ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217)782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

MEMORANDUM

DATE: November 16, 2020

TO: Maureen Wozniak, Kent Mohr,
Eric Jones and Ron Robeen

FROM: Yasmine Keppner-Bauman, Compliance Unit

RE: Proposed Compliance Commitment Agreement from
Koppers Inc
Violation Notice A-2020-00307
I.D. 031300AAJ

COMMENTS DUE TO Compliance Unit BY November 23, 2020

Please find attached a proposed Compliance Commitment Agreement (CCA) received from the facility in response to the above-referenced Violation Notice dated August 27, 2020.

Please provide your recommendations on whether we should send a proposed CCA or reject the proposed terms and send a Notice of Non-Issuance of a CCA.

NOTE: In your response to the Compliance Unit analyst, please indicate the following:

- **If your recommendation is to send a proposed CCA, include whether you believe the company's proposed terms are acceptable and if you have any suggested conditions for the proposed CCA.**

- **If your recommendation is to send a Notice of Non-Issuance of a CCA, include a recommendation for the next action (e.g., NITPL/refer, drop, track, etc.). This information will be discussed at the next CDG meeting.**

Once a decision is reached on the response, the Compliance Unit will either send a proposed CCA or Notice of Non-Issuance of a CCA.

November 10, 2020

Yasmine Keppner-Bauman
Illinois Environmental Protection Agency
Bureau of Air/Filed Operations Section
1021 North Grand Ave. East
P.O. Box 19276
Springfield, IL 62794-9276

Re: Violation Notice A-2020-00307
ID: 031300AAJ

Dear Ms. Keppner-Bauman:

Koppers Inc. ("Koppers") thanks the Illinois Environmental Protection Agency ("IEPA") for virtually meeting on October 20, 2020 to discuss Violation Notice A-2020-00307 and for its consideration of this supplemental, post-meeting response to the Violation Notice.

During our meeting on October 20, 2020, IEPA requested certain, additional information with respect to Koppers' initial response to the Violation Notice. Below, Koppers provides its supplemental response, which should be read in connection with its October 9, 2020, initial response ("Initial Response"), incorporated herein by reference.

1. Section 39.5(6)(a) of the Act and condition 7.7.8(d)(i) of Clean Air Act Permit Program (CAAPP) permit 96030134: Koppers Inc. failed to operate the continuous emissions monitoring system (CEMS) to monitor and record sulfur dioxide (SO_2) emissions from the phthalic anhydride reactor trains to provide permanent records of the hourly average SO2 emissions based upon three minute samples of air flows and SO_2 concentrations on multiple occasions during the July - December 2019 reporting period.

Supplemental Response:

The SO_2 CEMS monitor availability has improved since the July - December 2019 reporting period. The summary below shows the positive trend in monitor availability. Historically, the SO_2 monitor has been available more than 95% of the operating hours. The exception was during the second half of 2019, when a change in spare parts inventory software and the unavailability of the contracted service technician combined to contribute to temporary decreased CEMS monitor availability.

The change from MP2 Software to Navision (a.k.a. Microsoft Dynamics Nav) for inventory management led to challenges in locating spare parts at the facility, and when parts were determined not to be in inventory, ordering of spare parts had to be initiated. During implementation of the Navision system all parts received new inventory numbers, obsolete parts were eliminated and critical parts were identified in the system.

In addition to challenges with the spare parts inventory software migration, the availability of the technician contracted to service the CEMS contributed to CEMS monitor downtime during the July - December 2019 reporting period. The contractor works for CEMTEK. Koppers is negotiating additional contract services from CEMTEK for more responsive field services and routine training of Koppers staff on CEMS repair. The contract will include an identification of a back-up service technician in the event that the primary technician is unavailable.

Summary of SO_2 CEMS Monitor Availability

Parameters	Time Period			
	First Half 2019	Second Half 2019	First Half 2020	July - October 2020
SO_2 CEMS Downtime	97	720	139	25
Operating Hours	8107	7359	8113	5357.5
% Monitor Availability	98.8%	90.2%	98.3%	99.5%

Attachment 1 to this supplemental response contains a list of CEMS down time causes, and corrective actions taken for the 720 and 139 hours that the CEMS system was not available. The plant experienced challenges with the data acquisition during the July - December 2019 reporting period. Communications between the CEMS and the plant control system and data historian was interrupted periodically during the period for unknown reasons. The condition was transient during the reporting period and resulted in missing data for the CEMS, even during times when the CEMS was operating properly. Koppers is investigating options to resolve this situation, including improvements to the current system and evaluating the addition of a stand-alone data acquisition and handling system.

2. Section 39.5(6)(a) of the Act and condition 7.7.8(d)(ii) of CAAPP permit 96030134: Koppers Inc. failed to maintain the phthalic anhydride reactor feeds at previous feed rates on multiple occasions during the reporting period of July - December 2019 when the CEMS unit failed to monitor SO_2 as required.

Supplemental Response:

Two organic raw materials are used in the production of phthalic anhydride: naphthalene and orthoxylene. Naphthalene contains trace amounts of sulfur which is converted to SO_2. Increasing the feed rate of naphthalene will result in more SO_2 emissions while increasing the feed rate of orthoxylene should not.

There can be safety issues related to organic feed flow that must be managed to minimize risk of harm to personnel. The set of circumstances under which these issues require an increase in feed flow are narrow, but they must be accounted for to avoid possible fire or loss of material containment. For instance, the oxidation process provides vacuum control for the plant. If the oxidation process shuts down, the distillation process will over-pressure, increasing the risk of loss of containment and fire. As a result, if the oxidation process is running at minimum rates and there is a problem with the orthoxylene feed, the naphthalene feed must be increased before the orthoxylene feed can be shut down. This process only takes a few minutes, so the impact on SO_2 emissions is minimal, but it keeps flammable material inside the process equipment.

While investigating these issues in response to IEPA's violation notice, Koppers has found that the deviations from the permit were related to training rather than to safety and has, as reflected in Attachment 2 to this supplemental response, updated its procedures accordingly. Training on the new procedures will be completed during the week of November 16 due to quarantines and delays related to Covid-19.

3. Sections 9(b) and 9.1(d) of the Act, condition 3 of construction permit 08040005 and 40 CFR 63.2470: Koppers Inc. may have failed to meet each emission limit in Table 4 of 40 CFR 63 Subpart FFFF - National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing for its pitch storage tanks on multiple occasions during the July -December 2019 reporting period when the thermal oxidizer operated below temperature.

Supplemental Response:

There are numerous conditions in the pitch thermal oxidizer ("TO") that can cause the device to automatically shut down to prevent unsafe conditions. These alarm conditions are listed in the table in Attachment 3 to this supplemental response. There are two types of devices that may cause the pitch TO to shut down: analog transmitters and digital switches.

The type of device that causes each shutdown effects the subsequent response. The analog transmitter outputs are recorded in the data historian. This allows for some root cause analysis of each shutdown after the pitch TO is restarted. The condition of the digital switches, however, are not recorded in the data historian and there is no alarm history to allow for later root cause analysis of those events. As a result, if the pitch TO restarts and runs reliably following a shutdown caused by a digital switch condition the issue is considered resolved. If the device will not run, electricians troubleshoot and determine root cause.

Koppers has expanded the information provided in Attachment 2 to the Initial Response to include causes and corrective actions for the listed periods when the pitch TO temperature did not achieve the target value. The table for the Pitch process is included as Table 1 in Attachment 4 to this supplemental response.

4. Section 9(b) of the Act and condition 4(b) of construction permit 08040005: Koppers Inc. may have failed to operate the thermal oxidizer for the pitch tanks to achieve at least 98% destruction efficiency for VOM on multiple occasions during the July - December 2019 reporting period when the thermal oxidizer operated below temperature.

Supplemental Response:

Please see the response provided to item #3 above as they are the same for both #3 and #4.

5. Section 9.1(d) of the Act and 40 CFR 63.113(a)(2): Koppers Inc. may have failed to reduce emissions of total organic hazardous air pollutants by 98 weight-percent from process vents on multiple occasions during the October 2019 - March 2020 timeframe when the naphthalene plant thermal oxidizer operated out of temperature range.

Supplemental Response:

The Naphthalene Plant is the newest process constructed at the Stickney facility and the process operations staff and engineers continue to learn the operational incidents that this new plant experiences. Through the course of the reporting period of October 2019 to the end of March 2020, several types of malfunctions resulted in the majority of failures for the naphthalene plant TO to meet the target temperature of 1436°F. Those are explained in some detail below.

Flame Sensor - Thermal Oxidizer Interlock:

Multiple flame failures occurred during transitions of process waste gas from the naphthalene processes to the naphthalene plant TO in this reporting period. When this issue arose, Koppers immediately began extensive troubleshooting among engineering, maintenance, and operations, which lead to discovery of the root cause and necessary changes being made in December 2019. The issue was that the flame detector only picks up wavelength in the ultraviolet range and is pointed at the outer ring of the flame. When process waste gas was directed to the naphthalene plant TO, the outer ring of the flame changed characteristics and burned in the Infrared wavelength spectrum causing the detector to not work properly. This issue occurred intermittently during high concentrations of benzene, toluene, and xylene, which are organic compounds found in the process waste stream that burn in the infrared range.

Once the root cause was understood and verified, a second detector was placed pointing towards the middle of the flame. This added reliability since the middle of the flame burns in the ultraviolet range due to natural gas being the fuel. Once this change was made, the flame failure caused by the flame sensors during transition was corrected.

Thermal Oxidizer, Scrubber Interlock:

The TO, which is used to control organic emissions, is immediately followed by the caustic scrubber, which reduces SO_2 and particulate emissions. These two control devices are interlocked to shut down the naphthalene plant TO if there is a malfunction in the scrubber. This is needed to keep the high temperatures from the TO from damaging the scrubber.

Salt scale deposit issues in the scrubber have proven difficult to resolve, but significant progress has been made. Level and flow instruments have been repeatedly cleaned after becoming fouled with salt scale deposits. In order to mitigate this, Koppers has emptied the scrubber multiple times and used different descaling chemicals to clean the system. The blowdown control has also been changed to reduce the buildup of salt in the system. Scale is a long-term problem and Koppers continues to evaluate the effectiveness of the corrective actions already taken.

Thermal Oxidizer, Hot Oil System Interlock:

As an energy efficiency program at Koppers, the waste heat from the naphthalene plant TO is used to heat hot oil in a heat exchanger system. The energy from the hot oil is used in the Naphthalene Plant in lieu of additional boiler capacity. For safety purposes, the interlock shuts down the TO if the oil level in the hot oil system falls below a safe level.

The malfunction on 11/23/19 was the result of a leak in the oil system, which was repaired. Prior to subsequent malfunction events on 12/02/20 and 03/06/20, the hot oil system controls were in manual mode following system upset. When the hot oil cools down the cooling system automatically shuts down to reduce thermal cycling. In these instances, the operator failed to manually turn on the cooling fan, which caused the oil to overheat and the naphthalene plant TO to shut down. Koppers installed on-screen indicators to alert operators that the process is in manual mode and updated operator training was conducted.

Velocity Section DP interlock:

The velocity differential pressure acts as a safety device once process waste gas is directed towards the naphthalene plant TO. The setpoint for this interlock was set during commissioning. The setpoint was set close to steady state operations in accordance with the manufacturer's literature. The setpoint could not be changed immediately since the manufacturer was out of business and could not assist with the issue. Koppers' engineers were able to lower this setpoint only after a design change that greatly restricted the flow to the TO. Due to the safety implications, the effort took months of research, planning, engineering, and execution. Once this setpoint was lowered in March of 2020, the DP interlock is no longer a common occurrence.

In regards to the listed times when the naphthalene plant TO temperature was not achieved, Koppers wishes to advise IEPA that the TO target temperature of 1436°F was established in the initial compliance testing of the TO. In September of 2020, Koppers performed a compliance test to determine if the 98% destruction efficiency requirement of the NESHAP could be achieved at a lower temperature. This testing confirmed that 98% control of hazardous air pollutants is achieved at 1400°F. Of the 23 events listed in Attachment 3 to the Initial Response, nine of those events have a temperature above 1400°F and the 98% destruction efficiency was achieved.

Koppers has expanded the information to Attachment 3 to the Initial Response to include causes and corrective actions for the listed periods when the thermal oxidizer temperature did not achieve the target value. The table for the Naphthalene Plant process is included as Table 2 in Attachment 4 to this supplemental response.

6. Section 9.1(d) of the Act and 40 CFR 63.119(e): Koppers Inc. may have failed to reduce emissions of total organic hazardous air pollutants as required for storage vessels on multiple occasions during the December 2019 and January 2020 timeframe when the tar thermal oxidizer operated out of temperature range.

