Indiana Harbor Coke Company, L.P.

PREVENTIVE MAINTENANCE

AND OPERATION PLAN

(PMO Plan)

January 2019

List of Acronyms

CAP	Compliance Assurance Plan
CCR	Central Control Room
C/S	Coke Side
CUI	Corrosion Under Insulation
DCS	Distributed Control System
dP	Differential Pressure
EAM	Enterprise Asset Management
ETS	Emission Tracking Software
H_2O	Water
HRSG	Heat Recovery Steam Generator
IDEM	Indiana Department of Environmental Management
IHCC	Indiana Harbor Coke Company, L.P.
IHCC Air Permit	Title V Permit 089-36826-00382 and its subsequent revisions, renewals, and any modifications
IR	Infrared Thermography
MOC	Management of Change
MWP	Maintenance Work Process
NESHAP	National Emission Standards for Hazardous Air Pollutants
O_2	Oxygen
PCM	Pushing/Charging Machine
PM	Preventive Maintenance
PM Emissions	Particulate Matter emissions
P/S	Push Side
PMO Plan	Preventive Maintenance and Operation Plan
RCFA	Root Cause Failure Analysis
SO_2	Sulfur Dioxide
USEPA	United States Environmental Protection Agency
40 CFR	Title 40 of the Code of Federal Regulations
VM	Volatile Matter

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I. INTRODUCTION

This document serves as the Preventive Maintenance and Operation Plan (PMO Plan) for Indiana Harbor Coke Company, L.P. (IHCC), which has been prepared to ensure compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP) and with Title V Operating Permit No. 089-36826-00382 and its subsequent revisions, renewals, and any modifications (IHCC Air Permit).

The PMO Plan has been developed pursuant to a Consent Decree with the United States and the State of Indiana, which was entered in the United States District Court for the Northern District of Indiana with an Effective Date of 10/25/2018 (Consent Decree).

All employees of IHCC, as well as contractors and subcontractors, shall follow the guidelines detailed in this plan.

II. PURPOSE OF THE PMO PLAN

IHCC's PMO Plan shall have the goal of minimizing Coke Oven Leaks through the proper operation and integrity of the facility's oven maintenance program as well as compliance with limits and requirements established in the Consent Decree. The purposes of the PMO plan are to:

1. Set forth a plan to implement enhanced maintenance and operation of IHCC's Rebuilt Ovens.
2. Provide that IHCC operates and maintains its control systems, affected sources, and monitoring equipment in a manner consistent with safety and with good air pollution control practices and minimization of emissions as required by the Consent Decree and the IHCC Air Permit, and regulations promulgated under the CAA.
3. Provide procedures for maintenance and operation in order to minimize emissions at the facility from Coke Oven Leaks.

IHCC shall comply with the PMO Plan at all times.

III. DEFINITIONS

a) Definitions used in this PMO Plan that are specific to individual steps of coke production:

1. Battery: IHCC has four batteries denoted A, B, C, and D; Each Battery includes multiple banks of 16 or 17 Ovens.

2. Bypass Vent Stack: each vent stack located between the Coke Oven battery common tunnel and each Heat Recovery Steam Generator (HRSG).

3. Bypass Venting: the redirection of a flue gas stream through the Bypass Vent Stacks directly to the atmosphere for any reason. Bypass Venting through a Bypass Vent Stack commences when a Bypass Vent Stack lid opens and continues until the Bypass Vent Stack lid closes.

4. Bypass Venting Incident: all Bypass Venting that results in an exceedance of the Consent Decree's or the IHCC Air Permit's 19% daily bypass venting limit.

5. Bypass Venting Percentage: the venting as tracked through the Emissions Tracking System (ETS), which tracks the percentage of Bypass Venting in daily and 3-hour block averages.

6. Coal Sulfur Content or Sulfur Content: the elemental composition of sulfur in coal by weight as determined by methods approved in the IHCC Air Permit.

7. Coke Oven or Oven: any heat recovery oven at Batteries A, B, C, or D.

8. Coke Oven Door Leak: emissions during a Coking Cycle from a Coke Oven door that do not comply with Title 40 of the Code of Federal Regulations (40 CFR) §63.303(b)(1) or (c)(2).

9. Coke Oven Leak or Leak: any Coke Oven Door Leak or Crown Opacity. Visible emissions that occur during a Lightning Stand-Down shall not be considered a Coke Oven Leak for purposes of the PMO Plan provided the visible emissions do not continue for longer than 15, 30, or 45 minutes, as applicable, after the Lightning Stand-Down is over. The actions required in response to a Coke Oven Leak, per the Consent Decree, begin January 1, 2019 and continue until the Consent Decree is terminated.

10. Coke Oven Leak Root Cause Failure Analysis (RCFA) Trigger Level or RCFA Trigger Level: is either (a) when an oven experiences Coke Oven Leaks in two consecutive Coking Cycles, or (b) when an oven experiences Coke Oven Leaks in four or more Coking Cycles in a calendar month. Leaks that result from operator error (e.g., failure to open dampers, close sole flues when a leak is detected, etc.) shall not count in determining whether the Root Cause Failure Analysis (RCFA) Trigger Level has been reached.

11. Coke Oven Root Cause Failure Analysis or Coke Oven RCFA: an assessment conducted to determine the primary cause and any contributing cause of triggering a Coke Oven Leak RCFA Trigger Level.

12. Coking: the process where coal that has been placed in a Coke Oven undergoes destructive distillation to produce coke.

13. Coking Cycle: the time that begins after the Oven has been charged with coal and both doors have been placed on the Oven and ends when a door is removed.

14. Coking Operations: IHCC's operation of Coke Ovens and other coking equipment.

15. Crown Opacity: emissions during a Coking Cycle from a Coke Oven crown that causes at least 20% opacity for three (3) minutes using USEPA Method 9. IHCC has the option to use USEPA Alternative Method 082 in lieu of USEPA Method 9.

16. Distributed Control System (DCS): a computerized system that provides visibility and control to various measurements and aspects of the IHCC facility.

17. Lightning Stand-Down: when lightning is within a ten (10) mile radius of the Facility as determined by a third-party weather tracking service, and exposed outdoor work must be stopped in accordance with IHCC's severe weather safety policy. A Lightning Stand-Down is over when an "all-clear" announcement is made after a thirty (30) minute period of no strikes within the ten (10) mile clearance radius in accordance with IHCC's severe weather safety policy.

18. Oven Rebuilds: repairing Ovens by removal and replacement of the Oven floor and sole flues and repair of Oven wall cracks.

19. Heat Recovery Steam Generator (HRSG): an energy recovery heat exchanger that recovers heat from a hot gas stream for the purpose of steam generation.

20. Rebuilt Ovens: Ovens that have undergone Oven Rebuilds.

21. Structural Issues: issues involving the Oven structure (cracks or other damage to walls, floors, or flues; problems with Oven sealing; and/or other problems associated with the Oven structure) that cause Coke Oven Leaks.

b) Definitions used in this PMO Plan to describe IHCC's systems and processes:

1. Emission Tracking Software (ETS): the emissions tracking software that is used to track bypass venting (i.e., record the percentage of bypass venting in daily and 3-hour block averages) and main stack emissions and bypass vent stack emissions (SO_2, PM, and lead).

2. Enterprise Asset Management System (EAM): a computerized asset maintenance system that provides asset management, work management, materials management, and purchasing capabilities to help IHCC maximize productivity and extend the life of its assets. IHCC currently uses IBM MAXIMO ("MAXIMO") as the EAM.

3. Maintenance Work Process (MWP): the process used at IHCC to efficiently execute maintenance activities on process equipment and facilities.

IV. PREVENTIVE MAINTENANCE

Preventive Maintenance (PM) is the performance of maintenance tasks that either 1) repair or service emission units in accordance with good engineering and air pollution control practices, 2) extend the life of an asset, or 3) detect a potential for unplanned failure. PM is managed within the Enterprise Asset Management (EAM) system. A PM record is a plan to perform periodic work on an asset or group of assets. The EAM system automatically generates certain PM Work Orders at a predetermined time interval to provide a method in which to execute the work in the field. PM tasks can be categorized as safety or environmental critical, which carry a higher scheduling priority than other PMs within the Maintenance Work Process (MWP).

All PMs are housed in the EAM system as described here. PM records contain the relevant information for conducting the PM and ensuring that the objectives described above are met. This may include, but is not limited to, the following: a job plan, the craft of group assigned to execute the task, the frequency for conducting the PM, a list of specific tasks that should be performed, a list of specific parameters that should be met, a list of equipment or tools necessary to conduct the PM, requirements for data collection or observations, and/or the location of the equipment to be serviced. PMs are updated as equipment or needs change or additional PMs are identified. Since the most current and up to date list of all PMs resides in the EAM system, a list is not included in this PMO Plan. An example list of environmental critical PMs is included as Attachment A – Example List of Environmental Critical PM. The current and up-to-date list of PMs is maintained in the EAM system; this PMO Plan will not be updated to reflect changes to the Environmental Critical PM list.

A completed PM record contains the statement of work (job plan), the name of the person or group who executed the PM task, and the date the PM was performed. Results of PM inspections may be reviewed for technical content and potential follow up actions by the Maintenance Planner. Paper copies of completed environmental critical PM work orders may be routed to the plant Environmental Manager or Environmental Representative for review. The work order closure process flow is included as Attachment B – PM Workflow Process.

V. QUARTERLY INTERNAL AND EXTERNAL OVEN HEALTH INSPECTIONS (CONSENT DECREE IV.D.23.a.i.)

Quarterly internal and external oven health inspections will be conducted by trained inspectors to assess the current state of each oven, following documented oven inspection procedures and recommended repairs. Employee training for the quarterly inspections is described in Section X.

The oven sole flue, oven mechanical, oven chamber, and oven refractory exterior, or crown area, inspections will be conducted, internally, on a quarterly basis following documented procedures, as described in Section V of this Plan and in accordance with checklists included as Attachments C, D, and E. Summary forms are maintained that documents any findings, which also include findings from additional inspections including the Infrared Thermography (IR) Scan, Oven Door Inspections, Damper Block Inspections, and Declinker Inspections. These findings will be reviewed by SunCoke personnel to determine whether action is required for each particular finding or whether a finding will simply continue to be monitored. Personnel designated to monitor and assess oven health will hold regular meetings to discuss changes to oven inspection procedures and scheduling. Any future revisions to the following summarized inspection procedures are documented within their respective revision logs.

General size definitions for various oven conditions identified in oven health inspections are summarized in Table 1. Repairs are also dependent on the location of the erosion and cracks within the coke oven. This table is for example purposes only.

