leaks").

54. The 2015 Title V Permit and 2016 PTI do not allow bypass venting of gases from the coking process because of HRSG system failures. As stated at paragraphs 22–23 above, the 2015 Title V Permit and 2016 PTI only allow HRSG bypass venting under specific conditions, primarily planned maintenance. Limiting permitted bypass venting to planned maintenance periods is intended to achieve and maintain compliance with "Lowest Achievable Emission Rate" (LAER), "Prevention of Significant Deterioration" (PSD), and "Best Available Control Technology" (BACT) emission limits.

55. As owner and operator, MCC controls the design, operation, and maintenance of the HRSG system installed at the Facility, including operation of the HRSG steam cycle.

56. Proper water treatment of HRSG feedwater and HRSG steam drum water prevents corrosion and deposition within steam cycle components (*e.g.*, boiler tubes) that may lead to component failure.

57. The December 2023 Documents indicate that MCC has failed to monitor water chemistry parameters of the HRSG steam cycle in a manner consistent with manufacturer recommendations. Further, water chemistry data provided in the December 2023 Documents indicate numerous instances of HRSG operation outside of normal ranges that MCC has established for water chemistry parameters.

Violations

58. MCC failed to continuously monitor and record the SO₂ and Hg emissions for 171 hours in the 4th quarter of 2020, in violation of Conditions C.6(d)(6) and C.6(d)(13) of the 2015 Title V Permit and Conditions C.1(d)(6) and C.1(d)(13) of the 2016 PTI.

59. MCC failed to promptly report pressure drop exceedances that occurred on December 21, 2022, September 15, 2023, and September 19, 2023, in violation of Condition C.6(e)(1)(a-d) of the 2015 Title V Permit and Condition C.1(e)(1)(a-d) of the 2016 PTI.

60. Between November 21, 2020 and October 9, 2023, MCC exceeded the 300 lb/hr 3-hour block average SO₂ emissions limit for 33 hours, in violation of Condition C.6(b)(1)(l) of the 2015 Title V Permit and Condition C.1(b)(1)(k) of the 2016 PTI.

61. Between March 12, 2023 and October 4, 2023, MCC exceeded the 192 lb/hr 24-hour block average SO₂ emissions limit for 72 hours, in violation of Condition C.6(b)(1)(l) of the 2015 Title V Permit and Condition C.1(b)(1)(k) of the 2016 PTI.

62. Between August 1, 2020 and December 31, 2023, MCC vented coke oven gas through the HRSG bypass stacks for 1,346 stack-hours because of HRSG system failures, in violation of Conditions C.6(c)(1) and C.6(c)(7) of the 2015 Title V Permit and Conditions C.1(c)(1) and C.1(c)(7) of the 2016 PTI.

63. Pursuant to 42 U.S.C. § 7413(a)(1), the violations described above are violations of the Ohio SIP.

Michael D. Harris
Division Director
Enforcement and Compliance Assurance Division

Attachment A: HRSG Bypass Venting Summary

Tables A-1 through A-5 summarize the venting of coke oven gas through the HRSG bypass stacks from July 1, 2020 to December 31, 2023, based on the Semi-Annual HRSG Waste Gas Bypass Venting Summary Reports submitted by MCC to OEPA pursuant to Condition C.6(e)(7) of the 2015 Title V Permit.

Table Legend

Start	Date on which a bypass venting event began, excluding times where the vent stack lid was open but coke oven gas was not vented as a result of burning natural gas and/or gas sharing
End	Date on which a bypass venting event ended
Venting (stack hrs)	The total duration of stack-hours where coke oven gas was vented through a HRSG bypass stack
Planned?	Indication of whether the HRSG bypass venting was a result of planned maintenance where MCC notified OEPA at least two weeks in advance and/or received OEPA Director's approval for scheduled maintenance in accordance with OAC Rule 3745-15-06(A)(3) ("Yes") or an emergent equipment failure ("No")
SD/FF Maint?	Indication of whether planned maintenance of the spray dryer/fabric filter system was occurring during the HRSG bypass venting event ("Yes" or "No")
HRSG Failure?	Indication of whether the HRSG bypass venting was a result of a failure within the HRSG system, including steam cycle components such as the turbine and cooling tower ("Yes" or "No").
Cause	Brief summary of the cause of the HRSG bypass venting event as reported by MCC