Supplemental Response:

Six instances were identified when the tar TO chamber temperature did not operate at the required temperature. Four of those days were related to power disruption. After one power outage in December 2019, the tar TO was restarted immediately. A second power outage in January 2020 resulted in a major disruption of operations at the Koppers facility and the tar and naphthalene processes had extended down time. The tar TO was restarted before the process equipment was brought online or tank transfers or loading began again. As a result, tank breathing losses were minimized while the tar TO was out of service.

Koppers has expanded the information to Attachment 4 to the Initial Response to include causes and corrective actions for the listed periods when the tar TO temperature did not achieve the target value. The table for the storage tanks in Naphthalene and the Tar TO is included as Table 3 in Attachment 4 to this supplemental response.

7. Section 9.1(d) of the Act and 40 CFR 63.104(a): Koppers Inc. failed to timely monitor each heat exchange system used to cool process equipment in a chemical manufacturing process unit when it failed to conduct sampling of cooling tower CT-1 until March 2020.

Supplemental Response:

In response to IEPA's request, Koppers conducted a detailed review of the monitoring program in place for the Naphthalene cooling tower. As a result of that detailed review, it was discovered that the sampling point for the return line of the cooling tower was improperly placed. The effect is that TOC samples for the return line were not obtained in the 7 months of monitoring and the monitoring data only represents the cooling tower supply and the coolant makeup water. This data is summarized in Table 1 in Attachment 5 to this supplemental response.

Koppers quickly corrected this problem by sampling the supply and return lines in late October and confirming that no volatile organic materials and hazardous air pollutants are leaking into the coolant of the cooling tower. The results of this sampling are provided in Table 2 and the statistical test to confirm that no leak is detected is provided in Table 3 of Attachment 5 to this supplemental response.

Finally, Illinois EPA requested copies of the Startup Shutdown Malfunction (SSM) Plans for the Naphthalene and Tar Plant air pollution control equipment. These SSM Plans are included as Attachments 6 and 7.

Koppers is hopeful that the foregoing, supplemental information requested by IEPA is helpful to the agency it considers resolution of the alleged violations. As previously relayed, it remains Koppers' desire to cooperatively participate in the Section 31 enforcement process and, if determined to be necessary, to work with IEPA toward a mutually-acceptable Compliance Commitment Agreement.

Thank you for considering this supplemental response to the Violation Notice. Please contact me, or Charvi Payghode, Environmental Manager (708-222-4688, Payghodeck@koppers.com), if you would like to discuss Koppers response or require any additional information. We look forward to receiving IEPA's written response and working towards a satisfactory resolution of these matters.

Sincerely,

L. Seth Herring
Plant Manager
Carbon Materials and Chemicals

Attachments:
1 – CEMS Down Time Causes and Corrective Actions
2 – Updated Operating Procedure for PAA
3 – Pitch Thermal Oxidizer Alarm Conditions
4 - Listed Cause and Corrective Actions for SSM Events
5 – Naphthalene Cooling Tower Data
6 – Naphthalene SSM Plan
7 – Tar SSM Plan

Attachment 1 - Listed SO_2 Monitor Downtime Cause and Corrective Action

Attachment 1

Koppers CEMS Downtime Summary

Start Time	End Time	A-Train Valid Hour	B-Train Valid Hour	Downtime Causes & Corrective Actions
7/2/19 21:00	7/3/19 22:00	No	Yes	Data acquisition intermittent fai ure
8/30/19 16:00	8/30/19 17:00	No	Yes	8/27/2019 incorrect bottle instal ed - an SO_2 bottle with the incorrect gas range was installed, corrected when discovered through daily calibration.
8/31/19 16:00	8/31/19 17:00	No	Yes	Data acquisition intermittent failure
9/1/19 16:00	9/1/19 17:00	No	Yes	Data acquisition intermittent failure
9/2/19 3:00	9/2/19 6:00	No	Yes	Data acquisition intermittent failure
9/6/19 3:00	9/6/19 8:00	Yes	No	PLC/HMI locked up and the analyzer requiring service
9/6/19 23:00	9/16/19 13:00	Yes	No	PLC/HMI locked up and the analyzer requiring service
9/16/19 13:00	9/17/19 13:00	No	No	PLC/HMI locked up and the analyzer requiring service
9/24/19 9:00	9/24/19 11:00	No	No	Data acquisition intermittent failure
9/28/19 10:00	10/1/19 10:00	No	Yes	Data acquisition intermittent failure
10/17/19 13:00	10/17/19 22:00	Yes	No	Data acquisition intermittent failure
10/18/19 11:00	10/18/19 13:00	Yes	No	Data acquisition intermittent failure
10/21/19 5:00	10/21/19 6:00	Yes	No	Data acquisition intermittent failure
10/23/19 5:03	11/1/19 5:00	Yes	No	Data acquisition intermittent failure
11/3/19 6:03	11/4/19 13:00	No	No	Issues with the SO_2 analyzer lamp
11/4/19 13:00	11/6/19 20:00	Yes	No	Issues with the SO_2 analyzer lamp
12/20/19 18:00	12/22/19 11:00	Yes	No	Problem with vacuum pump that affected A & B. CEMS contractor rectified the pump situation and replaced a lamp for the analyzer, and conducted a calibration check.
2/1/20 12:00	2/1/20 14:00	No	No	Data acquisition intermittent failure
2/3/20 0:00	2/4/20 6:00	No	No	Data acquisition intermittent failure
2/23/20 14:00	2/23/20 18:00	Yes	No	Data acquisition intermittent failure
3/1/20 14:00	3/1/20 18:00	Yes	No	Both A & B sample lines plugged. CEMS contractor rectified the situation and cleaned out the primary and secondary filters.
3/2/20 13:00	3/2/20 16:00	Yes	No	
4/22/20 6:00	4/24/20 13:00	No	Yes	Electric shop changed bottles Nitrogen/sulfur 4/23/2020
4/30/20 16:00	5/6/20 15:00	No	Yes	CEMS contractor replaced failed SO_2 analyzer lamp 5/4/2020

Attachment 2 – Updated Operating Procedure for PAA

RX loading with S02 CEM System offline

Purpose:

To communicate that reactor loading cannot increased while RTO CEM system is not in operation

Safety, Health and Environmental Considerations:

PPE requirements:
Standard PPE - Class B (ANSI Z89.1) hard hat, Safety glasses w/side shields (ANZI Z87), Metatarsal safety boots (minimum six-inch lace type), Long sleeved shirt/pant (cotton work uniform).
Physical Hazards:
Environmental Considerations: Possible SO2 emissions if not followed
Chemical Hazards:
Other:

Accountability:

The PA plant superintendent has the responsibility and authority to ensure this procedure is followed. The tasks may be delegated to qualified personnel as needed.
All employees are responsible for knowing and following this procedure.

Relevant Documents:
SDS Data Base, Kopnet

Procedure

1. Should the RTO CEM System stop functioning properly. Feed rates on the trains cannot be increased.
2. The functions and various errors/alarms can be found in Intellution PAA main control screen in the two areas, “SO2 DATA” & “SO2 CEM CONTROL”. Alarms and failures can be the automated calibration system not completing its cycle, communication errors with the main system or any other various alarm or points out of range.
3. When an alarm or fault occurs, an automated email is sent to the PA production group and the Environmental department. A test email is sent from this system each day at 7AM to make sure it is in operation.

4. When an error or fault email is received by PA superintendent or designated personnel, the PA operator and shift supervisor will be notified that the CEM system is offline and that the feed rate on the effected train(s) cannot be increased. Based on the alarm, this could be one or both trains.
5. The operator or shift supervisor will write on the white board in the control and in the operator logbook that "CEM is down on Y, Max rate of XX". Y= A train, B train or Both trains. XX= the total current loading on each reactor
6. The current max rate must not be exceeded or increased until the CEM system has been corrected and is back online. Rates can be decreased if needed.
7. The only exception to the above max load increase, would be if a situation occurred that would cause a safety or environmental risk, that would be greater than CEM fault. This could a loss of reactor feed stock. possible the loss of steam supplied to the plant, or some other catastrophic failure. Should this occur, reactor feeds must be set by to the designated max loading as soon as the failure is corrected.
8. If purge conditions are satisfied RTO will go through an ignition mode, preheat mode, standby mode and preheat isolation valve mode. Verify retention camber temperature is increasing.

Revision History

Revision Number	Prepared by	Date	Summary of Changes
0	D. Johnston	11/09/2020	Initial issue

Attachment 3 – Pitch Thermal Oxidizer Alarm Conditions

ATTACHMENT 3 - Pitch TO Alarms

Equipment #	Equipment Description	Control Point (if applicable)	Alarm type	Relief and/or trip Points	Alarm Properties	
HS-4800-AUTO	AutoStart			Signal	Interlock	Pitch TO
PI-4847-FAULT	Purge Air Pressure Transmitter Fault		Alarm	Signal	Interlock	Pitch TO
	D Fan On		Interlock	Signal	Interlock	Combustion Fan
FSL-2H71	Oxidizer Min Air Flow Note: pressure switch"PSH" acting as FSL		Interlock	-0.3 " WC	Interlock	Purge
ZSH-4850	Burner Ration Valve High Fire		Interlock	Signal	Interlock	Purge
TI-2H01B	Retention Chamber Temp		HIHI	1625	Interlock	Pitch TO
			HI	1300	Interlock	Process Isolation Valve allowe to open
			LO	1150	Interlock	Process Isolation Valve forced closed
TI-4848	Oxidizer Chamber Temperature		HIHI	1625	Interlock	
			LOLO	300	Interlock	ID Fan Start
TI-4849	Heat Exchanger Outlet Temperature		HIHI	1100	Interlock	Pitch TO
TI-4846	Oxidizer Fume Inlet Temperature		HIHI	350	Interlock	
TI-4850	ID Fan Outlet Temperature		HIHI	625	Interlock	
PI-4847	Inlet Static Pressure		HIHI	-0.4	Interlock	Pitch TO
			LOLO	-0.2	Interlock	ID Fan
			LO	None	Out of range	
			HI	86	Out of range	
ZSH-4845	Oxidizer Fresh Air Damper Open		Interlock	Signal	Interlock	ID Fan Start/ Purge Start
ZSL-4844	Process Isolation Damper Close				Interlock	ID Fan Start/ Purge Start
ZSL-4850	ID-Fan Bleed-In Damper Close		Interlock	Signal	Interlock	Purge
LSH-4851	Fume System #5 Vent Tank High Level Switch	5 sec delay	High Limit Switch	Need Verification in Field	Interlock	Burner
PSL-2873	Combustion Min Air Flow	Local Switch	Interlock	10 "WC	Interlock	Purge
PS-2H55	Gas Pressure	Field set, lo and hi limit switches	HIHI	40 WC"	Interlock	Burner
			LOLO	20 WC"	Interlock	Burner
	Flame Failure Alarm		Interlock	Signal	Interlock	Burner
ZA-4800	Oxidizer Zero Air Flow Shutdown Alarm	Following conditions must come true for alarm to activate: 1) Process Isolation Damper Closed 2)Oxidizer Fresh Air Damper Closed 3) ID fan Bleed-In Air Damper Close There is a 10 second delay	Interlock	Signal	Interlock	Burner

Attachment 4 - Listed Cause and Corrective Actions for SSM Events

Table 1 - Causes and Corrective Action on Pitch Plant Thermal Oxidizer

Date	*Malfunction Cause*	*Corrective Action*
7/1/2019	T.O. tripped due to electrical issue	Resolved by electrician on call out
7/3/2019	TO tripped -cuase unknown	Corrected when TO was brought back on line
8/18/2019	Trip on high oxidizer temperature	WO on 8/19/19 for work around flame arrester; WO on 8/21/2019 to troubleshoot pitch TO fume valve position
8/22/2019	TO tripped -cuase unknown	Corrected when TO was brought back on line
9/24/2019	There was no oxidizer temperature excursion this day, Rather it was a bypass event. There was no pitch production during the bypass duration.	n/a
9/29/2019	Repeated trips on high chamber temperature.	Corrective response includes adjusting vacuum eductor flow valve to smooth out fume load to the T.O.
9/30/2019	Repeated trips on high chamber temperature.	Corrective response includes adjusting vacuum eductor flow valve to smooth out fume load to the T.O.
10/12/2019	Failure of fume valve from steam leak, fume valve is prone to build up	Restored operation to fume valve which was getting stuck. Work order was issued to fix fume valve.
10/13/2019	T.O. tripped on fume static inlet pressure	Resolved by restarting T.O. Corrective response includes periodic/as-needed adjustment of the vacuum eductor flow valve.
10/16/2019	T.O. tripped on fume static inlet pressure	Resolved by restarting T.O.
10/31/2019	T.O. tripped on fume static inlet pressure	Resolved by restarting T.O.
11/1/2019	T.O. tripped on fume static inlet pressure from a steamout activity	Resolved by restarting T.O.
11/5/2019	T.O. tripped on fume static inlet pressure	Resolved by restarting T.O.
12/4/2019	TO tripped -cuase unknown	Corrected when TO was brought back on line
12/17/2019	T.O. tripped on fume static inlet pressure	Resolved by restarting T.O.
12/19/2019	TO tripped -cuase unknown	All systems appearead stable, not recurring.