Table 1. Summary of General Oven Condition Erosion/Crack/Blockage Size Definitions

Oven Condition Description	Size Definition	Repairs
· Minimum or Small Erosion/Cracks	· ¼" – ½" wide; no gas flow leaking through crack	· Silica weld the crack
· Moderate Erosion/Cracks	· ½" – 1" wide; small gas flow leaking through crack	· Silica weld the crack
· Severe Erosion/Cracks	· Large enough for material (coal/coke) to pass through crack	· Silica weld the crack to allow for planning of rebricking of wall, then rebrick cracked area.
· Debris in Sole Flue	· Range from 0%, 25%, 75%, and 100% blockage	· Cleanout blockage >50%, weather permitting

A. Sole Flue Inspection

The sole flue inspection program is designed to evaluate the condition of the sole flue chambers at IHCC. The sole flue chambers are responsible for containing and promoting the combustion process as the volatile matter (VM) begins to burn off in the oven during the coking process. These chambers are comprised of a series of expansion joints and various silica brick shapes that come together to form four (4) gas passageways. These gas passageways carry the flue gas to the uptake portions of the oven and promote floor heating to assist in the coking process.

The sole flue inspection is completed on both the push and coke sides of the ovens where either a damper or an inspection brick is present. The inspection brick of the desired oven is removed to begin the inspection. The conditions observed during the inspection are recorded for further analysis to

determine whether any repairs may be necessary or whether there are items that require continued monitoring. Findings are summarized in a form, as Attachment C – Oven Health Inspection Summary Form – Sole Flue. The following is an example list of conditions that are checked during the inspection:

- Pinched/Slipped/Flattened Rings or Arches
- Drops or Debris in Sole Flue (i.e. Fallen Brick)
- Sole Flue Wall Damage (i.e. Cracks)
- Sole Flue Melt/Overheating
- Cracks and Signs of Air Leakage on the Sole Flue Floor (i.e. Black Lines)
- Previous Silica Weld Repair Condition
- Broken Sole Flue Damper Support and/or Damage

Repair designations and suggestions for repair timing for identified sole flue damage resulting from this inspection are summarized below. All sole flue repairs shall be completed as soon as practicable. If any sole flue repair is not completed within 120 days, then IHCC shall document the reasons for the delay.

- Minimum – a small crack, nearly superficial and will be monitored for future expansion. Little to no debris in sole flue.
- Moderate – the crack has observed gas passing through the crack and now requires action. Welding is recommended. Debris blocks sole flue approximately 50%, clean out should be reviewed.
- Severe – The crack is allowing material to pass through and repairs are needed as soon as practical. Debris in sole flue requires clean out.

B. Mechanical Inspection

The mechanical inspection program is a system designed to capture damage to key mechanical components of IHCC's coke ovens, summarized below. These components help maintain the refractory integrity of the oven during thermal cycling and ensure that proper tension and sealing is maintained for optimal oven performance.

I. Visible Components

The mechanical inspection is completed on both the push and coke sides of the ovens, as well as top and bottoms of the ovens. The entire coke oven, including but not limited to the following equipment, will be checked during the inspection:

- Buckstays
- Tie Rods (Both Top and Bottom) - spring assemblies
- Sill Beams
- Lintels

- Doors
- Jamb Plates
- Battery Benches
- Oven Door
- Sole Flue End Wall Beam
- Sole Flue Damper Pipe

Conditions observed during the inspection, summarized in Table 2 below, are recorded for further analysis to determine whether any repairs may be necessary or whether there are items that require continued monitoring. This table is for example purposes only. Findings, such as Minimum, Moderate, and Severe repair requirements, are summarized in a form, as Attachment D – Oven Health Inspection Summary Form – Mechanical.

II. Non-visible components

- Downcomers and upcomers
- Underneath walls

Non-visible portions of the oven, which include downcomers, upcomers, and underneath the walls, cannot be inspected directly. However, issues related to these areas may be inferred based on damage in visible areas of the oven, such as damage to adjacent airspace beams next to the wall or cracks in the wall of the oven. Conditions observed during the monitoring of visible components will be recorded and analyzed to determine whether maintenance or repairs on non-visible components will be necessary following inspection or at a later date.

Table 2. Summary of Conditions in Mechanical Oven Health Inspection

Component List	What to Check	Condition(s)
(Items and equipment to be checked under each task)	(Detailed list of what must be completed under each task)	(List of conditional states of deterioration)
· Buckstay	· Top	· Twisted, bowed, plumb, machinery contact
	· Middle	· Gaps between refractory wall and buckstay
	· Bottom	· Attached to foundation, corrosion
· Tie Rod Assembly (top and bottom) (left and right)	· Spring	· Compressed/relaxed spring, missing spring
	· Nut/bridle	· Broken spring/tie rod, 2010 design or original
		· Bent or twisted spring assembly
	· Clean for proper air flow	· Air space open

· 8" or 12" support beam (between slab and pad)	· Original position or spacing	· Structural integrity and corrosion
	· Deteriorated/structural integrity	· Warped, thinned, elastic collapse
· Lintel	· Signs of overheating – discoloration, flame during charge	· Verify brackets are installed to secure lintel
	· Deterioration/gaps in refractory	· Burnt, leaking – air infiltration
	· Correct position	· Lintel dropped or uneven
· Jambs	· Check for separation between refractory and jamb plate	· Deterioration, spalling
	· Separation between jamb and buckstay	· Sill plate out of position
	· Check for overheating	· Material is warped
	· Bottom sill plate	· Sill plate out of position
	· Broken/cracked jamb	· Deterioration
· End wall	· Check structural for alignment	· Broken, cracked refractory
	· Check for brick displacement or deformity	· Bulging sections of brick

C. Oven Chamber Inspection

The oven chamber inspection program is designed to evaluate the condition of the coking chamber at IHCC. The coking chamber is responsible for holding the coal charge, sustaining and containing the phase change, and releasing H_2O and VM from the coal bed. The inspection process is based on the use of photography and the comparison of photos between inspections. The oven chamber inspection is completed by taking photographs of the oven, after it has been pushed out, from the pusher side.

The following lists conditions that will be checked for during the inspection, reviewed in the photographs, and are triggers for repairs:

- Wall Cracks at Uptakes and Down Comers
- Failed Down Comer Arches
- Damaged Crown Arches
- Wall Holes/Erosion
- Damaged Refractory on Lintels/Side Jambs
- Loose or Fallen Crown Brick
- Cracks in Oven Walls (where flame is passing through cracks in oven walls)
- Floor Holes
- Carbon Thickness
- Pusher Side Sill

Repair designations and suggestions for repair timing for identified damage resulting from this inspection are summarized below:

- Minimum – a small crack, nearly superficial and shall be monitored for future expansion.
- Moderate – the crack has observed gas passing through the crack and now requires action. Welding is recommended.
- Severe – The crack is allowing material to pass through and repairs are needed as soon as practical.

Findings are summarized in a form, included as Attachment E – Oven Health Inspection Summary Form – Oven Chamber. All photos are maintained electronically for future comparison and in accordance with recordkeeping requirements.

D. Oven Refractory Exterior Inspection

The oven refractory exterior inspection, which includes the oven crown area inspection, is completed on top of the ovens on both the push and coke sides of the ovens. Findings are summarized in a form, included as Attachment E – Oven Health Inspection Summary Form – Oven Chamber.

Repair designations and suggestions for repair timing for identified exterior refractory repair resulting from this inspection are summarized below:

- Minimum – a small crack, nearly superficial and will be monitored for future expansion.
- Moderate – the crack has observed gas passing through the crack and now require action. Patching is recommended.
- Severe – The crack is allowing gaseous material to pass through and may cause bricks to fall out; repairs are needed as soon as practical.

1. Oven Crown

The oven crown is a combination of ceramic wool, and gunnite. Multiple layers are utilized to better insulate the oven silica brick and help maintain a steadier change in thermal cycling as the refractory proceeds through the coking process. During the inspection, the following is examined:

- Cracking and/or Hooved-Up Gunnite (with a focus at inspecting the lintel plate area of both the coke side (C/S) and push side (P/S))
- Evidence of Flames
- Smoke or Escaped Emissions
- Interface at the Lintel and Crown Brick

2. End Walls and Buttress Walls

The oven end walls contain the sole flue dampers and inspection bricks. The following are examined during the inspection:

- Spalling of Face Brick
- Erosion
- Glowing Cracks within Brick Mortar
- Damaged or Missing Face Brick
- Leakage Behind Sill Beam and Sole Flue Area

3. Center Jambs

Jambs provide sealing along the sides of the door and translate pressure from the buckstay to the silica brick oven walls. Any discoloration and signs of smoke in the areas of the center jambs are noted.

E. Infrared Thermography (IR) Scan

Infrared thermography (IR) is the condition-monitoring tool utilized to trend external metal temperatures of refractory lined equipment using an IR camera. IR can be used to identify areas where the refractory lining is exhibiting signs of deterioration. All data obtained during the examination will be evaluated to determine if repairs are necessary, and if not, based on their relevancy, be put on a monitoring schedule.

The IR inspection applies to refractory lined equipment at IHCC summarized below:

- Common Tunnels
- Vent Stacks
- Crossover Ducts

Upon completion of the IR inspection and data evaluation, areas showing indications of refractory deterioration, as indicated by “hot spots” that show higher temperature readings during the IR scan, shall be prioritized for repairs or subsequent inspections based on the observed temperature of the “hot spots.”

F. Oven Door Inspections

Oven doors provide an access portal to the coking oven chamber. Its primary focus is to retain heat through a refractory insulating castable attached shape and latch securely to the oven buckstay. The door is constructed to provide a good sealing area between the lintel plate, jamb plate, and door sealing edge. The doors, lintels, and jambs are key components to maintain heat, reduce air infiltration, and allow access to the coke chamber for pushing and charging.

External door inspections will be conducted at least quarterly. The oven door inspections provide the necessary information for repair prioritization and work order scheduling.

When viewing the doors, personnel will look for holes, overheating, latches and their positions, sill beam position, damper functionality and integrity, and warping/bowing. In addition, personnel will note if gas lances are installed, if there are missing latches, and if the ceramic wool is missing or intact.

Findings are summarized in a form, included as Attachment D – Oven Health Inspection Summary Form – Mechanical.

G. Damper Block Inspections

Damper Block Inspections will be utilized to evaluate and understand the condition of the damper blocks. The uptake dampers are comprised of lightweight materials that are vacuum bonded to the desired shape or are pre-cast refractory shapes. These dampers are actuated using an air cylinder and controlled via computer system. The Damper Block Inspections determine whether any repairs are needed to the uptake areas, as identified by a stuck damper block or a broken damper block that negatively impacts uptake functionality. Areas inspected include the presence and integrity of the damper block currently installed as well as the functionality of their respective air cylinder.