Table A-1. HRSG #1 Bypass Events (Excluding Monthly Stack Lid Testing)

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
9/25/20	9/27/20	60.68	No	No	Yes	Evaporator tube leak	Includes 0.18 hours of bypass venting from HRSG #2 caused by the emergent event in HRSG #1
10/18/20	11/9/20	513.32	Yes	Yes	No	Annual outage, including replacement of certain HRSG #1 superheater and water wall tubes	OEPA Director authorization for extended outage exceeding permit bypass limits
11/20/20	11/20/20	1.03	Yes	No	No	Replace stack lid	---
11/30/20	12/4/20	105.15	No	No	Yes	Evaporator tube leak	Includes 2.00 hours of bypass venting from HRSG #2 and 1.67 hours of bypass venting from HRSG #3 caused by the emergent event in HRSG #1
3/7/21	3/9/21	57.78	No	No	Yes	Evaporator tube leak	Includes 1.03 hours of bypass venting from HRSG #2 caused by the emergent event in HRSG #1
4/18/21	4/26/21	197.25	Yes	No	No	Inspection, cleaning, and boiler tube repairs (34 evaporator tubes replaced)	---
6/3/21	6/3/21	4.15	No	No	No	Plant-wide power outage	---
6/8/21	6/10/21	59.26	No	No	Yes	Evaporator tube leak	Includes 0.33 hours of bypass venting from HRSG #2 caused by the emergent event in HRSG #1
10/28/21	10/29/21	10.52	Yes	No	No	End of HRSG #1 outage using gas sharing (time between coal charge and lid closure)	---
10/31/21	11/5/21	112.68	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits
11/16/21	11/16/21	2.62	No	No	Yes	Deaerator vacuum valve repair	---
11/17/21	11/17/21	3.33	No	No	No	Power interruption	---
12/6/21	12/6/21	0.83	No	No	Yes	Turbine Trip	---
3/8/22	3/8/22	3.20	No	No	No	High Voltage Circuit Breaker	---
4/8/22	4/8/22	3.85	No	No	No	High Voltage Circuit Breaker	---

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSR Failure?	Cause	Comments
4/19/22	4/20/22	4.10	No	No	No	High Voltage Circuit Breaker	---
6/13/22	6/13/22	1.90	No	No	No	Power interruption/severe weather	---
8/11/22	8/12/22	18.10	Yes	Yes	No	Duct Repair	---
10/29/22	11/6/22	180.51	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSRs, exceeding permit bypass limits (includes authorized HRSR maintenance prior to and following SD/FF maintenance)
1/23/23	1/24/23	11.58	Yes	No	No	Stack lid repair	---
1/27/23	1/27/23	1.12	Yes	No	No	Stack lid replacement and test cycling	---
3/12/23	3/12/23	9.75	No	No	No	Uninterruptible power supply failure	---
6/1/23	6/4/23	71.90	Yes	No	No	End of HRSR #1 outage for HRSR Upgrade Campaign using gas sharing and burning natural gas	---
10/4/23	10/4/23	7.47	No	No	No	Repair hole in wall of baghouse	---
10/9/23	10/9/23	4.68	No	No	Yes	Loss of system pressure due to HRSR #5 tube leak	---
11/1/23	11/6/23	115.45	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSRs, exceeding permit bypass limits

Table A-2. HRSG #2 Bypass Events (Excluding Monthly Stack Lid Testing)