Table 2 - Causes and Corrective Action on Napthalene Thermal Oxidizer

Date	*TO temp (limit 1436 F)*	*SSM followed*	*Malfunction Cause*	*Corrective Action*
10/10/2019	1416	Yes	Flame sensor could't detect a flame, thermal oxidizer had to shutdown and restart.	Various troubleshooting and adjustments efforts were made on the flame sensor.
10/21/2019	1396	Yes	Scrubber failure due to level controls malfunction shut down TO and a subsequent event due to hot oil overheat. When scrubber fails, the TO shuts down to prevent the scrubber from over heating.	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed
11/3/2019	1425	Yes	Momentary signal failure on pH probe B,	Thermal oxidizer was restart which corrected the problem.
11/7/2019	1326	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
11/9/2019	1422	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
11/23/2019	1108	Yes	Trouble shooting hot oil system- low flow due to leak; also, scrubber blower fan kicking out. Hot oil system has a safety interlock to the TO. When the hot oil system goes down the TO is shutdown. Hot oil level was assumed to be low because oil was cold due to a shutdown. When the oil heats up it expands.	Hot oil level was replenished; scrubber fan maintenance
11/24/2019	1116	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
11/25/2019	1303	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
11/26/2019	1126	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
11/27/2019	1323	Yes	Flame sensor malfunction	Various troubleshooting and adjustments efforts were made on the flame sensor, ultimately a second additional flame sensor was installed to reliably detect the flame stability
12/2/2019	1371	Yes	Hot oil controls were in manual mode. Fan wasn't manually turned on which caused over heating problems.	Additional operating training on the new process. On-screen indicators were added to alert operators the process is in manual mode.
12/11/2019	1416	Yes	Vacuum valve was closed and unit was off	n/a
12/13/2019	1170	Yes	Scrubber failure due to level controls malfunction.	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed
1/2/2020	1299	Yes	TO kicked out on high hot oil temp during start up	General ongoing operating training on the new process
1/3/2020	1422	Yes	Scrubber failure due to level controls malfunction.	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed
1/7/2020	1429	Yes	Scrubber failure due to level controls malfunction.	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed
1/11/2020	1047	Yes	Scrubber failure due to level controls malfunction.	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed
1/23/2020	1243	Yes	Erroneously listed in the Periodic Report - Napthalene Plant was not operating during this period of low temperature and not process gases were routed to the TO.	Setpoint set to low, Koppers engineers began troubleshooting necessary adjustments.
2/6/2020	1382	Yes	Velocity section differential pressure malfunction. Safety issue, have to meet certain differental pressure. Issues meeting high set point. When set point wasn't met, TO was shutdown due to safety interlock.	Setpoint set to low, Koppers engineers began troubleshooting necessary adjustments.

Table 2 - Causes and Corrective Action on Napthalene Thermal Oxidizer

Date	*TO temp (limit 1436 F)*	*SSM followed*	*Malfunction Cause*	*Corrective Action*
2/8/2020	1305	Yes	Velocity section differential pressure malfunction. Safety issue, have to meet certain differental pressure. Issues meeting high set point. When set point wasn't met, TO was shutdown due to safety interlock.	Setpoint set to low, Koppers engineers still troubleshooting necessary adjustments.
2/10/2020	1418	Yes	Velocity section differential pressure malfunction	Design changes accomplished, setpoint lowered to an approprite level to correct the TO tripping
2/14/2020	1413	Yes	Scrubber failure due to level controls malfunction; subsequent event due to hot oil overheat	Scrubber instruments were cleaned; scrubber controls were modified; scrubber was flushed; General ongoing operatraining on the hot oil controls
3/6/2020	1405	Yes	T.O. shut down because hot oil temperature became too hot	Additional operating training on the new process. On-screen indicators were added to alert operators the process is in manual mode.

Table 3 - Causes and Corrective Action on Tar Plant Thermal Oxidizer

Date	*TO temp (limit 1436 F)*	*SSM followed*	*Malfunction Cause*	*Corrective Action*
12/2/2019	1388	Yes	Power outage	Restored unit operation after power supply came back
12/27/2019	1374	Yes	Unit 1 tube-heater loss (during Unit 2 start-up) causing T.O. flame instability during fume system transitions	Lined out the distillation units
1/9/2020	1397	Yes	Flame sensor malfunction.	Flame sensors are maintenanced as needed when repeated failures persist.
1/11/2020	479	Yes	Loss of power to the plant on the morning of 1/11/20 and process units remained down during this period.	Restored unit operation after electrical issues resolved
1/12/2020	92	Yes	Loss of power to the plant on the morning of 1/11/20 and process units remained down during this period.	Restored unit operation after electrical issues resolved
1/13/2020	955	Yes	Loss of power to the plant on the morning of 1/11/20 and process units remained down during this period	Restored unit operation after electrical issues resolved

ATTCHMENT 5 - Naphthalene Cooling Tower Data

Table 1 - Cooling Tower Results (No Return Sample)

Sample Date	Cooling Tower Coolant Makeup		Cooling Tower Supply
	TOC (mg/L)		TOC (mg/L)
4/7/2020	1.9		2.07
4/7/2020	2.12		2.21
4/7/2020	1.92		3.16
5/5/2020	1.58		1.74
5/5/2020	1.69		1.8
5/5/2020	1.54		1.79
6/2/2020	1.66		2.05
6/2/2020	1.71		1.98
6/2/2020	2.25		2.42
7/1/2020	1.56		1.75
7/1/2020	1.7		1.91
7/1/2020	1.6		1.76
8/4/2020	1.73		4.83
8/4/2020	1.75		4.91
8/4/2020	1.73		5.04
9/1/2020	1.64		2.48
9/1/2020	1.6		2.69
9/1/2020	1.62		2.53
10/1/2020	1.9		15.2
10/1/2020	1.93		15.5
10/1/2020	1.86		15.3

Table 2 - Cooling Tower Results (with Return Samples)

Sample Date	Cooling Tower Supply		Cooling Tower Return
10/28/2020	2.86		3.46
10/28/2020	3.05		3.86
10/28/2020	3.45		3.88

Table 3 - Koppers Naphthalene Plant
Heat Exchange System Sampling Calculation Sheet

Enter the cooling tower supply and return TOC concentrations in ppm.

n= 3

Supply			
Sample #	Value (ppm)	Average ($\underline{x}$) (ppm)	Standard Deviation (s)
1	2.860	3.1200	0.3012
2	3.050		
3	3.450		

Return			
Sample #	Value (ppm)	Average ($\underline{x}$) (ppm)	Standard Deviation (s)
1	3.460	3.7333	0.2369
2	3.860		
3	3.880		

Calculations				
Set Δ value (ppm)	10% of mean supply conc. (ppm)	Pooled Variance (s_p)	Sample t (t_s)	Are supply and return conc. statistically different?
1.00	0.3120	0.270955	7.29	Yes

Difference in mean supply and return concentrations (ppm)	Is this difference greater than 1.00 ppm
0.6133	No

Is there a leak?
No

ATTACHMENT 6 – Naphthalene SSM Plan

Koppers, Inc.

Stickney, IL

Startup, Shutdown, and Malfunction Plan – Naphthalene Plant Hazardous Organic NESHAP (HON)

Revision 01

November 2020

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1.0 SCOPE AND PURPOSE

The purpose of this plan is to document a Startup, Shutdown and Malfunction (SSM) Plan for equipment at the Koppers, Inc (Koppers) facility in Stickney, Illinois. Koppers installed a new Naphthalene Plant at Stickney with startup and commissioning scheduled in the fall of 2018 through early 2019. The process is subject to 40 CFR 63 Subpart F, G and H --National Emission Standards For Organic Hazardous Air Pollutants From The Synthetic Organic Chemical Manufacturing Industry also known as the HON MACT. Section 63.102 General Standards of the HON MACT and §63.6(e)(3) of the General Provisions require a facility to develop and implement an SSM Plan to document the procedures for operating equipment during such periods to minimize HAP emissions.

The purpose of the SSM Plan is to:

- Ensure that at all times the process equipment, including air pollution control devices, is operated and maintained in accordance with good air pollution control practices for minimizing emissions.
- Ensure that Koppers is prepared to correct malfunctions as soon as practicable in order to minimize excess emissions.

The SSM Plan summarizes the basic approach to startup, shutdown, and malfunctions as follows:

- Provide general instructions for proper start up or shutdown of equipment or operations while minimizing pollutant emissions.
- Provide the approach for operators to correct malfunctions as soon as possible after their occurrence in order to minimize excess emissions of hazardous air pollutants (HAPs).
- Specify that operators will keep records of:
    - The occurrence, duration, and cause of each malfunction;
    - The occurrence and duration of each startup or shutdown;
    - Whether or not actions taken during a startup, shutdown, or malfunction are consistent with the procedures identified in the SSM Plan.

It should be noted that the occurrence (or even repeated occurrence) of any of the events listed in this plan would not cause Koppers to be out of compliance with the MACT standards provided that the SSM Plan is followed and the events are documented as SSM events. The events included in this plan are those that will have the potential to cause excess emissions from the affected process operations or are malfunctions of the control equipment or monitoring equipment. Excess emissions are those beyond the expected, normal range of emissions from a given emission source.

As a note, 63.103(c)(2) of the HON MACT states that maintaining records of start-up, shutdown and malfunction and continuous monitoring system calibration and maintenance is not required for Group 2 emissions points, unless those emission points are used in an emissions average. Therefore, these SSM Plan provisions are applicable to the Group 1 Naphthalene Plant process vents vented to the recuperative thermal oxidizer (TO-5) and the Group 1 storage tanks listed in Table 1.

Table 1 Storage Tank Group Determination

Equipment ID	Tank Name	Capacity (gal)	Capacity (m3)	Max True Vapor Pressure of Total HAP (kPa)	Group Status
T649	Material Storage 1	587478	2224	1.983	Group 1
T650	Material Storage 2	587478	2224	1.983	Group 1
T651	Material Storage 3	587478	2224	1.983	Group 1
T662	Material Storage 4	259078	981	0.048	Group 2
T663	Material Storage 5	259078	981	0.048	Group 2
T667	Light Oil Storage Tank 1	75197	285	5.11	Group 1
T664	Methyl Naphthalene Tank	24821	94	0.23	Group 2
T665	Off Spec Naphthalene Tank	56398	213	2.47	Group 1
T660	Solvent Storage Tank 1	75197	285	0.20	Group 2
T654	Intermediate Storage Tank 1	132183	500	1.81	Group 1

References:

40 CFR Part 63, Subpart F, G and H National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry collectively known as the *(HON) 40 CFR 63.6 (e)(3)*

2.0 *DEFINITIONS*

The definitions for startup, shutdown, and malfunction as they are applied in the HON MACT, codified in §63.101 are as follows:

Initial Startup:

- Initial start-up means the first time a new or reconstructed source begins production, or, for equipment added or changed as described in §63.100(l) or (m) of this subpart, the first time the equipment is put into operation. Initial start-up does not include operation solely for testing equipment. For purposes of subpart G of this part, initial start-up does not include subsequent start-ups (as defined in this section) of chemical manufacturing process units following malfunctions or shutdowns or following changes in product for flexible operation units or following recharging of equipment in batch operation. For purposes of subpart H of this part, initial start-up does not include subsequent start-ups (as defined in §63.161 of subpart H of this part) of process units following malfunctions or process unit shutdowns (Start-up at §63.161 means the setting in operation of a piece of equipment or a control device that is subject to this subpart).

Startup:

- Start-up means the setting into operation of a chemical manufacturing process unit or a reactor, air oxidation reactor, distillation unit, waste management unit, or equipment required or used to comply with this subpart F, subpart G, or H of this part or a storage vessel after emptying and degassing. Start-up includes initial start-up, operation solely for testing equipment, the recharging of equipment in batch operation, and transitional conditions due to changes in product for flexible operation units.

Shutdown:

- Shutdown means for purposes including, but not limited to, periodic maintenance, replacement of equipment, or repair, the cessation of operation of a chemical manufacturing process unit or a reactor, air oxidation reactor, distillation unit, waste management unit, equipment required or used to comply with this subpart F, subparts G, or H of this part or the emptying and degassing of a storage vessel. Shutdown does not include the routine rinsing or washing of equipment in batch operation between batches.

Malfunction:

The HON does not specifically define "malfunction", but from the MACT General Provisions rule (§63.2) the definition is:

- Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, emissions monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded. Failures caused all or in part by poor maintenance or careless operation are not malfunctions.