Damper Block inspections are conducted at least quarterly with results of the inspection documented within the work order, for review, following the PM workflow process.

H. Declinker Inspections

Declinker Inspections are utilized to evaluate the level of built-up carbon material called “clinker” on the floors of Coke Ovens. This inspection determines whether a coke oven needs to undergo a declinker process and can include a measurement for the amount of carbon “clinker” present in the coke oven. Findings are summarized in a form, included as Attachment E – Oven Health Inspection Summary Form – Oven Chamber.

Declinker Inspections are conducted at least annually.

VI. PROCEDURES FOR REPAIRS RESULTING FROM COKE OVEN HEALTH INSPECTIONS

Depending on the results of the inspections previously summarized, various parts of the coke ovens may require routine maintenance and repairs. Any issues discovered during the inspection will be documented in their respective summary forms, following the PM Workflow Process, and are included as Attachment C – Oven Health Inspection Summary Form – Sole Flues. Table 3 provides an example summary of typical recommended coke oven repairs from oven health inspections. This table is for example purposes only; this PMO Plan will not be updated to reflect changes to this table.

Table 3. Summary of Typical Oven Adjustments and Repairs

Title	Trigger for Repair	Recommended Repairs
Ceramic Wool Repair	Poor/Missing Ceramic Wool	Repair/Replace Ceramic Wool
Limit Switches Reset	Limit Switches Not Accurate	Reset Limits
Insufficient Common Tunnel Pressure	Common Tunnel Pressure Causing Low Draft	Raise Draft
Blocks Stuck-Build-up in Tracks	Blocks Stuck-Build-up in Tracks	Clean Tracks
Lintel Repair	Bad Lintel	Patch and Schedule Repair
Cam Bolts Replacement	Missing Cam Bolts	Replace Cam Bolts
Door/Refractory	Bad Door/Missing	Replace Door
Blocks Replacement	Broken Blocks	Replace Blocks
Restore Power to Unit	No Power to Unit	Restore Power
Changing Damper Block	Cracking, Missing, or Drifting from Set Positions	Repair/Replace Damper Block
Hot Patch Door	Hot Spots	Patch the refractory
Insulating the Crown	Damaged Crown Arches, Loose or Fallen Crown Brick	Replace the Ceramic Wool and/or Brick
Declinkering Ovens	Carbon Build-Up	With the Oven Empty, Use the Pusher Ram, According to Procedures, and Scrape Away Built Up Clinker
Ceramic Welding Repair	Cracked Refractory Brick	Fill Cracks/Holes via Ceramic Welding

The list of recommended repairs is updated and revised based on operating experience with the most up-to-date version is maintained physically and/or electronically on IHCC's servers, as required. The current list of recommended repairs is available for inspection on-site upon request. Additional detail for more common coke oven repairs are summarized in the following subsections:

1. Repair Procedure for Changing a Coke Oven Uptake Damper Block

This repair procedure summarizes an example method for removal and replacement of the uptake damper block, performed after identifying necessary repairs from an inspection. The repair procedures for the uptake damper blocks on the P/S and the C/S of the oven are identical. If an oven has multiple damper blocks stacked, the bottom top is removed first, followed by the middle and bottom blocks. Otherwise, the single damper block is removed and replaced as a single piece. Removal is done using a block ladder, a device that the block can roll along saving the workers from the strain of the full weight

of the block. If all of the blocks need to be removed, it is recommended to inspect and clean the transition slide while access is readily available. The new uptake damper blocks are replaced into the slide using the block ladder and inspected by raising and lowering the slide to ensure the uptake functions properly.

2. Repair Procedure for the Hot Patch of a Coke Oven Door

This repair procedure summarizes an example method for hot patching a door, the purpose of which is to quickly and efficiently repair the coke oven door refractory. With the door rack on the loader bucket, the respective access procedures for the P/S and C/S are followed, as applicable. With the top latches slid in and the cams removed, the damaged door is removed and a new door is installed. For the P/S only, the oven belt must be running. The damaged door requiring a hot patch is then removed from the door rack and laid down with the material side up. Forms are placed on the areas that require patching. After the area is patched, the area is then covered with ceramic wool. After drying, the door is then set back in the rack or reinstalled onto the coke oven. Other methods may be used for hot patching a coke oven door, as appropriate, such as having coke oven doors repaired by a third party.

3. Repair Procedure for Insulating the Coke Oven Crown

This repair procedure summarizes an example method for insulating the crown on both the C/S and P/S of the coke oven, the purpose of which is to prevent or reduce air leakage at the oven crown area, ultimately minimizing Coke Oven Leaks. When an area is identified for repair, sealant is injected for repair or the existing insulation is removed and replaced with new insulation to reseal the area.

4. Repair Procedure for Declinkering Coke Ovens

This repair procedure summarizes an example method for declinkering ovens or carbon removal. Clinker is the eventual carbon buildup on the floors of coke ovens. An average coke oven should be declinkered approximately every 3-4 years. However, depending on the average charge weights and operating temperatures, the process may need to be completed earlier in the 2-3 year range.

An oven selected for declinkering is pre-inspected for possible wall welding requirements and sole flue arch conditions, and is then pushed empty. Oven temperature is closely monitored by the Product Technicians/Burners during this time. When the oven is ready for declinkering, the PCM pushing ram is eased into the oven for declinkering so that the ram head catches the buildup on the bottom of the floor. The process may be repeated several times as needed. Other methods may be used, as appropriate, in the process of declinkering.

Upon successful declinkering, the oven is then returned to production by “stepping” up the charge weights to minimize charges sticking to the floor of the oven.

5. Repair Procedure for Ceramic (Silica) Welding for Coke Ovens

This repair procedure summarizes an example method for performing ceramic (silica) welding for refractory cracks identified in a routine oven chamber inspection. Through normal use, a coke oven will develop cracks as the refractory ages.

Refractory cracks are referred to as:

- Minimum – a small crack, nearly superficial and will be monitored for future expansion.
- Moderate – the crack has observed gas passing through the crack and now required action. Welding is recommended.
- Severe – The crack is allowing material to pass through.

The refractory is first prepared for welding by cleaning the refractory of loose rubble and carbon build-up. The ceramic welding is performed following the recommended welding practices, such as filling holes in a progressive and circular motion. Once welding has been completed, the welding area is visually inspected.

VII. QUARTERLY VISUAL INSPECTIONS OF COMMON TUNNEL (CONSENT DECREE IV.D.23.a.ii.)

The common tunnel is a cylindrical pipe, approximately six (6) feet in diameter, which joins oven uptakes on a battery. During the coking process in each oven, flue gas is drawn through the common tunnel using negative pressure generated by Cokenergy or the Bypass Vent Stacks.

An internal inspection of the common tunnel is used to determine if there are any potential blockages. This is done by visually inspecting the common tunnel from each end. In addition to an internal inspection, an external inspection of the common tunnel will be conducted quarterly to determine if there are any holes, or potential holes, and will be scheduled as a PM work order within the EAM system. During the external inspection, the top half of the common tunnel and stacks are scanned with an infrared tool and/or visual inspection.

Additionally, IHCC personnel will review pressure readings reported by the differential pressure (dP) cells in the common tunnel to determine whether any loss of negative pressure could be attributable to potential blockage. The common tunnel dP cell locations are summarized in Section IX of this PMO Plan.

After the inspections, the Oven Repair Supervisor, or equivalent, will make any necessary recommendations for common tunnel cleaning, repair, and/or replacement that affects negative pressure. Common tunnel cleaning, repair, and/or replacement is commenced as soon as practical and documented with generated work orders within the EAM system. Repair procedures for the common tunnel are found in Section VIII of this PMO Plan. An example copy of the common tunnel inspection is included as Attachment F – Common Tunnel Inspection Work Order. Updates to the PM shall be made within the EAM system.

VIII. PROCEDURES FOR REPAIRS RESULTING FROM COMMON TUNNEL INSPECTIONS

1. Repair Procedure for the Hot Patch of the Common Tunnel

The common tunnel is often repaired using a hot patch method. Hot patching can be achieved through windows, or access points, along the common tunnel. In an area where this is not possible, the common tunnel may be separated from the uptakes. After separating the common tunnel from the uptakes, the common tunnel section requiring a hot patch is drilled to pierce the interior refractory, following a predetermined anchor pattern. Once drilled, anchors are inserted and welded to the metal shell. Gunnite material is sprayed along the sides of the tunnel first, working up towards the top. After the gunnite material dries and, upon inspection appears stable, the uptake section is reattached.

This procedure is an example of one method used for repairing the common tunnel, though other methods may be used, as appropriate, such as cutting out and replacing an entire section.

2. Selective Replacement of the Common Tunnel

In the event that repairs of the common tunnel are unsuccessful, selective replacement of sections of the tunnel shall be made, as needed to ensure negative pressure within the common tunnel. The damaged section of the common tunnel is cut out and removed by crane and, a new piece is set into place.

IX. ADDITIONAL COMMON TUNNEL DIFFERENTIAL PRESSURE CELLS (CONSENT DECREE IV.D.23.a.iii.)

Differential pressure (dP) cells are used to ensure that the common tunnel maintains negative pressure during operations. Supplemental to the dP cells previously installed, as of Q1 2018, additional common tunnel differential pressure (DP) cells have been installed at approximately the midpoint between each Bypass Vent Stack on each respective battery. All currently installed common tunnel differential pressure cells are summarized in the following table:

Table 4. Summary of Common Tunnel dP Cell Locations

A Battery	B Battery	C Battery	D Battery
North End of A Common Tunnel	North End of B Common Tunnel	North End of C Common Tunnel	North End of D Common Tunnel
North Side of Stack A1	North Side of Stack B1	North Side of Stack C1	North Side of Stack D1
South Side of Stack A1	South Side of Stack B1	South Side of Stack C1	South Side of Stack D1
Midpoint Between Stacks A1 and A2	Midpoint Between Stacks B1 and B2	Midpoint Between Stacks C1 and C2	Midpoint Between Stacks D1 and D2
North Side of Stack A2	North Side of Stack B2	North Side of Stack C2	North Side of Stack D2
South Side of Stack A2	South Side of Stack B2	South Side of Stack C2	South Side of Stack D2
End of Common Tunnel, South of Stack A2	Midpoint Between Stacks B2 and B3	Midpoint Between Stacks C2 and C3	Midpoint Between Stacks D2 and D3
End of Common Tunnel, North of Stack A3			
North Side of Stack A3	North Side of Stack B3	North Side of Stack C3	North Side of Stack D3
South Side of Stack A3	South Side of Stack B3	South Side of Stack C3	South Side of Stack D3
Midpoint Between Stacks A3 and A4	Midpoint Between Stacks B3 and B4	Midpoint Between Stacks C3 and C4	Midpoint Between Stacks D3 and D4
North Side of Stack A4	North Side of Stack B4	North Side of Stack C4	North Side of Stack D4
South Side of Stack A4	South Side of Stack B4	South Side of Stack C4	South Side of Stack D4
South End of A Common Tunnel	South End of B Common Tunnel	South End of C Common Tunnel	South End of D Common Tunnel

The differential pressure readings of the common tunnels, measured continuously, are visible within IHCC's Distributed Control System (DCS). In the event that pressure readings are positive, troubleshooting is performed to identify and correct the cause. These differential pressure cells are calibrated, on a quarterly basis through zero point checks, with additional checks performed as needed.