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
10/18/20	11/9/20	513.15	Yes	Yes	No	Annual outage	OEPA Director authorization for extended outage exceeding permit bypass limits
2/25/21	2/26/21	8.77	Yes	No	No	Stack lid maintenance	---
5/15/21	5/17/21	59.23	No	No	Yes	Evaporator tube leak	Includes 1.00 hours of bypass venting from HRSG #1 caused by the emergent event in HRSG #2
6/3/21	6/3/21	4.28	No	No	No	Plant-wide power outage	---
9/17/21	9/20/21	66.95	No	No	Yes	Evaporator tube leak	---
10/31/21	11/13/21	319.68	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits (includes authorized HRSG maintenance prior to and following SD/FF maintenance)
11/16/21	11/16/21	2.03	No	No	Yes	Deaerator vacuum valve repair	---
11/17/21	11/17/21	3.55	No	No	No	Power interruption	---
11/22/21	11/22/21	0.83	No	No	Yes	Turbine generator fault	---
11/29/21	12/1/21	46.83	No	No	Yes	Evaporator tube leak	---
12/6/21	12/6/21	0.87	No	No	Yes	Turbine Trip	---
1/31/22	2/2/22	59.35	No	No	Yes	Evaporator tube leak	---
3/8/22	3/8/22	3.30	No	No	No	High Voltage Circuit Breaker	---
4/8/22	4/8/22	4.00	No	No	No	High Voltage Circuit Breaker	---
7/9/22	7/12/22	77.84	Yes	No	No	Cleaning, maintenance, and tube replacements at superheater, evaporator, economizer, and water-wall locations	HRSG #2 outage began on 4/18/22, but coke oven gas was not vented through the HRSG #2 bypass stack until 7/9/22 as a result of natural gas combustion and gas sharing during maintenance activity.
8/11/22	8/12/22	18.10	Yes	Yes	No	Duct repair	---
10/31/22	11/5/22	116.69	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits; 0.92 bypass hours occurred outside of spray dryer/fabric filter system maintenance

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
2/8/23	2/8/23	20.12	No	No	Yes	Steam drum leak	---
3/12/23	3/12/23	9.75	No	No	No	Uninterruptible power supply failure	---
3/14/23	3/14/23	3.42	No	No	Yes	Deaerator tank Lo-Lo alarm	---
5/23/23	5/24/23	7.65	No	No	No	Uninterruptible power supply failure	---
6/17/23	6/23/23	140.30	Yes	No	No	HRSG cleaning, inspection, and repair	---
7/1/23	7/2/23	0.16	No	No	No	Power interruption/severe weather	---
10/4/23	10/4/23	7.47	No	No	No	Repair hole in wall of baghouse	---
10/9/23	10/9/23	4.68	No	No	Yes	Loss of system pressure due to HRSG #5 tube leak	---
11/1/23	11/6/23	115.45	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits

Table A-3. HRSG #3 Bypass Events (Excluding Monthly Stack Lid Testing)

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
8/1/20	8/3/20	39.50	No	No	Yes	Tube leak	---
10/18/20	11/10/20	557.23	Yes	Yes	No	Annual outage	OEPA Director authorization for extended outage exceeding permit bypass limits
5/15/21	5/19/21	82.42	Yes	No	Yes	Evaporator tube leak	---
6/3/21	6/3/21	2.93	No	No	No	Plant-wide power outage	---
6/20/21	6/22/21	60.15	No	No	Yes	Evaporator tube leak	---
8/28/21	8/31/21	61.08	No	No	Yes	Evaporator tube leak	---
9/30/21	10/1/21	3.75	Yes	No	No	End of HRSG #3 outage using gas sharing (time between coal charge and lid closure)	---
10/20/21	10/20/21	1.65	Yes	No	No	Stack lid replacement	---
10/31/21	11/5/21	112.43	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits
11/16/21	11/16/21	1.88	No	No	Yes	Deaerator vacuum valve repair	---
11/17/21	11/17/21	3.40	No	No	No	Power interruption	---
11/22/21	11/22/21	1.08	No	No	Yes	Turbine generator fault	---
12/6/21	12/6/21	0.77	No	No	Yes	Turbine Trip	---
2/14/22	2/17/22	72.39	No	No	Yes	Economizer tube leak	---
3/8/22	3/11/22	80.08	No	No	Yes	Economizer tube leak	---
3/21/22	3/29/22	52.11	No	No	Yes	Economizer tube leak	Venting time while burning natural gas not included in venting stack hours
4/8/22	4/8/22	3.82	No	No	No	High Voltage Circuit Breaker	---
4/19/22	4/20/22	4.15	No	No	No	High Voltage Circuit Breaker	---
6/13/22	6/13/22	1.90	No	No	No	Power interruption/severe weather	---
8/11/22	8/12/22	18.12	Yes	Yes	No	Duct repair	---
10/22/22	10/28/22	148.30	Yes	No	No	HRSG maintenance	MCC submitted a maintenance notification for HRSG #1 but instead performed maintenance on HRSG #3 based on anticipated equipment condition and resource availability.