Maintenance Wastewater:

- Wastewater generated by the draining of process fluid from components in the chemical manufacturing process unit into an individual drain system prior to or during maintenance activities. Maintenance wastewater can be generated during planned and unplanned shutdowns and during periods not associated with a shutdown. Examples of activities that can generate maintenance wastewaters include descaling of heat exchanger tubing bundles, cleaning of distillation column traps, draining of low legs and high point bleeds, draining of pumps into an individual drain system, and draining of portions of the chemical manufacturing process unit for repair.

References:

40 CFR Part 63, Subpart F & H National Emission Standards for Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry
40 CFR 63.1012 Definitions
40 CFR 63.6 (e)(3)

3.0 PROCEDURES

Organic HAP emissions from the various distillation columns in the Naphthalene Plant are controlled by a thermal oxidizer (TO-5) as are the truck transfer racks used for receiving raw materials and shipping out product. HAP emissions from storage vessels, the wastewater treatment tank and railcar transfer racks are controlled by an existing thermal oxidizer at the Tar Plant (TO 1-4). The Phthalic Anhydride Plant is also subject to the HON and operates under a separate SSM Plan.

3.1 SSM PLAN FOR THE NAPHTHALENE PROCESS

This plan will be used during a startup, shutdown, or malfunction event as defined in Section 2.0. If an SSM event occurs, the operating procedures, as well as the recordkeeping and reporting requirements outlined in this SSM Plan will be followed to ensure compliance with the HON MACT. The emission limitations of the HON MACT do not apply during SSM events if this SSM Plan is followed. However, if the source is subject to additional federal or state notifications, the reporting or recordkeeping requirements of those regulations still apply.

3.1.1 STARTUP

3.1.1.1 Process Startup

Prior to starting up the Naphthalene Plant the operator(s) will confirm that the thermal oxidizer is operational, that vent lines are open to these units and the vent to the stack (XV-3671B) is closed. Column startup procedures will then be followed. The vent valves to the TO (XV_1H50 and XV_3671A) and the vacuum pump suction valve (XV_3623C) are to remain closed, the vacuum pumps (P-623A & B) are to remain off and the acid washer is to remain down until the thermal oxidizer is running and lined up as described below.

3.1.1.2 Thermal Oxidizer Startup

The Thermal Oxidizer start-up is automated. The start-up procedure is as follows:

- Clear all thermal oxidizer startup permissives.
- Ensure the vent valves to the thermal oxidizer (XV-3671A and XV-1H50) are closed and the vent valve (XV-3671B) to atmosphere is open.
- Ensure the thermal oxidizer is lined up to the stack.

- Open the TOx Controls panel and click the button to start the oxidizer. This will initiate the automated purge and startup sequence.
- Ensure the thermal oxidizer reaches its operating temperature above 760°C (1400°F).
- Switch the thermal oxidizer line up to the scrubber.
- Click the button to start purging vent header. This will open one vent valve to the oxidizer (XV_1H50) and close the vent valve to atmosphere. The TO is now operating and lined up. The process can be started.

3.1.2 SHUTDOWN

3.1.2.1 Process Shutdown

Operators will follow shutdown procedures whenever taking the naphthalene plant off-line. During the shutdown, the thermal oxidizer will control all organic emissions. The thermal oxidizer must be running until the vent valves to the TO (XV_1H50 and XV_3671A) and the vacuum pump suction valve (XV_3623C) are closed, the vacuum pumps (P-623A & B) are off and the acid washer is shut down.

3.1.2.2 Thermal Oxidizer Shutdown

Prior to initiating shutdown of the thermal oxidizer the operators will ensure that all process vents are closed, the vacuum pumps are shut down and the acid washer is off line as described above. Once initiated the shutdown is automated. To initiate thermal oxidizer shutdown:

- Open the TOx Controls window and navigate to the shutdown page
- Click the "Press to Stop Oxidizer" button. The TO will then automatically proceed through its shutdown sequence.

3.1.3 MALFUNCTIONS

3.1.3.1 Process Malfunctions

Most process malfunctions will not result in excessive air emissions.

- In case of process malfunctions that do not include a leak or rupture of piping or equipment or release of pressure safety valves all emissions will be controlled by the thermal oxidizer. Troubleshooting and restoration of normal operation can be completed while venting to the thermal oxidizer.

- In case of process malfunctions that do include a leak or rupture of piping or equipment or release of pressure safety valves, immediately shut down all pumps and heat sources and call a manager.

3.1.3.2 Thermal Oxidizer Malfunctions

If the thermal oxidizer malfunctions process vents will automatically be redirected to the atmosphere. In this case, the operator must:

- Determine whether the TO can be put back in operation without delay
- If the TO can be put back in operation, the operator should restart if necessary and line up the process vent.
- If the TO operation cannot be reestablished following the corrective action, the operator should reduce heat on V-640 to one burner on low fire and proceed with process shutdown beginning with shutting down the vacuum pump and closing the vacuum pump suction valve.

3.1.4 MONITORING DEVICES

The thermal oxidizer controls the Naphthalene Plant processes. The oxidizer controls the vents off the processes in order to achieve the process control necessary for HAPs under the HON MACT. In order to demonstrate that the thermal oxidizer is operating correctly, the facility must continuously monitor the oxidizer combustion chamber temperature to ensure that a minimum temperature of 1400° F (760°C) is achieved.

To reduce the risk of monitoring device malfunctions, Koppers will do the following:

- Calibrate the thermocouple on the routine schedule recommended by the instrument manufacturers, but no less than once per year.
- Perform the routine sensor maintenance specified by the manufacturer.

In the event that the monitoring device is observed to malfunction, the operator will notify maintenance to troubleshoot the malfunction and repair/replace the device as necessary.

Table 2 Potential Malfunctions

Malfunction	Corrective Action
General Malfunction	Determine cause of malfunction and take appropriate measures to restore malfunctioning equipment to normal operation, if possible.
Failed thermocouple	The Naphthalene Plant process and thermal oxidizer must be shutdown. Determine the cause of malfunction and take appropriate measures to restore the monitor to normal operation.

3.2 SSM PLAN FOR GROUP 1 STORAGE VESSELS

This plan is used during a startup, shutdown, or malfunction event as defined in Section 2.0 for the Group 1 storage vessels listed in Table 1-1.

If an SSM event occurs, the operating procedures, as well as the recordkeeping and reporting requirements outlined in this SSM Plan will be followed to ensure compliance with the HON MACT. The thermal oxidizer TO 1-4 at the Tar Plant controls the HAP emissions from storage vessels at the Naphthalene Plant. TO 1-4 is already subject to the HON MACT and startup and shutdown procedures are consistent with that SSM Plan.

3.2.1 STARTUP

3.2.1.1 Process Startup

Prior to sending material to the storage vessels, the operator(s) will confirm that the thermal oxidizer TO 1-4 is operational and V4749, the valve from the vent scrubber to the thermal oxidizer, is open.

1. Truck offloading into T-658
2. RCO flow into T-649 or T-650
3. RCO flow into V-601
4. AFO flow into T-654
5. AFO flow into V-610
6. Dehydrator Oil flow into V-667
7. Solvent flow into V-660
8. Naphthalene flow into T-7 or T-665

9. NSR flow into T-662 or T-663
10. Methylnaphthalene flow into T-664
11. Spent carbonate flow into T-678

3.2.1.2 Thermal Oxidizer Startup

Refer to the tar plant SSM Plan for the TO startup procedures.

3.2.2 *THERMAL OXIDIZER SHUTDOWN*

Prior to shutting down the thermal oxidizer the following process flows must be discontinued:

1. Truck offloading into T-658
2. RCO flow into T-649 and T-650
3. RCO flow into V-601
4. AFO flow into T-654
5. AFO flow into V-610
6. Dehydrator Oil flow into V-667
7. Solvent flow into V-660
8. Naphthalene flow into T-7 and T-665
9. NSR flow into T-662 and T-663
10. Methylnaphthalene flow into T-664
11. Spent carbonate flow into T-678

Refer to the tar plant SSM Plan for the TO shutdown procedure.

3.2.3 *MALFUNCTIONS*

Refer to the tar plant SSM plan for malfunction procedures for the tar thermal oxidizer. In the case of a malfunction that lasts more than 3 hours, the shutdown procedure above must be completed.

3.2.4 *MONITORING DEVICES*

The thermal oxidizer TO 1-4 controls the storage vessels. The oxidizer controls HAP emissions as necessary under the HON MACT. In order to demonstrate that the thermal oxidizer is operating correctly, the facility must continuously monitor the oxidizer combustion chamber temperature to ensure that a minimum temperature of 1400° F (or temperature established during the stack testing) is achieved.

To reduce the risk of monitoring device malfunctions, Koppers will do the following:

- Calibrate the thermocouple on the routine schedule recommended by the instrument manufacturers.
- Perform the routine sensor maintenance specified by the manufacturer.

In the event that the monitoring device is observed to malfunction, the operator will cease operations. Once the oxidizer is shutdown, troubleshoot the malfunction and repair/replace the device as necessary.

Malfunction	Corrective Action
General Malfunction	Determine cause of malfunction and take appropriate measures to restore malfunctioning equipment to normal operation, if possible.
Failed thermocouple	Cease operations. Determine the cause of malfunction and take appropriate measures to restore the monitor to normal operation.

3.4 *MAINTENANCE WASTEWATER*

This section describes the maintenance procedures for management of wastewaters generated from the emptying and purging of equipment in the process during temporary shutdowns for inspections, maintenance, and repair (i.e., a maintenance-turnaround) and during periods which are not shutdowns (i.e., routine maintenance).

Maintenance wastewater can be generated during cleaning operations of various equipment in the Naphthalene Plant. This generally consists of emptying process fluids from lines and equipment, wash-outs, and boil-outs.

The maintenance procedures for wastewater specify the:

- Types of process equipment or maintenance tasks that are anticipated to create wastewater during maintenance activities;
- Procedures that will be followed to properly manage the wastewater and control organic HAP emissions to the atmosphere; and

- Procedures to be followed when clearing materials from process equipment [§63.105].

3.4.1 MANAGEMENT GUIDELINES FOR MAINTENANCE WASTEWATERS

Maintenance wastewaters can be generated from any piece of equipment throughout the HON MACT affected processes.

In addition to general maintenance provisions, the following procedural guidelines are intended to minimize HAP emissions to the atmosphere during clearing for maintenance activities that generate wastewater.

Equipment, Vessel Piping Drains:

- Process fluids will be drained to the industrial sewer, if practicable.
- After initial draining of process fluids, equipment may be flushed with water and/or steamed to the industrial sewer. Accumulated condensate from steaming process vessels may be drained or flushed to the industrial sewer.

Heat Exchangers/Reboilers:

- Process fluids will be transferred out of the exchanger to a storage tank, back to the process, or
- Volatile materials may be removed by steaming to the industrial sewer or flushing with clean water to the industrial sewer.

Pumps and Filter Housing Contents:

- Pump contents may be purged back into the process, or drained to the industrial sewer via hard-pipe connection or hose to reclaim material to the extent practicable.
- If pump contents are drained to grade, they should be flushed with water to the industrial sewer.

Storage Tanks:

- Tank contents will be transferred to another tank if practicable in order to maximize material recovery.
- Tanks may be drained to the industrial sewer via hard-pipe connection or hose.
- After initial draining of process fluids, vessels may be flushed with water to the industrial sewer, frac tank, or other container.

- Accumulated condensate from steaming process vessels may be stored in appropriate storage vessels.

Instrumentation/Control Valve Loop:

- Instrumentation or control valve loops will be drained/purged into the process system, to the extent practicable, or collected in containers for returned to the industrial sewer as appropriate to minimize emissions.

4.0 RECORDKEEPING

4.1 GENERAL RECORDS

A copy of the current SSM Plan and any superseded versions will be maintained at the facility for a period of 5 years following each revision to the SSM Plan. The current version will be maintained at the site for at least 5 years after the life of the affected source or until the affected source is no longer subject to the HON MACT. The Environmental Department will approve any revisions to the SSM Plan, or to procedures contained in it, before they are incorporated into a revision of the document.

For each startup, shutdown, or malfunction incident that results in excess emissions, information necessary to demonstrate compliance with the provisions presented in this SSM Plan will be documented. General recordkeeping for SSM events is addressed in 40 CFR 63.103(c)(2) through (c)(3) and 63.152(d)(1).

Documentation of the SSM events will take the form of a "checklists" that confirms conformance with the startup, shutdown, and malfunction plan and describes the actions taken for that event. Figures 1, 2, 3 and 4 provide flow diagrams of the forms to complete and actions to take for SSM events.

Checklists are provided as part of this plan as Form #1 for the continuous monitoring system (CMS) serving the thermal oxidizer (TO-5) and Form #2 for the Naphthalene Plant process. The checklists, or their electronically-maintained equivalents, will serve as the records documenting the occurrence and duration of malfunctions of the monitoring system and each startup, shutdown, or malfunction of operation and each malfunction of air pollution control equipment.