X. TRAINING OF OPERATORS (CONSENT DECREE IV.D.23.a.iv.)

All IHCC personnel, new employees, and employees transferred to a new job function will be trained for their specific job function and their respective environmental requirements. Training is refreshed on an annual basis for the required personnel. Refresher trainings are completed as needed. Field training may also be used in lieu of classroom training.

IHCC will train responsible personnel, including, but not limited to, Product Technicians/Burners, PCM Operators, and Oven Inspectors, to visually identify Coke Oven Leaks and Coke Oven health indicators. Training provides attendees with examples of Coke Oven Leaks and describes recordkeeping and corrective action requirements. For required IHCC personnel and/or contractors, Method 9 training is conducted by an external third party, in accordance with Method 9 requirements.

A. Product Technicians/Burners

Product Technicians/Burners are internally trained in the proper operation of the oven dampers, including door holes, sole flues, and uptakes, in order to maintain negative pressure in the ovens and common tunnel and optimal coke oven equilibrium, maximizing coke oven life, as well as their environmental requirements. Daily inspections of the oven condition are documented on Attachment I and submitted into the Shift Team Leader or Shift Manager at the end of their respective shift. Product Technicians/Burners are trained to identify a coke oven leak as any visible emissions, such as flames and/or smoke, from any part of the oven outside the door (i.e. buckstays, roof/crown, lintel, etc.). Training regarding coke oven leaks includes:

- P/S of Ovens – All door leaks observed at any time during the coking cycle must be corrected within fifteen (15) minutes of identification.
- C/S of Ovens – All door leaks under the shed observed at any time during the coking cycle must be corrected within forty-five (45) minutes of identification.
- All Other Coke Oven Leaks (i.e. Crown) – All other coke oven leaks, outside the doors, observed from the ground at any time during the coking cycle must be corrected within thirty (30) minutes of identification. If crown leaks exceed thirty (30) minutes, the procedures for Method 9 readings, when applicable, must be followed.

Product Technicians/Burners are trained to properly complete the Coke Oven Checklist and Coke Oven Leak Record Sheet, included as Attachment I. The information record requires the oven number, the leak observed time, the leak end time, the cause (if known), corrective actions implemented to stop the leak, whether or not the leak was caused by adverse wind conditions, and the location of the leak. This form is submitted by the Product Technician/Burner into their respective Team Leader or Shift Manager for review.

Product Technicians/Burners are trained that all observed coke oven leaks must be responded to and properly documented. Training records for all trainees shall be maintained for five years.

B. PCM Operators

PCM Operators are internally trained in the identification and documentation of door leaks observed on their operational pushing report. This includes whether or not a leak was observed, the corrective actions implemented to mitigate and stop the leak, and the terminal time of the leak. Training records for all trainees will be maintained for five years.

C. Oven Inspectors

Oven inspectors utilize internal training to ensure the document inspection procedures are properly followed to ensure all necessary repairs can be identified and adequately made. Initial training shall include a presentation with example images for repair priority designations: minimal, moderate, and severe. This presentation reviews images of each oven component investigated. Meetings among the oven team personnel are held to review previous inspections to ensure sufficient knowledge.

XI. VISUAL INSPECTION OF EACH OVEN EXTERIOR (CONSENT DECREE IV.D.23.a.v.)

On a daily basis, a visual inspection of the exterior ends of the ovens, from the ground, must be made and documented to identify Coke Oven Leaks. Daily inspections, at a minimum, are documented by the Product Technician/Burner and maintained in accordance with record keeping requirements. Utilizing the Coke Oven Checklist and Coke Oven Leak Record Sheet, included as Attachment I, the daily shift inspection record includes the following:

- Inspection of the door and crown for leaks from the P/S of the oven
- Inspection of the door and crown for leaks from the C/S of the oven
- Inspection for leaks outside the shed on the C/S side
- Other comments the Product Technician/Burner may have identified during their visual inspection

In the event that an Oven Leak is observed during the operator's shift inspection, the record information requires the oven number, the leak observed time, the leak end time, the cause (if known), corrective actions implemented to stop the leak, whether or not the leak was caused by adverse wind conditions, and the location of the leak. In the event that adverse wind conditions are the cause of a Coke Oven Leak, the wind speed and direction are documented. This form, included as Attachment J, is submitted by the Product Technician/Burner into their respective Team Leader or Shift Manager for review. An additional oven leak form, used to document Coke Oven Leaks occurring outside of these daily inspections, is included as Attachment H – IHCC Coke Oven Leak Record. These forms are maintained physically and/or electronically, in accordance with recordkeeping requirements.

As part of the daily inspections described in Section XI, operators will also inspect the Oven Crown. In the event that opacity lasting more than 30 minutes is observed at the oven, a Method 9 reading will be performed to determine the opacity, provided conditions identified in Method 9 allow for an observation pursuant to Method 9. Method 9 will be conducted by certified observers, using a third party if practicable. The forms used to record the Method 9 opacity readings are included as Attachment G – Method 9 Inspection Form.

XII. PERIODICALLY CONFIRM METHOD 9 OPACITY READINGS DURING TRAINING (CONSENT DECREE IV.D.23.a.vi.)

In the course of training employees in performing Method 9 opacity readings, USEPA Alternative Method 082 shall be used annually to confirm the Method 9 opacity readings.

IHCC will use a third party "smoke school" to train employees in performing the Method 9 opacity readings. In addition, during training activities, the USEPA Alternative Method 082 may be conducted by the third party "smoke school" using their own equipment to confirm the Method 9 readings conducted by trainees. Any training records, certification forms, and/or inspection forms from the third party "smoke school" will be sent to the Environmental Manager for recordkeeping (either physically or electronically).

XIII. DAILY OPERATION CHECKLIST (CONSENT DECREE IV.D.23.a.vii.)

On a daily basis, an operation checklist, titled Coke Oven Checklist and Coke Oven Leak Record Sheet, and included as Attachment I, is completed by the Product Technician/Burner and maintained in accordance with record keeping requirements. The checklist includes the following:

- Inspection of the door and crown for leaks from the P/S of the oven
- Inspection of the door and crown for leaks from the C/S of the oven
- Inspection for leaks outside the shed on the C/S side
- Other comments the Product Technician/Burner may have identified during their visual inspection

In the event that a Coke Oven Leak is observed during the operator's shift, the record information requires the oven number, the leak observed time, the leak end time, the cause (if known), corrective actions implemented to stop the leak, whether or not the leak was caused by adverse wind conditions (in accordance with the Consent Decree), and the location of the leak. This form, included as Attachment I, is submitted by the Product Technician/Burner into their respective Team Leader or Shift Manager for review. An additional oven leak form, used to document coke oven leaks occurring outside of these daily inspections, is included as Attachment H – IHCC Coke Oven Leak Record. These forms are maintained physically and/or electronically, in accordance with recordkeeping requirements.

XIV. ONGOING MAINTENANCE AND REPAIRS (CONSENT DECREE IV.D.23.a.viii.)

Ongoing maintenance and repairs are tracked as part of the EAM software system, including but not limited to items identified by the daily operation checklist, titled Coke Oven Checklist and Coke Oven Leak Record Sheet, and included as Attachment I. Examples of recommended repairs are provided in Table 5. This table is for example purposes only; this PMO Plan will not be updated to reflect changes to this table.

Table 5. Summary of Ongoing Maintenance and Repairs

Maintenance Repair	Trigger for Repair	Recommended Repairs
Lintel Repair	Bad Lintel	Patch and Schedule Repair
Cam Bolts Replacement	Damaged/Missing Cam Bolts	Replace Cam Bolts
Door/Refractory	Bad Door/Missing Refractory	Replace Door
Blocks Replacement	Broken Blocks	Replace Blocks
Restore Power to Unit	No Power to Unit	Restore Power
Changing Damper Block	Cracking, Missing, or Drifting from Set Positions	Repair/replace damper block
Hot Patch Door	Hot Spots	Patch the refractory
Insulating the Crown	Damaged Crown Arches, Loose or Fallen Crown Brick	Replace the ceramic wool and/or brick
Ceramic Welding Repair	Cracked Refractory Brick	Fill cracks/holes via ceramic welding

XV. COORDINATION OF MAINTENANCE TO MINIMIZE BYPASS VENTING (CONSENT DECREE IV.D.23.a.ix.)

IHCC will coordinate with Cokenergy to minimize Bypass Venting. IHCC will make every effort to conduct maintenance that requires Bypass Venting during times when Cokenergy is conducting maintenance that requires Bypass Venting on one or more stacks. IHCC will review the Cokenergy HRSG outage schedule and, where practicable, schedule maintenance work to coincide with Cokenergy's work in a way that minimizes overall Bypass Venting.

XVI. RECORDKEEPING AND REPORTING (CONSENT DECREE IV.D.23.a.x.)

IHCC will maintain and make available for inspection the applicable records, logs, and/or reports maintained physically and/or electronically, as required by the Consent Decree. This documentation includes records detailing observed individual Coke Oven Leaks, Oven health indicators such as "Minimum", "Moderate", and "Severe", and any maintenance or repairs performed in response to Coke Oven Leaks. IHCC's recordkeeping and reporting obligations pertaining to regulatory requirements, except for the Consent Decree, are maintained in other IHCC plans and/or permits associated with the applicable regulation.

In addition, IHCC will submit semiannual progress reports to the USEPA and IDEM pursuant to the Consent Decree. These reports will include a copy of any updates to this PMO Plan, if applicable.

XVII. COMPLIANCE ASSURANCE PLAN

This section provides the Compliance Assurance Plan (CAP) to address potential periods of higher production levels, as follows. IHCC will evaluate the monthly production and monthly sulfur content of dry coal to identify whether they exceed both of the levels indicated by either Trigger 1 or Trigger 2 in the following chart in two consecutive months (High Production Level Months).