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRS Failure?	Cause	Comments
10/29/22	11/5/22	116.72	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits; 0.95 bypass hours occurred outside of spray dryer/fabric filter system maintenance
3/8/23	3/9/23	27.70	Yes	No	No	Vent stack cleaning	---
3/12/23	3/12/23	9.75	No	No	No	Uninterruptible power supply failure	---
3/14/23	3/14/23	3.42	No	No	Yes	Deaerator tank Lo-Lo alarm	---
5/23/23	5/24/23	7.65	No	No	No	Uninterruptible power supply failure	---
8/31/23	9/5/23	102.06	Yes	No	No	End of HRSG #3 outage for HRSG Upgrade Campaign, including cleaning, preventative maintenance, and tube replacement at superheater, evaporator, economizer, and water-wall locations	HRSG #3 outage began on 6/28/23, but coke oven gas was not vented through the HRSG #3 bypass stack until 8/31/23 as a result of natural gas combustion and gas sharing during maintenance activity
9/17/23	9/19/23	38.95	No	No	Yes	Superheater steam blowdown line leak	---
9/27/23	9/27/23	12.98	No	No	Yes	Cooling tower recirculation pump failure	---
10/4/23	10/4/23	7.47	No	No	No	Repair hole in wall of baghouse	---
10/9/23	10/9/23	4.68	No	No	Yes	Loss of system pressure due to HRSG #5 tube leak	---
11/1/23	11/6/23	115.45	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits

Table A-4. HRSG #4 Bypass Events (Excluding Monthly Stack Lid Testing)

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
10/18/20	11/9/20	513.27	Yes	Yes	No	Annual outage	OEPA Director authorization for extended outage exceeding permit bypass limits
5/4/21	5/4/21	2.87	No	No	Yes	False drum level reading	---
6/3/21	6/3/21	3.47	No	No	No	Plant-wide power outage	---
9/2/21	9/3/21	10.32	Yes	No	No	End of HRSG #4 outage using gas sharing (time between coal charge and lid closure)	---
10/31/21	11/5/21	112.37	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits
11/16/21	11/16/21	1.88	No	No	Yes	Deaerator vacuum valve repair	---
11/17/21	11/17/21	2.75	No	No	No	Power interruption	---
11/22/21	11/22/21	1.12	No	No	Yes	Turbine generator fault	---
12/6/21	12/6/21	0.83	No	No	Yes	Turbine Trip	---
3/8/22	3/8/22	2.92	No	No	No	High Voltage Circuit Breaker	---
3/31/22	3/31/22	0.80	Yes	No	No	Stack lid refractory repair	---
4/8/22	4/8/22	3.77	No	No	No	High Voltage Circuit Breaker	---
4/19/22	4/20/22	4.17	No	No	No	High Voltage Circuit Breaker	---
4/20/22	4/20/22	7.90	Yes	No	No	Stack lid refractory repair	---
6/9/22	6/9/22	0.88	Yes	No	No	Stack lid replacement	---
6/13/22	6/13/22	1.90	No	No	No	Power interruption/severe weather	---
7/13/22	7/15/22	55.35	No	No	Yes	Economizer tube leak	
8/2/22	8/3/22	12.08	Yes	No	No	End of HRSG #4 outage to repair 19 economizer tubes	Maintenance began on 7/26/22, but coke oven gas was not vented until 8/2/22 due to gas sharing and burning natural gas
8/11/22	8/12/22	18.20	Yes	Yes	No	Duct repair	---
8/24/22	8/26/22	38.13	No	No	Yes	Economizer tube leak	---