Files of these records will be kept readily available for inspection and review. Any SSM event shall be reported to the Environmental Department for subsequent review of the details to ensure that the SSM Plan was followed and any required reporting to the EPA is addressed.

Any actions taken during an SSM event that are consistent with this SSM Plan will be recorded in order to demonstrate that the procedures specified in this document were followed. This is fulfilled by using the SSM Checklist provided as Form #1 and Form #2. Repairs will be tracked using existing facility programs to document scheduled and actual repair dates and the status of specific repairs.

Any actions taken during an SSM event that potentially are not consistent with the procedures specified in this SSM Plan will be recorded using the Form #3. This form must be completed immediately following the event.

For each startup, shutdown, or malfunction, information necessary to demonstrate compliance with the provisions presented in this SSM Plan shall be documented. The required information includes:

- Occurrence and duration of each startup, shutdown, or malfunction of process operations or air pollution control equipment.
- Occurrence and duration of each malfunction of continuous monitoring systems.
- When excess emissions occur, were the procedures in the SSM Plan followed and, if not, then what actions were taken to respond to the SSM event.

Information related to the startup, shutdown or malfunction of the HON MACT affected units will be recorded on Form #1 and #2. If the actions taken are not consistent with the SSM Plan or the event is not identified in the SSM Plan, so note when completing Form #3.

4.2 *RECORDKEEPING FOR MALFUNCTIONS OF THE CONTINUOUS MONITORING SYSTEM (CMS)*

Malfunctions of the continuous monitoring system that records the thermal oxidizer temperatures are covered on Form #3. The required information includes:

- The date and time identifying each period that the CMS was inoperative;
- The nature and cause of any malfunction (if known);
- The corrective action taken or preventive measures adopted;
- The nature of repairs or adjustments to the CMS; and
- Indication if the SSM Plan was followed when dealing with the malfunctioning CMS.

5.0 *REPORTING*

5.1 *COMPLIANCE REPORTS*

Six-Month Reporting:

The HON MACT require that SSM reports be developed as specified at 40 CFR 63.10(d)(5)(i) and submitted with the semi-annual Periodic Report. The report will contain information describing how the actions taken during the SSM event were consistent with the SSM Plan, or documentation of actions taken that are not consistent with the SSM Plan and include a brief description of each malfunction.

Immediate SSM Reports:

Any time an action taken during a startup or shutdown that caused the source to exceed any applicable emission limitation, or malfunction (including actions taken to correct a malfunction) is not consistent with the procedures specified in this SSM plan, Koppers shall report the actions taken for that event within 2 working days after commencing actions inconsistent with the plan followed by a letter within 7 working days after the end of the event.

The immediate report shall consist of a telephone call (or facsimile (FAX) transmission) to the Illinois EPA (Administrator) within 2 working days after commencing actions inconsistent with the plan. This call shall be followed by a letter, delivered or postmarked within 7 working days after the end of the event.

The report is to contain:

- the name, title, and signature of the owner or operator or other responsible official who is certifying its accuracy,
- explanation of the circumstances of the event,
- the reasons for not following the startup, shutdown, and malfunction plan,
- a description of all excess emissions and/or parameter monitoring exceedances which are believed to have occurred (or could have occurred in the case of malfunctions), and
- actions taken to minimize emissions.

5.2 *STATE RECORDKEEPING AND REPORTING*

In addition to the federal SSM reporting requirements of the HON MACT, Illinois EPA has reporting requirements for equipment malfunctions with which the facility must comply. The reader is directed to the recordkeeping and reporting requirements of the Air Construction Permit in Conditions 2.1.8.e and 2.4.8.c.

6.0 RESPONSIBILITIES

The Environmental Manager will be responsible for reviewing the SSM events and notifying the appropriate authorities, if necessary.

7.0 REVISIONS TO THE PLAN AND RECORDS RETENTION REQUIREMENTS

The Environmental Manager will, for each SSM event, review the actions taken in response to the event and the details provided in the forms to determine whether the procedures identified in the SSM Plan were followed. The Environmental Manager will also determine if the SSM Plan was adequate for the event. If the SSM Plan was not adequate to cover the event, the Plan shall be revised. When evaluating the SSM Plan, the following criteria shall be considered:

- addresses how excess emissions are to be managed for typical startup, shutdown, or malfunction events;
- provides for the operation of equipment during SSM events in a manner consistent with good engineering and air pollution control practices for minimizing emissions; and
- provides adequate steps for correcting malfunctioning air pollution control equipment as quickly as practical.

If the SSM Plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the plan shall be revised within 45 days of the event to include procedures for similar malfunction events (40 CFR §63.6(e)(3)(viii)). Form #4 is provided in this plan to track revisions to the plan.

The current and any superseded SSM Plans shall be maintained on-site as specified in §63.6(e)(3)(v). §63.6(e)(3)(v) requires that superseded plans remain at the facility for a period of 5 years following their revision.

Figure 1 - SSM Event Documentation Flow Charts

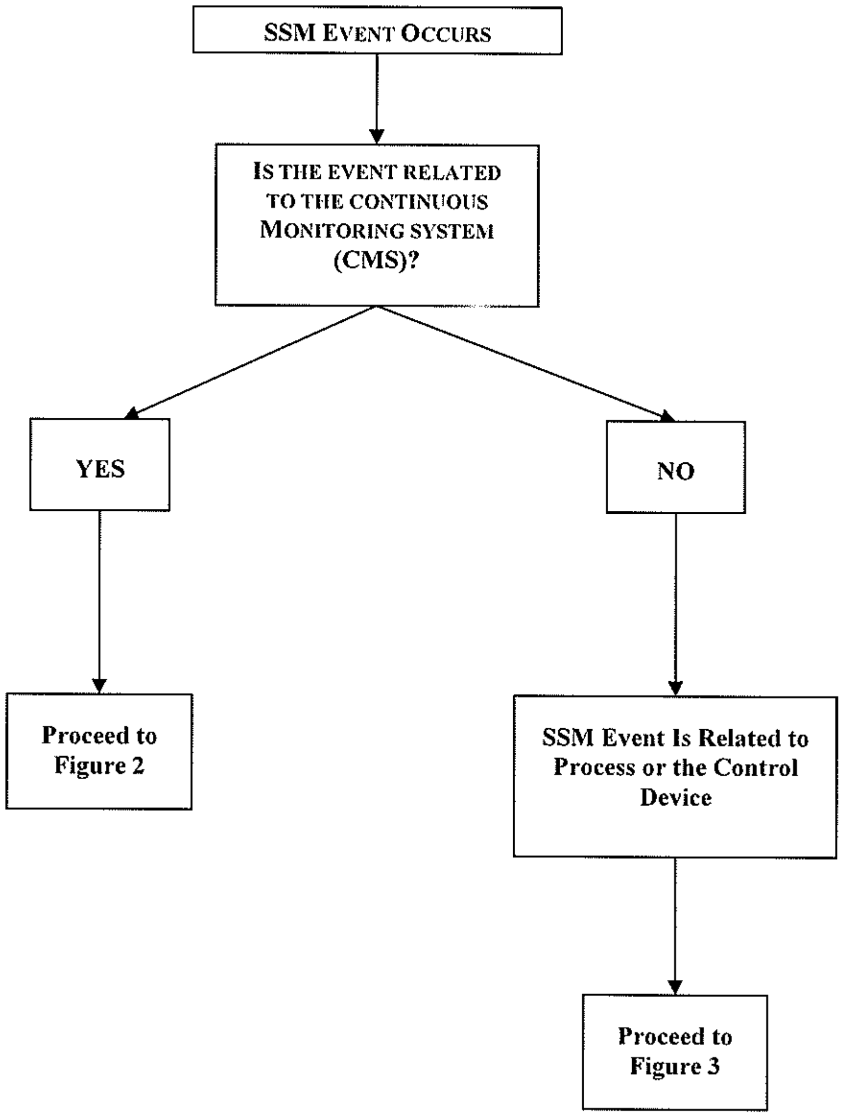


Figure 2 – SSM Event with Monitoring System (CMS)