Level Description	Trigger 1	Trigger 2
Average Monthly Sulfur Content of Dry Coal	Between 0.7% and 0.9%	>0.9%
Average Monthly Tons of Dry Coal Charged	144,000	128,000

To identify High Production Level Months, the planned monthly production throughput will be evaluated with the previous month's average coal quality analyses. The monthly production and monthly quality averages for coal, including, but not limited to, sulfur and moisture content, will be tracked using a running log.

In conjunction with the Emission Tracking Software (ETS), the monthly production and monthly quality averages will be used to evaluate whether subsequent High Production Level Months may cause exceedances of particulate matter (PM) or sulfur dioxide (SO_2) limits. The calculated emissions will be compared to PM and SO_2 emissions limits set forth in the IHCC Air Permit and the Consent Decree in the Daily Compliance Status Report, an output of the ETS. The Daily Compliance Status Report and Monthly Sulfur Balance Report from the ETS will be maintained.

During subsequent High Production Level Months, IHCC will utilize ETS calculations to estimate if exceedances of PM Emissions or SO_2 emission limits may occur and respond accordingly. The following figures, used only for illustrative purposes, summarize the parameters used as the basis for SO_2 and PM Emissions:

Figure 1. Illustrated Parameters Used to Determine SO_2 Rate

<table>
<tr><th>These Variables:</th><th>Determine:</th><th>Which Determine:</th><th>Which Determine:</th></tr>
<tr><td>HRSG Actual Steam Rate</td><td rowspan="2">Percent Gas Vented</td><td rowspan="4">Vented SO_2 Rate</td><td rowspan="5">Total SO_2 Rate</td></tr>
<tr><td>HRSG Potential Steam Rate</td></tr>
<tr><td>Coal Sulfur</td><td rowspan="2">Potential SO_2 Emission Factor</td></tr>
<tr><td>Coke Sulfur</td></tr>
<tr><td colspan="2">Production Rate</td></tr>
<tr><td colspan="2">Main Stack SO_2 Concentration</td><td rowspan="2">Main Stack SO_2 Rate</td></tr>
<tr><td colspan="2">Main Stack Gas Flow</td></tr>
</table>

Figure 2. Illustrated Parameters Used to Determine PM Emissions Rate

<table>
<tr><th>These Variables:</th><th>Determine:</th><th>Which Determine:</th><th>Which Determine:</th></tr>
<tr><td>HRSG Actual Steam Rate</td><td rowspan="2">Percent Gas Vented</td><td rowspan="3">Vented PM Emissions Rate</td><td rowspan="4">Total PM Emission Rates</td></tr>
<tr><td>HRSG Potential Steam Rate</td></tr>
<tr><td colspan="2">Production Rate</td></tr>
<tr><td colspan="2">Uncontrolled PM Emissions Factor</td><td rowspan="2"></td></tr>
<tr><td colspan="3">Main Stack PM Emissions Rate</td></tr>
</table>

IHCC will coordinate with Cokenergy to comply with PM Emissions and SO_2 applicable limits. These responses include, but are not limited to, ensuring Bypass Venting Stacks are properly closed, and ensuring sufficient SO_2 scrubbing or optimized spray dryer operation with Cokenergy.

XVIII. ROOT CAUSE FAILURE ANALYSIS

IHCC utilizes RCFA techniques to investigate Coke Oven Leaks. The RCFA process helps address issues by identifying and implementing corrective actions for the root causes of events. By focusing on the root cause, the likelihood of recurrences can be reduced.

The primary aim of an RCFA is to identify the contributory (causal) factors that resulted in the nature, magnitude, and location of one or more past Coke Oven Leaks. By establishing causal factors, IHCC can identify potential actions, inactions, and/or conditions that may be modified to reduce the likelihood of recurrence of similar outcomes. In addition, the RCFA process is used to identify the lessons to be learned to promote continuous improvement. A team-based approach towards conducting an RCFA may be utilized, and the investigation will endeavor to understand the relationships between potential root cause(s) and resulting failure(s) to minimize the likelihood of recurrence.

One of two RCFAs will be conducted for every Coke Oven Leak and shall contain the information outlined below:

A. Summary RCFA

If IHCC determines that any of the Coke Oven Leaks triggering the RCFA were caused by high winds, equipment maintenance or malfunction that is unrelated to Structural Issues with the Oven, impacts from another Oven within the same bank of 16 or 17 Ovens, or acts or omissions not related to equipment owned or operated by IHCC or Cokenergy, then IHCC shall conduct a Summary RCFA that includes, at a minimum:

a. The date and time that the Coke Oven Leaks were observed, and the duration of the Leaks, to the extent known;

b. If the Coke Oven Leaks were caused by high winds, i.e., adverse wind conditions, identification of wind speed and direction data for the time of the Coke Oven Leaks;

c. If the Coke Oven Leaks were caused by impacts from adjacent Ovens, identification of the causes of those impacts;

d. Identification of any actions taken to stop the Coke Oven Leaks; and

e. A description of corrective action(s) available to IHCC that are necessary to prevent or reduce the likelihood of a recurrence of Coke Oven Leaks at the Oven and the date of implementation of the corrective action(s).

B. Full RCFA

For Coke Oven Leaks triggering an RCFA that are not addressed by a Summary RCFA, IHCC will communicate with Cokenergy when conducting the Full RCFA that includes, at a minimum:

a. The date and time that the Coke Oven Leaks were observed, and the duration of the Leaks, to the extent known. If the Coke Oven Leaks involved multiple time periods of emissions, the starting and ending dates and times of each time period shall be set forth, to the extent known;

b. Identification of any actions taken to stop the Coke Oven Leaks;

c. A detailed analysis that sets forth the root cause(s) and all contributing causes of the Coke Oven Leaks, to the extent determinable, and the steps, if any, that were taken to limit the duration and/or quantity of emissions associated with the Coke Oven Leaks;

d. An analysis of the measures, if any, that are reasonably available to prevent or reduce the likelihood of a recurrence of Coke Oven Leaks resulting at the Coke Oven from the same root cause(s) and contributing causes in the future. The analysis shall evaluate design, operational, and maintenance changes, if any; the probable effectiveness of each such measure; the likely cost of each measure; whether or not an outside consultant should be retained to assist in the analysis; and whether the same issue would have an impact on other Ovens;

e. A description of correction actions(s) implemented and the date of implementation of the corrective action(s), or, if not already implemented, a schedule for their implementation, including proposed commencement and completion dates, or an explanation that corrective action(s) is (are) not required;

f. To the extent that investigations of the causes and/or possible corrective actions still are underway on the due date of the semi-annual report, a statement of the anticipated date by which a follow-up report fully conforming to the requirements of this Paragraph will be submitted; provided, however, that if a report or a series of reports containing the information required to be submitted under this Paragraph is not submitted within sixty (60) Days (or such additional time as USEPA may allow) after the semi-annual reporting period during which the RCFA is to be submitted, the stipulated penalty provisions of Section IX (Stipulated Penalties) of the Consent Decree shall apply for failure to timely submit the report. Nothing in this Paragraph shall be deemed to excuse investigation, reporting, and corrective action obligations under this Section for any Coke Oven Leak RCFA Trigger Level that occurs after another Coke Oven Leak RCFA Trigger Level for which an extension of time is requested under this Paragraph; and

g. To the extent that completion of the implementation of corrective action(s), if any, is not finalized at the time of the submission of the report required under this Paragraph, the status of the correction actions will be reported in subsequent semi-annual reports until the status has been reported as complete.

Action items from RCFAs are assigned to individuals to complete items and are tracked. The status of action items is periodically reviewed by IHCC's leadership team.

XIX. ENVIRONMENTAL: MANAGEMENT OF CHANGE

At times, certain changes to IHCC assets or operational practices that involve significant changes to process, mechanical, civil, electrical or technological specifications are managed using the EAM system Management of Change (MOC) process.

The originator of a MOC must provide the basis for the change (provide the scope) which includes the description of why a change is being proposed and what improvements or benefits are expected (provide the justification). This information is included for all MOCs and is provided during the origination phase of a MOC record.

The MOC system coordinator assigns one or more subject matter experts to review the change. The review team will include the site Environmental Manager, or their designee, whenever a process change is being proposed that involves environmental media or a process with environmental implications. A predefined list of environmental consequences may be utilized during the review and is included as Attachment J – Environmental: Management of Change. The change will also be subjected to technical analysis for adherence to good engineering design standards and to ensure the proposed design is safe, reliable, cost-effective and environmentally sound. MOC reviewers can assign follow up actions that must be completed prior to implementation of the change. Subject matter experts or their designees review and approve any changes prior to implementation.

XX. ROLES AND RESPONSIBILITIES

General Manager – Overall responsibility for all facets of the IHCC facility. Related to the PMO Plan, the General Manager ensures that trained and qualified persons are assigned as the process owners of the MOC and RCFA work processes at the site. The General Manager shall ensure that RCFAs are conducted and reviewed.

Operations Manager – Overall responsibility for all operational activities at IHCC. Related to the PMO Plan, the Operations Manager ensures that Coke Oven Leak and other operational procedures are readily available, understood, and properly executed by operations personnel. Responsible for providing or directing personnel to provide timely communication of Coke Oven Leaks at Rebuilt Ovens.

Maintenance Manager – Overall responsibility for the plant maintenance process at IHCC. Related to the PMO Plan, the Maintenance Manager ensures that job plan tasks are sufficient to provide reliability and reduce the likelihood of Coke Oven Leaks. Responsible for verifying PM completion, reporting PM compliance and developing action plans. Reviews the outage schedule and coordinating maintenance with Cokenergy, as described in Section XV.

Environmental Manager – Overall responsibility for all environmental aspects at IHCC. Ensures that all events are reported in accordance with the IHCC Air Permit, Consent Decree, and the requirements of 40 CFR 63.10(d)(5)(ii) and 40 CFR 63.7341(d). Maintains applicable physical and/or electronic records, logs, reports, and/or notifications pertaining to permit and Consent Decree requirements. Prepares periodic reports for Coke Oven Leaks to the USEPA and IDEM as part of the semi-annual compliance certifications required under Paragraph 51 of the Consent Decree and paragraphs 63.311(d) and 63.7341(c) of 40 CFR 63, Subpart L and Subpart CCCCC, respectively. Reviews the field documentation for all environmental critical PM tasks to ensure proper follow up actions are taken.

Production Maintenance Coordinator or Designee – Overall responsibility for scheduling maintenance work and critical PM tasks at IHCC. Ensures that process equipment is available for scheduled work and that work order quality (content and codification) is in compliance with work process standards prior to release to maintenance.