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
10/31/22	11/5/22	116.77	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits; 1.00 bypass hours occurred outside of spray dryer/fabric filter system maintenance
3/12/23	3/12/23	9.75	No	No	No	Uninterruptible power supply failure	---
3/14/23	3/14/23	3.42	No	No	Yes	Deaerator tank Lo-Lo alarm	---
5/23/23	5/24/23	7.65	No	No	No	Uninterruptible power supply failure	---
10/4/23	10/4/23	7.47	No	No	No	Repair hole in wall of baghouse	---
10/9/23	10/9/23	4.88	No	No	Yes	Loss of system pressure due to HRSG #5 tube leak	---
10/11/23	10/17/23	159.99	No	No	Yes	Water-wall tube leak	---
10/31/23	11/6/23	139.46	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits (includes authorized HRSG maintenance prior to SD/FF maintenance)
12/20/23	12/20/23	0.72	No	No	No	Pressure drop deviation	---

Table A-5. HRSG #5 Bypass Events (Excluding Monthly Stack Lid Testing)

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
8/25/20	8/25/20	0.22	No	No	Yes	High steam temperature	---
10/13/20	11/9/20	633.25	Yes	Yes	No	Annual outage	OEPA Director authorization for extended outage exceeding permit bypass limits
3/12/21	3/12/21	1.18	Yes	No	No	Stack lid replacement	---
5/21/24	5/24/24	9.68	Yes	No	No	Stack lid repair	---
6/3/21	6/3/21	4.87	No	No	No	Plant-wide power outage	---
11/17/21	11/18/21	15.22	Yes	No	No	End of HRSG #5 outage using gas sharing (time between coal charge and lid closure)	---
11/22/21	11/22/21	0.92	No	No	Yes	Turbine generator fault	---
12/6/21	12/6/21	0.58	No	No	Yes	Turbine Trip	---
3/8/22	3/8/22	2.78	No	No	No	High Voltage Circuit Breaker	---
4/8/22	4/8/22	3.72	No	No	No	High Voltage Circuit Breaker	---
4/19/22	4/20/22	4.22	No	No	No	High Voltage Circuit Breaker	---
6/13/22	6/13/22	1.90	No	No	No	Power interruption/severe weather	---
8/11/22	8/12/22	18.32	Yes	Yes	No	Duct repair	---
10/31/22	11/8/22	116.77	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits; 59.31 bypass hours occurred outside of spray dryer/fabric filter system maintenance
11/30/22	11/30/22	2.22	No	No	No	Expansion joint refractory repair	---
1/13/23	1/13/23	0.40	Yes	No	No	Vent stack lid inspection	---
1/28/23	1/28/23	0.70	No	No	Yes	Steam drum Hi-Hi level alarm	---
3/12/23	3/12/23	9.75	No	No	No	Uninterruptible power supply failure	---
3/14/23	3/14/23	3.42	No	No	Yes	Deaerator tank Lo-Lo alarm	---
5/23/23	5/24/23	7.65	No	No	No	Uninterruptible power supply failure	---
10/4/23	10/4/23	7.47	No	No	No	Repair hole in wall of baghouse	---

Start	End	Venting (stack hrs)	Planned?	SD/FF Maint?	HRSG Failure?	Cause	Comments
10/9/23	10/20/23	141.48	---	No	Yes ²	Water-wall tube leak and HRSG maintenance	MCC submitted a request to OEPA for maintenance of HRSG #5 as part of the annual outage beginning on 10/30/23; MCC moved up the scheduled maintenance and has asserted that 136.65 bypass venting hours following the tube leak event are part of this scheduled maintenance
11/1/23	11/6/23	115.45	Yes	Yes	No	Annual outage	OEPA Director authorization for bypass of five individual HRSGs, exceeding permit bypass limits

² 4.83 stack-hours were counted towards total bypass venting hours from HRSG system failures.