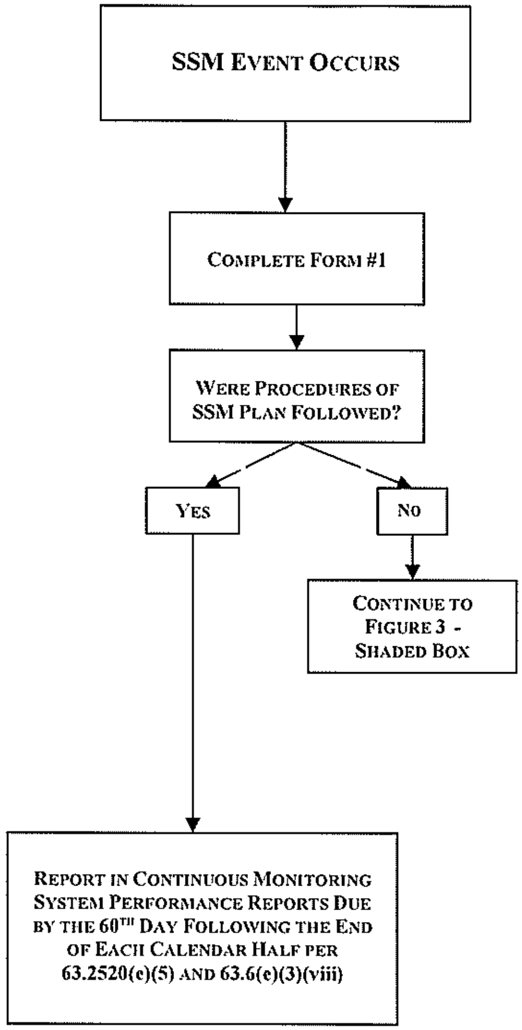


Figure 3
SSM Event for Chemical Processes and Air Pollution Control Devices

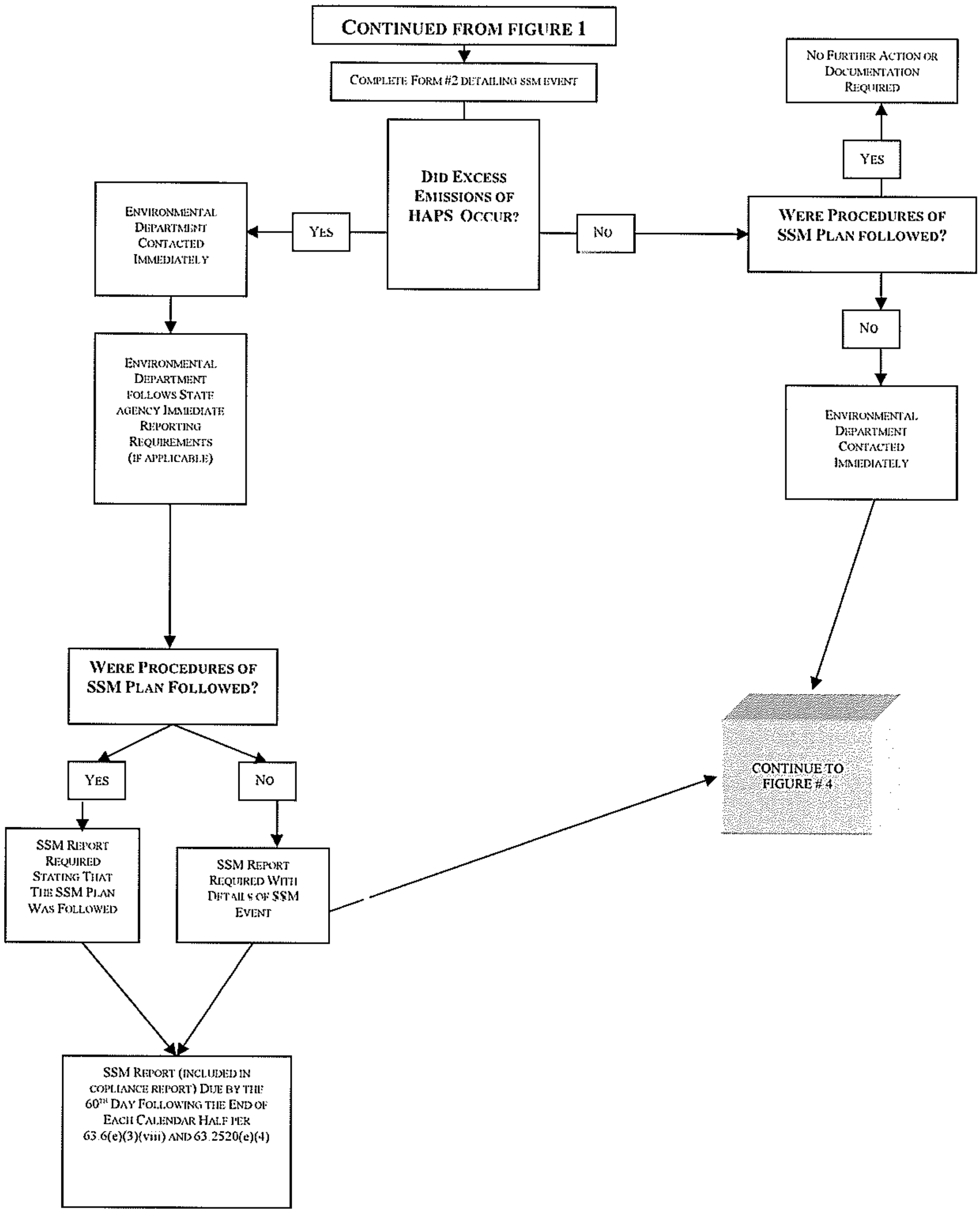
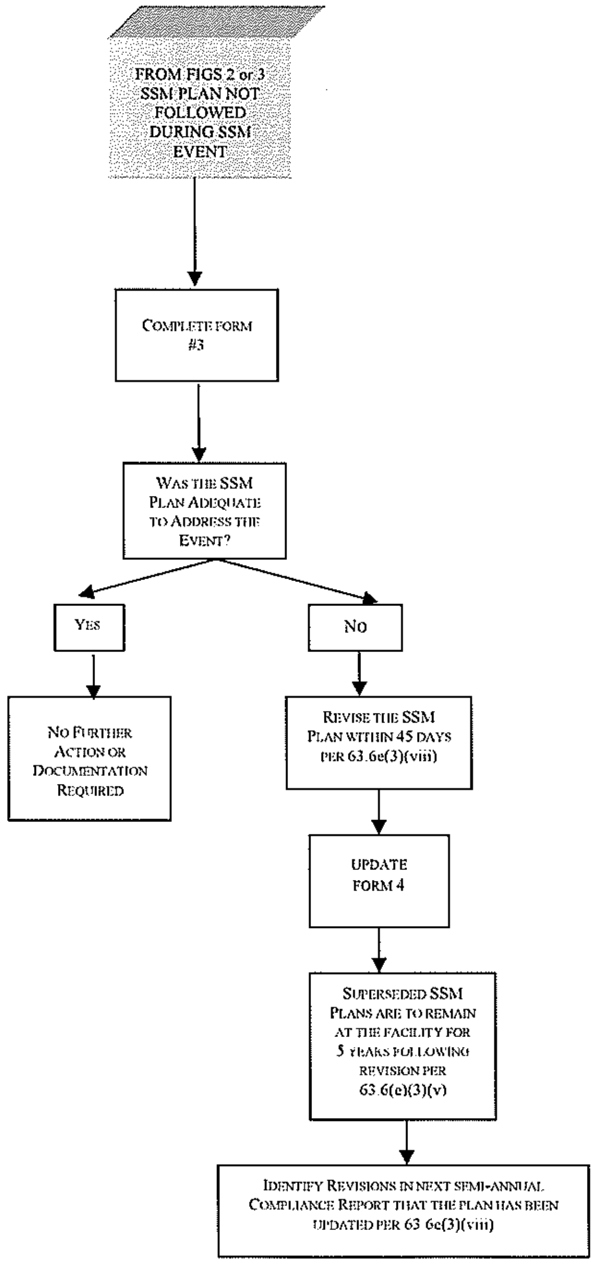


Figure 4
SSM Event Documentation When SSM Plan Was Not Followed



FORM # 1 - MONITORING SYSTEM (CMS) -MALFUNCTION CHECKLIST & LOG

Activity (circle one)	**Date/Time Activity Starts**	**Date/Time Activity Ends**	**Nature and Cause of Malfunction**	**Describe Corrective actions taken, including repairs or adjustments to monitoring system**	**SSM Plan Followed?**
Inoperative QA/QC Calibration Other Cause					Yes / No
	<u>Env. Dpt. Only</u> Duration (Hours/Minutes)				
Inoperative QA/QC Calibration Other Cause					Yes / No
	<u>Env. Dpt. Only</u> Duration (Hours/Minutes)				
Inoperative QA/QC Calibration Other Cause					Yes / No
	<u>Env. Dpt. Only</u> Duration (Hours/Minutes)				

FORM # 2 - STARTUP, SHUTDOWN AND MALFUNCTION CHECKLIST & LOG

Page ____ of ____

Activity (circle one)	Date/Time Activity Starts	Date/Time Activity Ends	If Malfunction, What Was Cause and Corrective Action?	SSM Plan Followed?	Form 3 Required? (Note 1)	For Env. Dept. Use Only Duration Hours/Minutes
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	

Notes:

1. Form 3 required if the following occurred: Startup, Shutdown or Malfunction occurred and SSM Plan was not followed.

FORM #3 - SSM EVENT REPORT

Identify the Area of the Event: **Process__________ Control Device________________**

Date: ____________ Shift: ____________ Name: __________________________

Event being reported:

Start Up ____________ Shutdown ____________________ Malfunction___________________

Please give a brief description of the event and corrective actions taken:

____

____

____

____

____

Time Event started: ____________ (Date, Hour, Minute)_ Time Event ended:________________ (Date, Hour, Minute)

Please describe in detail why the plan was not followed:

____

____

____

____

____

THESE FORMS MUST BE FORWARDED TO THE ENVIRONMENTAL MANAGER AFTER EACH OCCURRENCE

FORM 4 - SSM PLAN REVIEW & REVISION LOG

Date	Revision #	Action Taken	Initials
10/2019	00	Original document	
11/2020	01	Update recordkeeping to include use of the electronic SSM system.	CP
	02		
	03		

ATTACHMENT 7 – Tar SSM Plan

REVISED REPORT

Koppers, Inc.

Stickney, IL

Startup, Shutdown, and Malfunction Plan

Revision 03

November 2020

Environmental Resources Management
700 W. Virginia Street, Ste. 601
Milwaukee, WI 53204
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TABLE OF CONTENTS

1.0 SCOPE AND PURPOSE

The purpose of this plan is to document a Startup, Shutdown and Malfunction (SSM) Plan for equipment at the Koppers, Inc (Koppers) facility in Stickney, Illinois. The Crude Tar Distillation process, the Modified Pavement Sealer Base process and the Type A Carbon Pitch Tanks within the Koppers facility are subject to the National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing (MON MACT), 40 CFR Part 63, Subpart FFFF. Section 63.2540 of the MON MACT requires a facility to develop and implement an SSM Plan to document the procedures for operating equipment during such periods to minimize HAP emissions.

As a note, 63.2525(j) of the MON MACT states that an SSM Plan is not required for Group 2 emissions points, unless those emission points are used in an emissions average. While subject to the MON MACT, the Modified Pavement Sealer Base process has no Group 1 emission points as defined in the MON MACT nor emission points used in emissions averaging. Therefore, no SSM Plan content is required for this process.

The purpose of the SSM Plan is to:

- Ensure that at all times the process equipment, including air pollution control devices, is operated and maintained in accordance with good air pollution control practices for minimizing emissions.
- Ensure that Koppers is prepared to correct malfunctions as soon as practicable in order to minimize excess emissions.

The SSM Plan summarizes the basic approach to startup, shutdown, and malfunctions as follows:

- Provide general instructions for proper start up or shutdown of equipment or operations while minimizing pollutant emissions.
- Provide the approach for operators to correct malfunctions as soon as possible after their occurrence in order to minimize excess emissions of hazardous air pollutants (HAPs).
- Specify that operators will keep records of:
    - The occurrence, duration, and cause of each malfunction;
    - The occurrence and duration of each startup or shutdown;
    - Whether or not actions taken during a startup, shutdown, or malfunction are consistent with the procedures identified in the SSM Plan.

It should be noted that the occurrence (or even repeated occurrence) of any of the events listed in this plan would not cause Koppers to be out of compliance with the MACT Standards provided that the SSM Plan is followed and the events are documented as SSM events. The events included in this plan are those that will have the potential to cause excess emissions from the affected process operations or are malfunctions of the control equipment or monitoring equipment. Excess emissions are those beyond the expected, normal range of emissions from a given emission source.

This SSM Plan is effective immediately.

References:

40 CFR Part 63, Subpart FFFF, National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing (MON)
40 CFR 63.2540 Table 12
40 CFR 63.6 (e)(3)

2.0 DEFINITIONS

The definitions for startup, shutdown, and malfunction as they are applied in MON MACT, codified in §63.2550 are as follows:

Startup means:

- The setting in operation of a continuous operation for any purpose.
- The first time a new or reconstructed batch operation begins production.
- For new equipment added, including equipment required or used to comply with this subpart, the first time the equipment is put into operation; or for the introduction of a new product/process, the first time the product or process is run in equipment.
- For batch operations, startup applies to the first time the equipment is put into operation at the start of a campaign to produce a product that has been produced in the past if the steps taken to begin production differ from those specified in a standard batch or nonstandard batch.
- Startup does not apply when the equipment is put into operation as part of a batch within a campaign when the steps taken are routine operations.

Shutdown means:

- The cessation of operation of a continuous operation for any purpose.
- The cessation of a batch operation, or any related individual piece of equipment required or used to comply with this subpart, if the steps taken to cease operation differ from those described in a standard batch or nonstandard batch.
- Shutdown also applies to emptying and degassing storage vessels.
- Shutdown does not apply to cessation of batch operations at the end of a campaign or between batches within a campaign when the steps taken are routine operations.

Malfunction means:

- Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, emissions monitoring equipment, process equipment, or a process to operate in a normal or usual manner which causes, or has the potential to cause, the emission limitations in an applicable standard to be exceeded.

- Failures caused all or in part by poor maintenance or careless operation are not malfunctions.

Maintenance wastewater means:

- Wastewater generated by the draining of process fluid from components in the MON MACT affected process into an individual drain system in preparation for or during maintenance activities.

- Maintenance wastewater can be generated during planned and unplanned shutdowns and during periods not associated with a shutdown.

- Examples of activities that can generate maintenance wastewater include descaling of heat exchanger tubing bundles, cleaning of distillation column traps, draining of pumps into an individual drain system, and draining of portions of the MON MACT affected process for repair.

- Wastewater from routine cleaning operations occurring as part of batch operations is not considered maintenance wastewater.

References:

40 CFR Part 63, Subpart FFFF, National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing (MON)
40 CFR 63.2540 Table 12
40 CFR 63.6 (e)(3)

3.0 PROCEDURES

3.1 SSM PLAN FOR CRUDE TAR DISTILLATION PROCESS

In the Crude Tar Distillation process, this plan will be used during a startup, shutdown, or malfunction event as defined in Section 2.0. If an SSM event occurs, the operating procedures, as well as the recordkeeping and reporting requirements outlined in this SSM Plan will be followed to ensure compliance with the MON MACT. The emission limitations of the MON MACT do not apply during SSM events if this SSM Plan is followed. However, if the source is subject to additional federal or state regulations, the reporting or recordkeeping requirements of those regulations still apply.

The Crude Tar Distillation process emissions are typically combusted in Tube Heaters 1 and 2, which utilize the fuel value of the vapors. As stated in 40 CFR 63.2550(i), a gas stream transferred for fuel value is exempt from the MON definition of a continuous process vent by the exemption in 63.107(h)(6), as referenced in 63.2550(i). Accordingly, Koppers considers the combined vent from the Crude Tar Distillation process subject to Group 1 continuous process vent requirements only when the Tube Heater(s) are not available to burn the gases as fuel. Therefore, the miscellaneous organic chemical manufacturing process unit (MCPU) for the Crude Tar Distillation process ends at the tube heaters.

When the tube heaters are not available, the process gases are routed through Fume System #2 to the #2 Fume Scrubber, then to the atmosphere. The #2 Fume Scrubber provides some level of control until the tube heaters are brought back on line or the distillation process is shut down.

3.1.1 Startup

3.1.1.1 Process Startup

Prior to starting up the Crude Tar Distillation Column, the operator(s) will confirm that the tube heaters are operational, and that vent lines are open to these units. Automated column startup procedures will then be followed.

3.1.2 Shutdown

3.1.2.1 Column Shutdown

Column operators will follow automated shutdown procedures whenever taking the column off-line. During the shutdown, all emissions will be controlled by the tube heaters.

3.1.3 *Malfunctions*

In the event of a malfunction that impacts the operation of the Crude Tar Distillation process or the tube heaters results in emissions being discharged to Fume System #2/Fume Scrubber #2, then directly to the atmosphere, the operator must begin the emergency shutdown procedures to put the equipment into "safe mode" (i.e. no venting). After "safe mode" is achieved, the Supervisor will determine the cause of the malfunction and identify the necessary corrective actions. During a malfunction shutdown, the plant will minimize HAP emissions by one of the following methods:

- Vent emissions to the tube heaters, provided these units are operational;
- Route emissions through the #2 Fume System to the #2 Fume Scrubber.