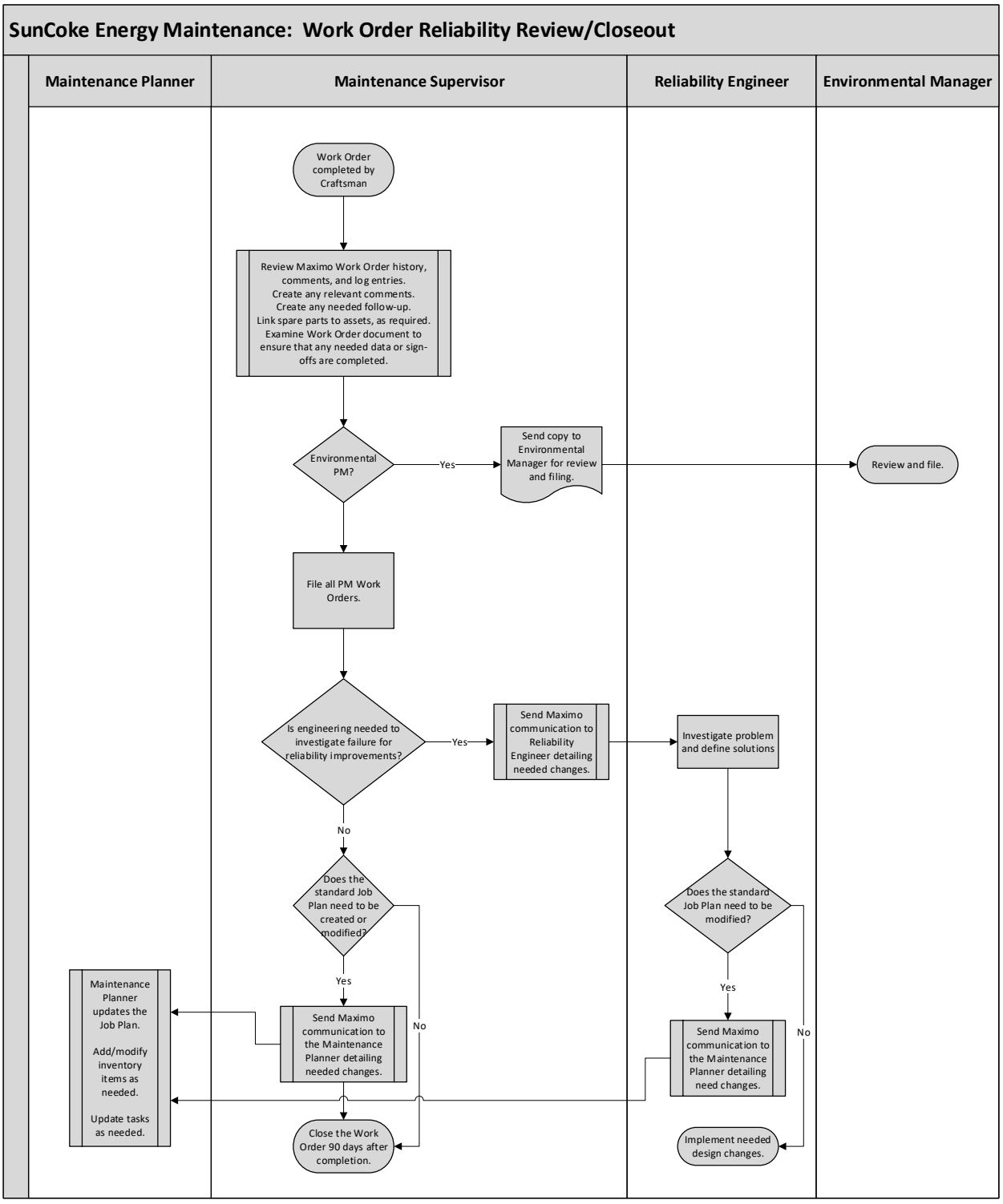
XXI. PMO PLAN MODIFICATIONS OR REVISIONS

Modifications may be made to this PMO Plan as necessary to satisfy applicable requirements or to reflect changes in equipment or procedures. In accordance with Paragraph 23 and Section VIII of the Consent Decree, changes to this PMO Plan related to minimizing Coke Oven Leaks shall be summarized and reported to USEPA and IDEM in the subsequent semi-annual periodic report. Such changes may be implemented immediately, but nonetheless shall be subject to the approval of USEPA in accordance with the Consent Decree. The PMO Plan revisions will be documented in Attachment K – PMO Plan Document Control Form.

ATTACHMENT A – EXAMPLE LIST OF ENVIRONMENTAL CRITICAL PM

PM	Description	Location
1499	PM IH A Battery Sole Flue Inspection	010A
1500	PM IH B Battery Sole Flue Inspection	010B
1501	PM IH C Battery Sole Flue Inspection	010C
1821	PM IH D Battery Sole Flue Inspection	010D
4645	PM IH A Battery Semi-Annual Tie Rod Inspection	STR-10A
4646	PM IH B Battery Semi-Annual Tie Rod Inspection	STR-10B
4647	PM IH C Battery Semi-Annual Tie Rod Inspection	STR-10C
4648	PM IH D Battery Semi-Annual Tie Rod Inspection	STR-10D
4896	PM IH A-Battery Maintenance Inspection of Common Tunnel 'Hot Spots'	TU-A
4573	PM IH B-Battery Maintenance Inspection of Common Tunnel 'Hot Spots'	TU-B
5087	PM IH C-Battery Maintenance Inspection of Common Tunnel 'Hot Spots'	TU-C
5088	PM IH D-Battery Maintenance Inspection of Common Tunnel 'Hot Spots'	TU-D
5202	Oven Door Inspection A-Battery	010A
5203	Oven Door Inspection B-Battery	010B
5204	Oven Door Inspection C-Battery	010C
5205	Oven Door Inspection D-Battery	010D
5380	Thermography Scan of A Battery Common Tunnel	010A
5381	Thermography Scan of B Battery Common Tunnel	010B
5382	Thermography Scan of C Battery Common Tunnel	010C
5383	Thermography Scan of D Battery Common Tunnel	010D
5461	PM IH A-Battery EV Stack Transition 'Hot Spot' Inspection	EVS-A
5462	PM IH B-Battery EV Stack Transition 'Hot Spot' Inspection	EVS-B
5463	PM IH C-Battery EV Stack Transition 'Hot Spot' Inspection	EVS-C
5464	PM IH D-Battery EV Stack Transition 'Hot Spot' Inspection	EVS-D
7154	PM IH A-Battery Mechanical Inspection	STR-10A
7155	PM IH B-Battery Mechanical Inspection	STR-10B
7156	PM IH C-Battery Mechanical Inspection	STR-10C
7159	PM IH D-Battery Mechanical Inspection	STR-10D
8144	A Battery Oven Chamber Bi-Annually Inspections	010A
8145	B Battery Oven Chamber Bi-Annually Inspections	010B
8146	C Battery Oven Chamber Bi-Annually Inspections	010C
8147	D Battery Oven Chamber Bi-Annually Inspections	010D
8149	A-Battery Oven Crown Area	010A
8153	B-Battery Oven Crown Area	010B
8154	C-Battery Oven Crown Area	010C
8155	D-Battery Oven Crown Area	010D

ATTACHMENT B – PM WORKFLOW PROCESS



ATTACHMENT C – OVEN HEALTH INSPECTION SUMMARY FORM – SOLE FLUE

OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
1	1 SHORT CHAMBER		1	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
2	1 SHORT CHAMBER		2	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
3	1 SHORT CHAMBER		3	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
4	1 SHORT CHAMBER		4	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
5	1 SHORT CHAMBER		5	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
6	1 SHORT CHAMBER		6	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
7	1 SHORT CHAMBER		7	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
8	1 SHORT CHAMBER		8	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
9	1 SHORT CHAMBER		9	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
10	1 SHORT CHAMBER		10	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
11	1 SHORT CHAMBER		11	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
12	1 SHORT CHAMBER		12	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
13	1 SHORT CHAMBER		13	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
14	1 SHORT CHAMBER		14	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
15	1 SHORT CHAMBER		15	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
16	1 SHORT CHAMBER		16	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
17	1 SHORT CHAMBER		17	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
18	1 SHORT CHAMBER		18	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
19	1 SHORT CHAMBER		19	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES

ATTACHMENT C (CONTINUED) – OVEN HEALTH INSPECTION SUMMARY FORM – SOLE FLUE

20	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		20	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
21	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		21	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
22	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		22	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
23	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		23	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
24	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		24	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
25	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		25	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
26	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		26	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
27	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		27	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
28	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		28	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
29	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER		29	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
30	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		30	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
31	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		31	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
32	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		32	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
33	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		33	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
34	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		34	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
35	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		35	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
36	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		36	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
37	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		37	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
38	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		38	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
39	1 SHORT CHAMBER 2 INSPECTION CHAMBER 3 DAMPER CHAMBER 4 LONG CHAMBER		39	1 LONG CHAMBER 2 DAMPER CHAMBER 3 INSPECTION CHAMBER 4 SHORT CHAMBER	

ATTACHMENT C (CONTINUED) – OVEN HEALTH INSPECTION SUMMARY FORM – SOLE FLUE

OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
40	1 SHORT CHAMBER		40	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
41	1 SHORT CHAMBER		41	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
42	1 SHORT CHAMBER		42	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
43	1 SHORT CHAMBER		43	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
44	1 SHORT CHAMBER		44	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
45	1 SHORT CHAMBER		45	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
46	1 SHORT CHAMBER		46	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
47	1 SHORT CHAMBER		47	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
48	1 SHORT CHAMBER		48	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
49	1 SHORT CHAMBER		49	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
50	1 SHORT CHAMBER		50	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
51	1 SHORT CHAMBER		51	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
52	1 SHORT CHAMBER		52	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
53	1 SHORT CHAMBER		53	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
54	1 SHORT CHAMBER		54	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
55	1 SHORT CHAMBER		55	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
56	1 SHORT CHAMBER		56	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
57	1 SHORT CHAMBER		57	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
58	1 SHORT CHAMBER		58	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
59	1 SHORT CHAMBER		59	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	

ATTACHMENT C (CONTINUED) – OVEN HEALTH INSPECTION SUMMARY FORM – SOLE FLUE

OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
60	1 SHORT CHAMBER		60	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
61	1 SHORT CHAMBER		61	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
62	1 SHORT CHAMBER		62	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
63	1 SHORT CHAMBER		63	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
64	1 SHORT CHAMBER		64	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
65	1 SHORT CHAMBER		65	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
66	1 SHORT CHAMBER		66	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	
OVEN	FLUE	ISSUES	OVEN	FLUE	ISSUES
67	1 SHORT CHAMBER		67	1 LONG CHAMBER	
	2 INSPECTION CHAMBER			2 DAMPER CHAMBER	
	3 DAMPER CHAMBER			3 INSPECTION CHAMBER	
	4 LONG CHAMBER			4 SHORT CHAMBER	