If relief valves are blown in the process, this material is automatically routed to Tank 75. Recovered material from this vessel is held until it can be recycled back into the Crude Tar Distillation Column when the process becomes operational.

In the event of a malfunction that does not impact the operation of the Crude Tar Distillation process nor results in emissions being discharged directly to the atmosphere, the operator can continue to operate the process. The cause of the malfunction will be determined and the appropriate corrective action will be taken in order to restore the process to normal operating conditions. If the equipment cannot be restored in a timely manner, the process may be shut down to repair malfunctioning equipment.

3.1.4 *Monitoring Devices*

The Crude Tar Distillation process routes the process vent gases to Tube Heaters 1 and 2, which utilize the gases as fuel. Therefore, there is no affected air pollution control device nor parametric monitoring device.

3.2 *SSM PLAN FOR TYPE A CARBON PITCH TANKS*

For the Type A Carbon Pitch Tanks (TK-41, TK-47, TK-48, TK-44, TK-46) this plan will be used during a startup, shutdown, or malfunction event as defined in Section 2.0. If an SSM event occurs, the operating procedures, as well as the recordkeeping and reporting requirements outlined in this SSM Plan will be followed to ensure compliance with the MON MACT. The emission limitations of the MON MACT do not apply during SSM events if this SSM Plan is followed. However, if the source is subject to additional federal or state regulations, the reporting or recordkeeping requirements of those regulations still apply.

The Type A Carbon Pitch Tanks are used as both storage tanks and process tanks. Koppers will charge materials into the tanks and blend to produce the final product which is stored in the same tank. During the charging and blending operations, these vessels are considered Group 1 Batch Process Vents. These vents are collected by Fume System #5 and controlled by the Pitch Thermal Oxidizer (Pitch TO). When the product is being stored, these are Group 2 Storage Tanks. There are no SSM requirements for Group 2 Storage Tanks.

3.2.1 *Startup*

3.2.1.1 Process Startup

Prior to blending materials in the Type A Carbon Pitch Tanks (TK-41, TK-47, TK-48, TK-44, TK-46) the operator(s) will confirm that the Pitch TO and #5 Fume System Scrubber are operational.

3.2.1.2 Thermal Oxidizer Startup

The Pitch TO start-up is primarily computer controlled. The start-up procedure is as follows:

- Make sure manual isolation valves for utilities (natural gas, instrument air, nitrogen, steam, and condensate) are in correct position. Confirm instrument air supply.
- Start control power selector and verify all instruments are powered.
- The safety shutdown interlocks must be in "normal" condition to start up the Pitch TO.

- Begin automated start-up procedure.
- Begin the system purge procedure.
- Start the oxidizer burner. If burner will not start after 3 attempts, a re-purge of the oxidizer is necessary.
- Insure that oxidizer temperature is above 1350°F and fume differential pressure is at a minimum of 0.25" H_2O.
- The thermal oxidizer is now operational, and process emissions can be routed to the unit.

3.2.2 *Thermal Oxidizer Shutdown*

There are three main types of scheduled shutdowns for the Pitch TO: a normal shutdown, emergency automatic shutdown, and an emergency manual shutdown.

<u>Normal Shutdown</u>

- Prior to initiating the shut down, confirm Pitch TO is operational and ready to accept waste gas.
- Shut off the fume streams and stop any transfer to the blending tanks.
- Turn the burner off.

<u>Emergency Automated Shutdown</u>

When the process is shut down during an emergency automatic shutdown, the system automatically begins shutting down if any of the safety shutdown interlocks should trip. The Tar Distillation Operator must then:

- Stop any transfer to the blending tanks and reduce heat on these tanks until the Pitch TO is restarted and above the minimum operating temperature (1350° F).

<u>Emergency Manual Shutdown</u>

An emergency manual shutdown is started by the Tar Distillation Operator when required.

- Shut off the control power to all panel and field components.

- Stop any transfer to the blending tanks and reduce heat on these tanks until the Pitch TO is restarted and above the minimum operating temperature (1350° F).

3.2.3 *Malfunctions*

In the event of a malfunction that impacts the operation of the Type A Carbon Pitch Tanks, or results in emissions being discharged directly to the atmosphere, the operator must cease all material charging into the tanks. After this is achieved, the Supervisor will determine the cause of the malfunction and identify the necessary corrective actions. During a malfunction shutdown, the plant will minimize HAP emissions by one of the following methods:

- Ceasing blending operations;

- Vent emissions to the Pitch TO, provided this unit is operational; or

- If emissions are routed to the Pitch TO and the oxidizer is not operational, the #5 Fume Scrubber will provide some control, provided the scrubber is operational.

In the event of a malfunction that does not impact the operation of the tanks or does not result in emissions being discharged directly to the atmosphere, the operator can continue to blending materials in the tanks. The cause of the malfunction will be determined and the appropriate corrective action will be taken in order to restore the process to normal operating conditions. If the equipment cannot be restored in a timely manner, the process may be shut down to repair malfunctioning equipment.

3.2.4 *Monitoring Devices*

Type A Carbon Pitch MCPU is controlled by the Pitch TO. The oxidizer controls HAP emissions as necessary under the MON MACT. In order to demonstrate that the thermal oxidizer is operating correctly, the facility must continuously monitor the oxidizer combustion chamber temperature to ensure that a minimum temperature of 1350° F is achieved.

To reduce the risk of monitoring device malfunctions, Koppers will do the following:

- Calibrate the thermocouple on the routine schedule recommended by the instrument manufacturers.
- Perform the routine sensor maintenance specified by the manufacturer.

In the event that the monitoring device is observed to malfunction, the operator will cease blending operations and control emissions with the #5 Scrubber. Once the oxidizer is shutdown, troubleshoot the malfunction and repair/replace the device as necessary.

Malfunction	**Corrective Action**
General Malfunction	Determine cause of malfunction and take appropriate measures to restore malfunctioning equipment to normal operation, if possible.
Failed thermocouple	Cease blending in the affected Pitch Tanks. Control emissions with the #5 Scrubber. Determine the cause of malfunction and take appropriate measures to restore the monitor to normal operation.

3.3 *MAINTENANCE WASTEWATER*

This section describes the maintenance procedures for management of wastewaters generated from the emptying and purging of equipment in the process during temporary shutdowns for inspections, maintenance, and repair (i.e., a maintenance-turnaround) and during periods which are not shutdowns (i.e., routine maintenance).

Maintenance wastewater can be generated during cleaning operations in the Crude Tar Distillation Process, the Pavement Sealer Base process and the Type A Carbon Pitch Tanks. This generally consists of emptying process fluids from lines and equipment, wash-outs, and boil-outs.

The maintenance procedures for wastewater specify the:

- Types of process equipment or maintenance tasks that are anticipated to create wastewater during maintenance activities;
- Procedures that will be followed to properly manage the wastewater and control organic HAP emissions to the atmosphere; and
- Procedures to be followed when clearing materials from process equipment [§63.105].

Management Guidelines for Maintenance Wastewaters

Maintenance wastewaters can be generated from any piece of equipment throughout the MON MACT affected processes.

In addition to general maintenance provisions, the following procedural guidelines are intended to minimize HAP emissions to the atmosphere during clearing for maintenance activities that generate wastewater;

<u>Equipment, Vessel Piping Drains</u>

- Process fluids will be drained to the industrial sewer, if practicable.
- After initial draining of process fluids, equipment may be flushed with water and/or steamed to the industrial sewer.

- Accumulated condensate from steaming process vessels may be drained or flushed to the industrial sewer.

Heat Exchangers/Reboilers

- Process fluids will be transferred out of the exchanger to a storage tank, back to the process, or
- Volatile materials may be removed by steaming to the industrial sewer or flushing with clean water to the industrial sewer.

Pumps and Filter Housing Contents

- Pump contents may be purged back into the process, or drained to the industrial sewer via hard-pipe connection or hose to reclaim material to the extent practicable.
- If pump contents are drained to grade, they should be flushed with water to the industrial sewer.

Storage Tanks

- Tank contents will be transferred to another tank if practicable in order to maximize material recovery.
- Tanks may be drained to the industrial sewer via hard-pipe connection or hose.
- After initial draining of process fluids, vessels may be flushed with water to the industrial sewer, frac tank, or other container.
- Accumulated condensate from steaming process vessels may be stored in appropriate storage vessels.

Instrumentation/Control Valve Loop

- Instrumentation or control valve loops will be drained/purged into the process system, to the extent practicable, or collected in containers for returned to the industrial sewer as appropriate to minimize emissions.

4.0 RECORDKEEPING

4.1 GENERAL RECORDS

A copy of the current SSM Plan and any superseded versions will be maintained at the facility for a period of 5 years following each revision to the SSM Plan. The current version will be maintained at the site for at least 5 years after the life of the affected source or until the affected source is no longer subject to the MON MACT rule (40 CFR 63, Subpart FFFF). The Environmental Department will approve any revisions to the SSM Plan, or to procedures contained in it, before they are incorporated into a revision of the document.

For each startup, shutdown, or malfunction incident that results in excess emissions, information necessary to demonstrate compliance with the provisions presented in this SSM Plan will be documented. Figures 1, 2, 3 and 4 provide flow diagrams of the forms to complete and actions to take for SSM events. Documentation of the SSM events will take the form of a "checklists" that confirms conformance with the startup, shutdown, and malfunction plan and describes the actions taken for that event. Checklists are provided as part of this plan as Form #1 for the continuous temperature monitoring device for the thermal oxidizer and Form #2 for Crude Tar Distillation and the Type A Carbon Pitch Tanks.

The checklists, or their electronically-maintained equivalents, will serve as the records documenting the occurrence and duration of malfunctions of the flame monitoring system and each startup, shutdown, or malfunction of operation and each malfunction of air pollution control equipment. Files of these records will be kept readily available for inspection and review. Any SSM event shall be reported to the Environmental Department for subsequent review of the details to ensure that the SSM Plan was followed and any required reporting to the EPA is addressed.

Any actions taken during an SSM event that are consistent with this SSM Plan will be recorded in order to demonstrate that the procedures specified in this document were followed. This is fulfilled by using the SSM Checklist provided as Form #1 and Form #2. Repairs will be tracked using existing facility programs to document scheduled and actual repair dates and the status of specific repairs.

Any actions taken during an SSM event that potentially are not consistent with the procedures specified in this SSM Plan will be recorded using the Form #3. This form must be completed immediately following the event.

For each startup, shutdown, or malfunction, information necessary to demonstrate compliance with the provisions presented in this SSM Plan shall be documented [as specified at §63.998(c)(1)(ii)(D) through (G); 63.998(d)(3(ii) and 63.2520(e)(4)]. The required information includes:

- Occurrence and duration of each startup, shutdown, or malfunction of process operations or air pollution control equipment.
- Occurrence and duration of each malfunction of continuous monitoring systems.
- When excess emissions occur, were the procedures in the SSM Plan followed and, if not, then what actions were taken to respond to SSM event.

Information related to the startup, shutdown or malfunction of the MON MACT affected units will be recorded on Form #1 and #2. If the actions taken are not consistent with the SSM Plan or the event is not identified in the SSM Plan, so note when completing Form #3.

4.2 *RECORDKEEPING FOR MALFUNCTIONS OF THE CONTINUOUS MONITORING SYSTEM (CMS)*

Malfunctions of the continuous monitoring system that records the thermal oxidizer temperature are covered on Form #3. The required information includes:

- The date and time identifying each period that the CMS was inoperative;
- The nature and cause of any malfunction (if known);
- The corrective action taken or preventive measures adopted;
- The nature of repairs or adjustments to the CMS that was ; and
- Indication if the SSM Plan was followed when dealing with the malfunctioning CMS.

5.0 *REPORTING*

5.1 *COMPLIANCE REPORTS*

The MON MACT require that SSM reports be provided as part of the compliance report specified at 63.2520(e). If an SSM event occurs during this reporting period that results in excess emissions, an SSM report will be submitted as part of the compliance report to the appropriate regulatory agency for that reporting period. The report will contain information describing how the actions taken during the SSM event were consistent with the SSM Plan, or documentation of actions taken that are not consistent with the SSM Plan and include a brief description of each malfunction.

5.2 *STATE REPORTING*

In addition to the federal SSM reporting requirements of the MON MACT, Illinois EPA has reporting requirements for equipment malfunctions with which the facility must comply. The reader is referred to the appropriate construction permit and operating permit for reporting requirements.

6.0 RESPONSIBILITIES

The Environmental Manager will be responsible for reviewing the SSM events and notifying the appropriate authorities, if necessary.