ATTACHMENT D – OVEN HEALTH INSPECTION SUMMARY FORM – MECHANICAL

Oven	Air Space Beam	Left Buckstay	Right Buckstay	End Wall Beam	Left Jamb Plate	Right Jamb Plate	Lintel Plate	Bench	Door	Sill Beam	Sole Flue Damper	Top Tie Rods	No Springs on Top	Split Bladle on Top	Bottom Tie Rods
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2															
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66															
67															

The Items With The Most Damage				
	Worst to Least			
Air Space Beams	0	0	0	
Left Buckstay	0	0	0	
Right Buckstay	0	0	0	
End Wall Beam	0	0	0	
Left Jamb Plate	0	0	0	
Right Jamb Plate	0	0	0	
Lintel Plate	0	0	0	
Bench	0	0		
Door	0	0	0	
Sill Beam	0	0	0	
Sole Flue Damper	0	0	0	
Top Tie Rods	0	0	0	0
Bottom Tie Rods			0	0

ATTACHMENT E – OVEN HEALTH INSPECTION SUMMARY FORM – OVEN CHAMBER

Ovens	Left down comer arches	Right down comer arches	Carbon (inches)	Left down comer cracks	Right down comer cracks	Left uptake cracks	Right uptake cracks	Crown	Wall erosion	Coke side lintel	Pusher side lintel	Left pusher side jamb	Right pusher side jamb	Pusher side sill
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67														

Not Available

Cracks
0-Good
1-Minimum
2-Cracks with gas flow
3-Cracks/holes with material passing thru

Lintels/Jambs/Sills
0-Good
1-Minimum damage, no steel exposed
2-Moderate damage, steel exposed/Repair
3-Severe refractory and steel damage/Replace

Wall Erosion
0-Good
1-Minimum damage
2-Moderate damage
3-Severe damage

ATTACHMENT F – COMMON TUNNEL INSPECTION WORK ORDER

SunCoke Energy
The Higher Degree

Work Order Details 1086667: D-battery oven crown area

Inspection of oven crown area looking for cracks, openings in crowns, uptake piers, holes in elbows, dampers and transitions.

Asset: 43624 BATTERY D
Location: 010D BATTERY D

Sched Start:		Site: IH		Job Plan: 9342	
Sched Finish:		Priority:		Supervisor: DWLEROUX	
Target Start: 4/29/18		Work Type: PM		Lead:	
Target Finish: 4/30/18		Status: COMP		Crew:	
		Parent:			
		Failure Class: OVEN			
Report Date: 4/24/18		Problem Code:			
Reported By: KDGRAPER					
		GL Account: 311.50642.101.111.000.000.0000			
				Frequency: 30	Units: DAYS

Task IDs

Task ID	Description	Status
10	Obtain Permission to access battery	COMP
	Coordinate access to the oven crown area and make sure that pushing and charging is not occuring within the vicinity of the oven area being inspected.	
	Complete SWP / STP for the site	
20	Perform Oven Exterior Inspection	COMP
	Perform oven exterior inspection in accordance with OV-PRO-0606--Oven Exterior Inspection	
	Conditional Classification folllow the Severe, Moderate, Minimal, and No Damage ranking system.	
30	Analysis and Reporting of the Results	COMP
	Analyze the crown data collected during the inspection and tabulate results into Oven Refractory Exterior Report	
40	Enter WO's for Severe Classification Conditions Recorded	COMP
	Enter WO's for Severe Classification Conditions Recorded during exterior inspection	

Planned Labor

Task ID	Craft	Skill Level	Labor	Vendor	Contract	Qty	Hours	Rate	Line Cost
10	OVENINSP					1	00:15	0.00	0.00

ATTACHMENT G – METHOD 9 INSPECTION FORM

SEC Method 9 VE Inspection Form

Date: _____
Source: _____
Observ. began: _____
Observ. ended: _____
Observed from: _____
Distance to source: _____ feet
Direction to source: _____
********** _____
Height of source: _____
Vert. angle to source: ********** _____
Plum type: _____ Attached

	Beginning	End
Emissions color:	*See comments*	*See comments*
Background color:		
Sky condition:		
Wind speed:		
Wind direction:		
Ambient temp.:		
Wet bulb temp.:	**********	**********
Rel. humidity %:		

Sheet: _____ of _____

Comments	0	15	30	45				0	15	30	45		Comments
						0	30						
						1	31						
						2	32						
						3	33						
						4	34						
						5	35						
						6	36						
						7	37						
						8	38						
						9	39						
						10	40						
						11	41						
						12	42						
						13	43						
						14	44						
						15	45						
						16	46						
						17	47						
						18	48						
						19	49						
						20	50						
						21	51						
						22	52						
						23	53						
						24	54						
						25	55						
						26	56						
						27	57						
						28	58						
						29	59						

Observers signature

Additional info.(include steam dissipation point if applicable):

_____
_____
_____
_____
_____
_____

SEC Method 9 VE Inspection Form

Attachment G (CONTINUED) – Method 9 INSPECTION FORM

USEPA METHOD 9
Criteria Determination

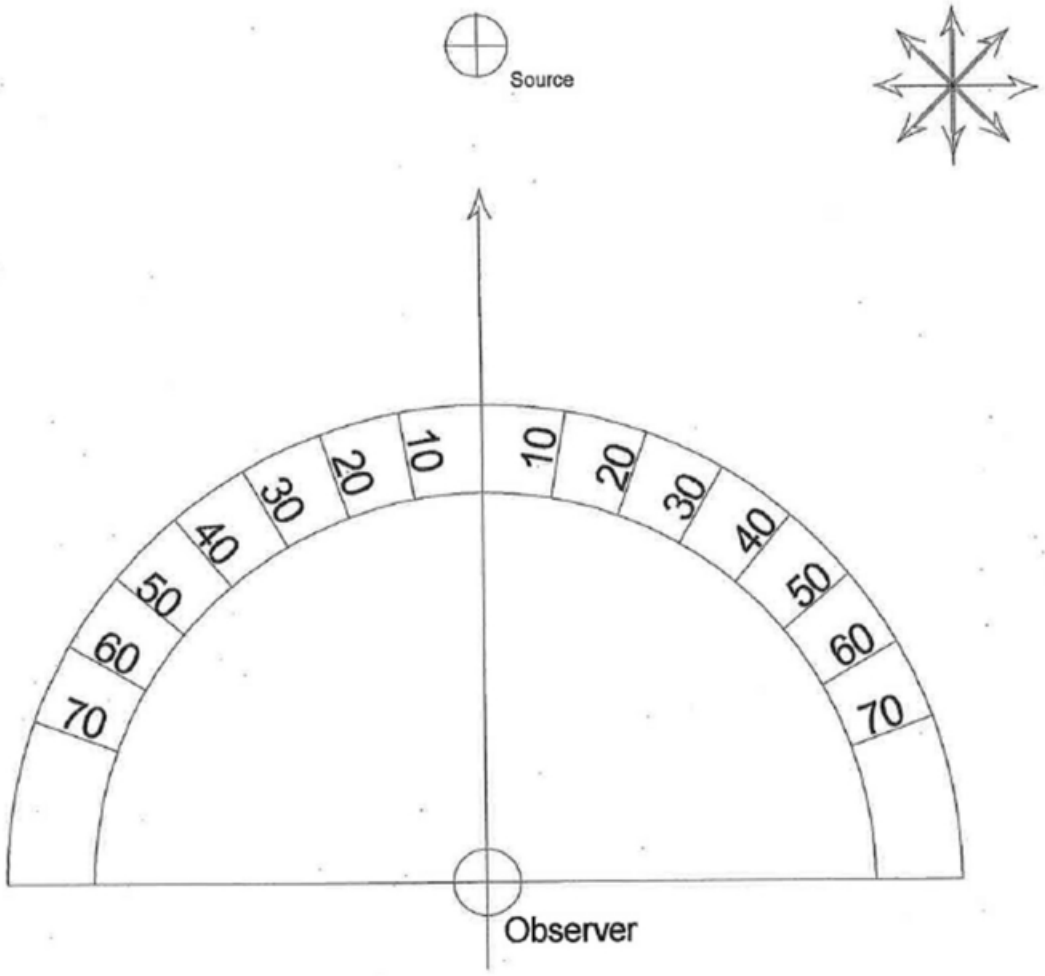
Date: _____

Observer: _____

Time Begin: _____

Time End: _____

Source Data: _____



Sun Visible During Inspection Yes ☐ No ☐

Use Only Blue or Black Ink

IHCC COKE OVEN LEAK RECORD

SunCoke Energy

DATE:

Coke Oven Leaks must be extinguished in: 15 min P/S; 45 min C/S; 30 min Crown

Record all times in 24 hour format		PUSHER SIDE (P/S)		COKE SIDE (C/S)		CORRECTIVE ACTIONS & CAUSE OF LEAK
OVEN	TIME LEAK NOTICED	DOOR LEAK	Leak Out Time	DOOR LEAK	Leak Out Time	WHAT WAS DONE TO CORRECT THE DOOR LEAK? WHAT WAS THE POTENTIAL CAUSE OF THE DOOR LEAK?
B44	12:45 PM	(Y) // N	6:35 PM	Y // (N)		Sole flues plugged & uptake blocked stuck / adjusted door dampers
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		
		Y // N		Y // N		

☐ No coke oven leaks were observed today (check this box if no coke oven leaks were observed)

For every coke oven leak, record the oven #, the time the door leak was noticed; and the time it was corrected. List the corrective actions that were taken and indicate if adverse wind conditions existed in the "Comments" section.
If you are the person who notices the door leak and calls the CCR operator, YOU are responsible for ensuring that the door leak is recorded.
Coke oven door leaks can be recorded on push reports or product tech coke oven leak record reports.

NOTE - Coke oven leaks are visible emissions that occur from the crown or a door's top, sides, dampers, or holes.