7.0 REVISIONS TO THE PLAN AND RECORDS RETENTION REQUIREMENTS

The Environmental Manager will, for each SSM event, review the actions taken in response to the event and the details provided in the forms to determine whether the procedures identified in the SSM Plan were followed. The Environmental Manager will also determine if the SSM Plan was adequate for the event. If the SSM Plan was not adequate to cover the event, the Plan shall be revised. When evaluating the SSM Plan, the following criteria shall be considered:

- addresses how excess emissions are to be managed for typical startup, shutdown, or malfunction events;
- provides for the operation of equipment during SSM events in a manner consistent with good engineering and air pollution control practices for minimizing emissions;
- provides adequate steps for correcting malfunctioning air pollution control equipment as quickly as practical.

If the SSM Plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction, the plan shall be revised within 45 days of the event to include procedures for similar malfunction events (40 CFR §63.6(e)(3)(viii)). Form #4 is provided in this plan to track revisions to the plan.

The current and any superseded SSM Plans shall be maintained on-site as specified in §63.6(e)(3)(v). §63.6(e)(3)(v) requires that superseded plans remain at the facility for a period of 5 years following their revision.

8.0 ATTACHMENTS

FIGURE 1 - SSM EVENT DOCUMENTATION FLOW DIAGRAM
FIGURE 2 - SSM EVENT WITH OXIDIZER TEMPERATURE MONITORING SYSTEM
FIGURE 3 - SSM EVENT FOR CRUDE TAR DISTILLATION, THERMAL OXIDIZER, OR TYPE A CARBON PITCH TANKS
FORM 1 - OXIDIZER TEMPERATURE CONTINUOUS MONITORING SYSTEM (CMS) - MALFUNCTION CHECKLIST & LOG
FORM 2 - STARTUP, SHUTDOWN AND MALFUNCTION CHECKLIST & LOG FOR CRUDE TAR DISTILLATION, THERMAL OXIDIZER, OR TYPE A CARBON PITCH TANKS
FORM 3 - SSM EVENT REPORT
FORM 4 - MACT SSM PLAN REVIEW AND REVISION LOG

Figure 1 - SSM Event Documentation Flow Charts

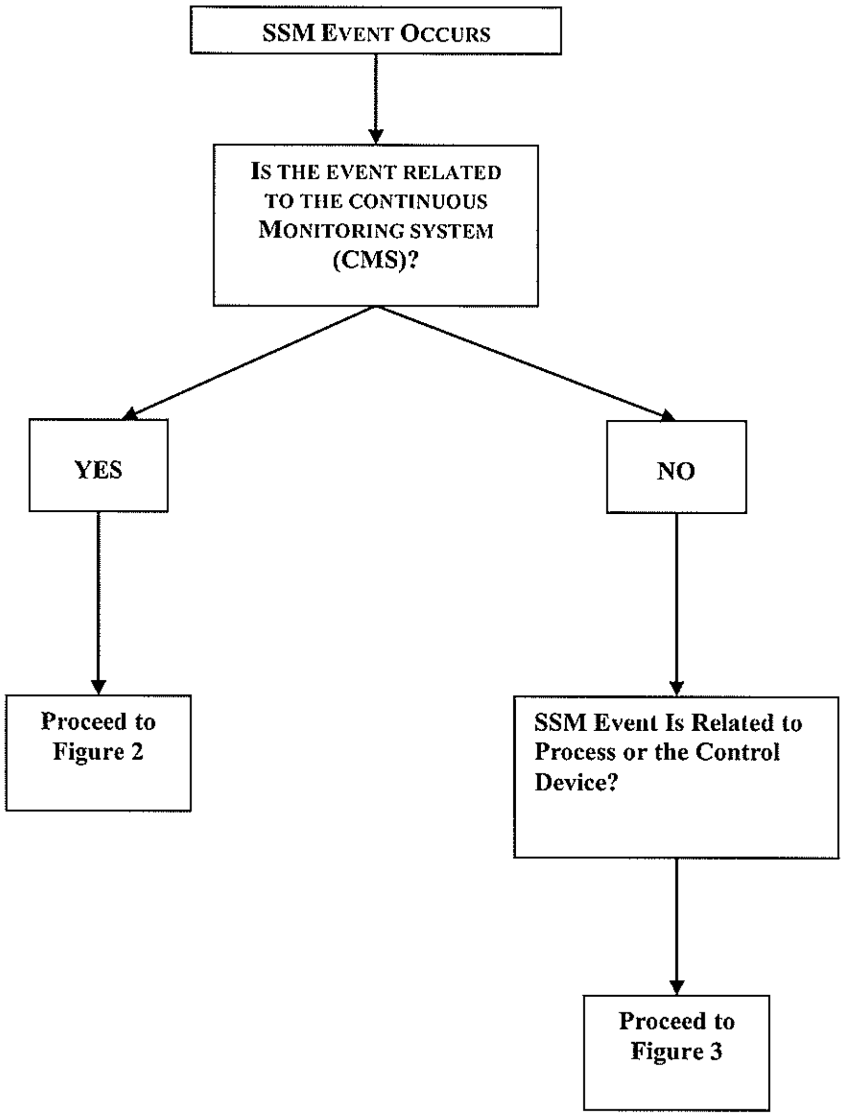


Figure 2 – SSM Event with Monitoring System

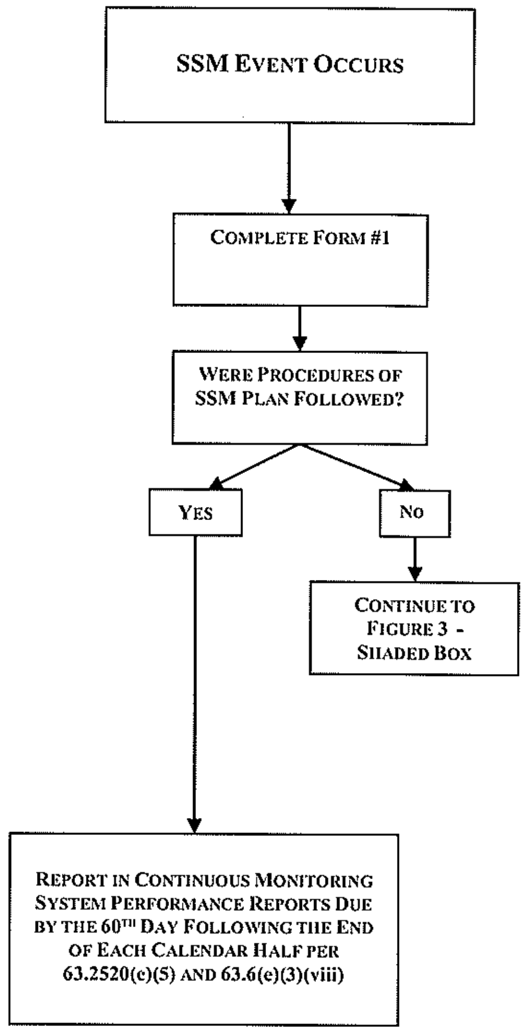
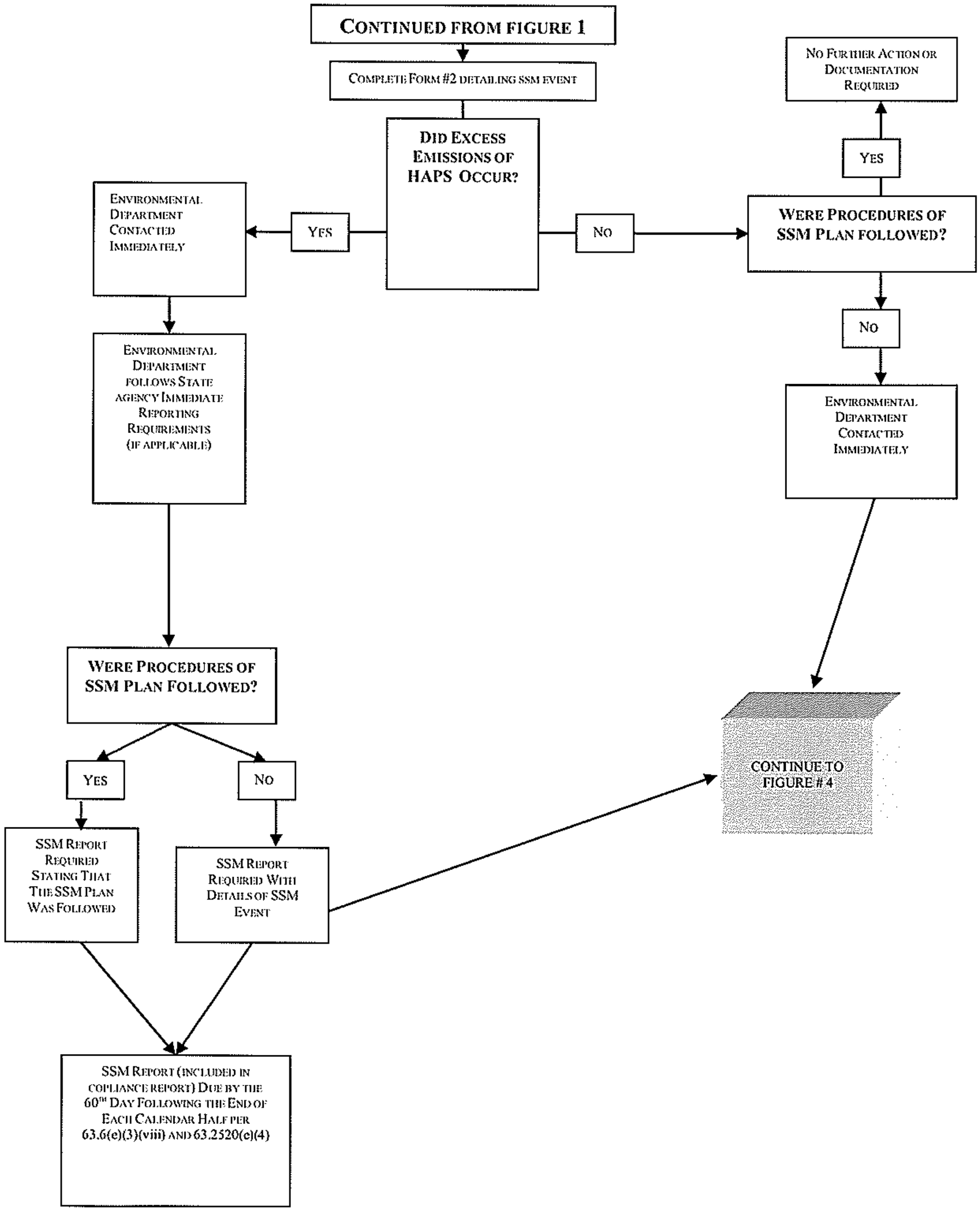


Figure 3
SSM Event for Chemical Processes and Air Pollution Control Devices



FORM # 1 - MONITORING SYSTEM (CMS) –MALFUNCTION CHECKLIST & LOG

Page ___ of ___

Activity (circle one)	**Date/Time Activity Starts**	**Date/Time Activity Ends**	**Nature and Cause of Malfunction**	**Describe Corrective actions taken, including repairs or adjustments to monitoring system**	**SSM Plan Followed?**
Inoperative QA/QC Calibration Other Cause					Yes / No
	Env. Dpt. Only Duration (Hours/Minutes)				
Inoperative QA/QC Calibration Other Cause					Yes / No
	Env. Dpt. Only Duration (Hours/Minutes)				
Inoperative QA/QC Calibration Other Cause					Yes / No
	Env. Dpt. Only Duration (Hours/Minutes)				

FORM # 2 - STARTUP, SHUTDOWN AND MALFUNCTION CHECKLIST & LOG

Page ____ of ____

Activity (circle one)	Date/Time Activity Starts	Date/Time Activity Ends	If Malfunction, What Was Cause and Corrective Action?	SSM Plan Followed?	Form 3 Required? (Note 1)	For Env. Dept. Use Only Duration Hours/Minutes
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	
Start-up Shut Down Malfunction				Yes / No	Yes / No	

Notes:

1. Form 3 required if the following occurred: Startup, Shutdown or Malfunction occurred and SSM Plan was not followed.

Form #3 - SSM Event Report

Identify the Area of the Event : **Process__________ Control Device_______________**

Date: ____________ Shift: ____________ Name: __________________________

Event being reported:

Start Up ____________ Shutdown ____________________Malfunction__________________

Please give a brief description of the event and corrective actions taken:

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Time Event started: ____________ (Date, Hour, Minute)_ Time Event ended:_______________ (Date, Hour, Minute)

Please describe in detail why the plan was not followed:

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THESE FORMS MUST BE FORWARDED TO THE ENVIRONMENTAL MANAGER AFTER EACH OCCURRENCE

FORM 4 - SSM Plan Review & Revision Log

Date	Revision #	Action Taken	Initials
05/10/08	00	Original document	
	01		
10/18/19	02	Update procedures to reflect that Tar TO (TO1-4) is not used as a back up to the Tube Heaters 1 & 2, Remove PAI content since SSM no longer applies.	HM
11/06/2020	03	Update recordkeeping to include use of the electronic SSM system.	CP