Product Technician IHCC COKE OVEN LEAK RECORDS must be submitted to the Shift Supervisor at the end of the DAY

Revised 06/22/2018

ATTACHMENT I – IHCC COKE OVEN CHECKLIST AND COKE OVEN LEAK RECORD SHEET

_____ Battery Ovens - IHCC COKE OVEN CHECKLIST INSPECTION RECORD

DATE: _____ SHIFT: _____

Supervisor Signature _____

Your signature indicates that all doors and crowns were inspected on

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Daily Inspection:
1. Inspect door and crown for leaks on the push side from the Pad
2. Inspect door leaks on the coke side from inside the shed
3. Inspect for leaks on the shed from the road
4. Inspect the uptakes of ovens to be charged prior to push to verify they can open to a minimum of 8" and able to close

Use Only Blue or Black Ink

OVEN #	Time of Inspection (AM or PM)	INITIALS	PUSHER SIDE	COKE SIDE	COKE SIDE	Uptake Functionality?		COMMENTS
			Inspect from Pad	Inside Shed	Outside Shed (from road)	30 - 60 minutes prior to production		Are there any uptakes not moving properly? Are all the thermocouples working? Are the door seating properly?
						Push	Coke	
E1	11:23 PM	JEB	X	X	X	(Y) / N	Y (N)	Coke side damper stuck at 6. Thermocouple on P/S out
1						Y // N	Y // N	
2						Y // N	Y // N	
3						Y // N	Y // N	
4						Y // N	Y // N	
5						Y // N	Y // N	
6						Y // N	Y // N	
7						Y // N	Y // N	
8						Y // N	Y // N	
9						Y // N	Y // N	
10						Y // N	Y // N	
11						Y // N	Y // N	
12						Y // N	Y // N	
13						Y // N	Y // N	
14						Y // N	Y // N	
15						Y // N	Y // N	
16						Y // N	Y // N	
17						Y // N	Y // N	
18						Y // N	Y // N	
19						Y // N	Y // N	
20						Y // N	Y // N	
21						Y // N	Y // N	
22						Y // N	Y // N	
23						Y // N	Y // N	
24						Y // N	Y // N	
25						Y // N	Y // N	
26						Y // N	Y // N	
27						Y // N	Y // N	
28						Y // N	Y // N	
29						Y // N	Y // N	
30						Y // N	Y // N	
31						Y // N	Y // N	
32						Y // N	Y // N	
33						Y // N	Y // N	
34						Y // N	Y // N	
35						Y // N	Y // N	
36						Y // N	Y // N	
37						Y // N	Y // N	
38						Y // N	Y // N	
39						Y // N	Y // N	
40						Y // N	Y // N	
41						Y // N	Y // N	
42						Y // N	Y // N	
43						Y // N	Y // N	
44						Y // N	Y // N	
45						Y // N	Y // N	
46						Y // N	Y // N	
47						Y // N	Y // N	
48						Y // N	Y // N	
49						Y // N	Y // N	
50						Y // N	Y // N	
51						Y // N	Y // N	
52						Y // N	Y // N	
53						Y // N	Y // N	
54						Y // N	Y // N	
55						Y // N	Y // N	
56						Y // N	Y // N	
57						Y // N	Y // N	
58						Y // N	Y // N	
59						Y // N	Y // N	
60						Y // N	Y // N	
61						Y // N	Y // N	
62						Y // N	Y // N	
63						Y // N	Y // N	
64						Y // N	Y // N	
65						Y // N	Y // N	
66						Y // N	Y // N	
67						Y // N	Y // N	

Product Technician to initial in the box provided if there were no Door/Crown Leaks observed during your shift

[ ] There were no Door/Crown Leaks observed during my shift

SUBMIT TO THE ENVIRONMENTAL DEPARTMENT AT THE END OF SHIFT

ALL OVENS THAT ARE OUT OF SERVICE SHOULD BE MARK AS "OOS" OR "EMPTY" OR "MAINTENANCE HOLD"
ENSURE THAT UPTAKES ARE CLOSED FOR ALL OUT OF SERVICE OVENS

Revised 06/22/2018

ATTACHMENT I (CONTINUED) – IHCC COKE OVEN CHECKLIST AND COKE OVEN LEAK RECORD SHEET

_____ Battery Ovens - IHCC COKE OVEN LEAK RECORD

DATE: _____ SHIFT: _____

Supervisor Signature _____

Your signature indicates that all door and crown leaks observed on on the battery were recorded during your shift and all Method 9 readings were collected as required.

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1. For every Door / Crown Leak, you must record the oven #, the times the leak was noticed and corrected, the potential cause & the corrective actions.
2. If a Crown Leak lasts more than 30 minutes, you must take a Method 9 Reading immediately (Refer to Method 9 sheet for instructions).
3. All Team Leaders must initial for each Door/Crown Leak recorded and sign in the designated area.

Use Only Blue or Black Ink

OVEN #	TIME FIRE NOTICED (AM or PM)	INITIALS	PUSHER SIDE Leak End Time Target: <15 minutes	COKE SIDE Leak End Time Target: <45 minutes	CROWN Leak End Time Target: <30 minutes		Wind Related?	Uptake Open?	Method 9 Reading Required? (Crown Leak >30 min)	Method 9 Reading Conducted?	Reasons for not conducting Method 9 (i.e. Sun Compliance)	Potential Cause & Corrective Actions What is the cause of the leak? What was done to correct the leak?
					Push Side	Coke Side						
E50	11:54 AM	JEB	12:05 PM	—	12:45 PM		Y /(N)	(Y)// N	(Y)// N	(Y)// N		Sole flue dampers adjusted, Increase draft Crown not properly sealed
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
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							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
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							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		
							Y // N	Y // N	Y // N	Y // N		

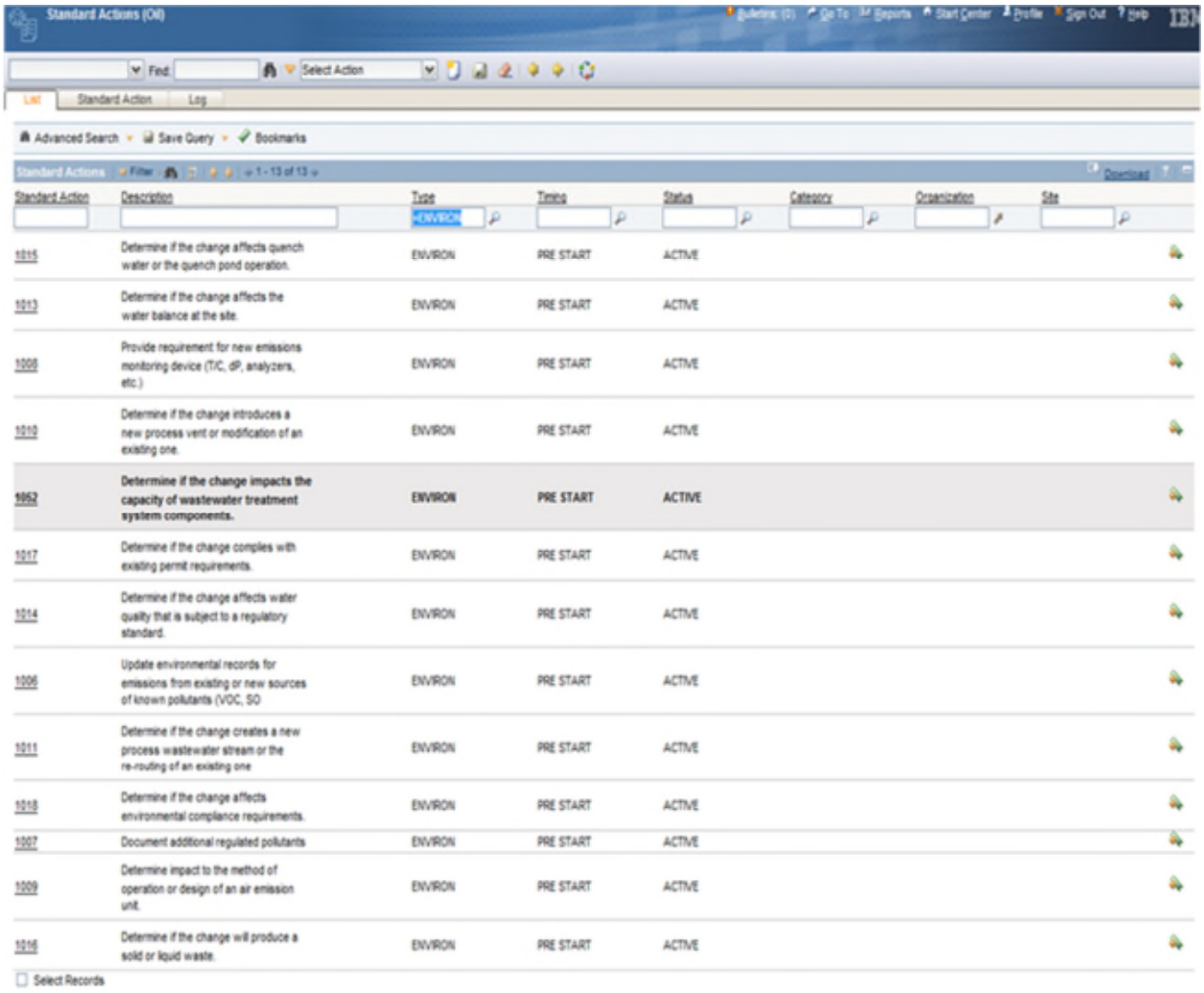
Wind Speed: _____

Wind Direction: _____

SUBMIT TO THE ENVIRONMENTAL DEPARTMENT AT THE END OF SHIFT

Revised 06/22/2018

ATTACHMENT J – ENVIRONMENTAL: MANAGEMENT OF CHANGE



Standard Action	Description	Type	Timing	Status	Category	Organization	Site
		ENVIRON					
1015	Determine if the change affects quench water or the quench pond operation.	ENVIRON	PRE START	ACTIVE			
1013	Determine if the change affects the water balance at the site.	ENVIRON	PRE START	ACTIVE			
1008	Provide requirement for new emissions monitoring device (T/C, dP, analyzers, etc.)	ENVIRON	PRE START	ACTIVE			
1010	Determine if the change introduces a new process vent or modification of an existing one.	ENVIRON	PRE START	ACTIVE			
1052	**Determine if the change impacts the capacity of wastewater treatment system components.**	**ENVIRON**	**PRE START**	**ACTIVE**			
1017	Determine if the change complies with existing permit requirements.	ENVIRON	PRE START	ACTIVE			
1014	Determine if the change affects water quality that is subject to a regulatory standard.	ENVIRON	PRE START	ACTIVE			
1006	Update environmental records for emissions from existing or new sources of known pollutants (VOC, SO	ENVIRON	PRE START	ACTIVE			
1011	Determine if the change creates a new process wastewater stream or the re-routing of an existing one	ENVIRON	PRE START	ACTIVE			
1018	Determine if the change affects environmental compliance requirements.	ENVIRON	PRE START	ACTIVE			
1007	Document additional regulated pollutants	ENVIRON	PRE START	ACTIVE			
1009	Determine impact to the method of operation or design of an air emission unit.	ENVIRON	PRE START	ACTIVE			
1016	Determine if the change will produce a solid or liquid waste.	ENVIRON	PRE START	ACTIVE			

ATTACHMENT K – PMO PLAN DOCUMENT CONTROL FORM

- *To be completed every time the PMO Plan is revised*
- *Provide reference to section(s) that have been revised under "Details of Revision"*

Issue	Date	Authorized	Details of Revision