JNE Consulting

Professional Engineers
ISO 9001:2015 Registered

Telephone: 412-963-1950 I Facsimile: 412-963-1618 I Email: info@jne.ca
103 Gamma Drive, #160, Pittsburgh, Pennsylvania, USA 15238 I Visit: jne.ca

Mr. Eric A. Gustafson
Regional Air Quality Program Manager
Pennsylvania Department of Environmental Protection, Northwest District Office
230 Chestnut Street
Meadville, Pennsylvania 16335-3481

Re: *In the Matter of Erie Coke Corporation* (Air Pollution Control Act)
Response to Administrative Order dated February 4, 2019

Dear Mr. Gustafson:

JNE Consulting and Engineering ("JNE") submits this Compliance Plan (the "Plan") on behalf of Erie Coke Corporation ("ECC") in accordance with Paragraph 3 of the Pennsylvania Department of Environmental Protection February 4, 2019 Administrative Order (the "Order").

As the Department knows, ECC has filed appealed the Order to the Pennsylvania Environmental Hearing Board. Accordingly, neither the submission of this Compliance Plan, nor its contents, are an admission or concession that ECC violated any legal requirements or that the Order was lawfully issued, and ECC reserves its rights to contest any and all such matters in any applicable forum. Nor should this Compliance Plan be construed as an admission that any of the Department's findings are accurate or supported by evidence.

Further, ECC's evaluation of these matters is also ongoing, and as needed or warranted, ECC may supplement or clarify this Compliance Plan.

Under Paragraph 3, the Department has directed ECC to prepare and submit a "plan and schedule" that will address four specific subjects, and that further will correct the alleged "violations listed in Paragraphs LL through WW and YY through CCC" of the Order. This Compliance Plan is organized accordingly, addressing each such paragraph or subparagraph in turn.

<u>Paragraph 3.a:</u> Provide a "report determining the cause of the continuing opacity emissions from the Battery stack, and a list of corrective actions to prevent further such exceedances ('Opacity Report') . . . prepared by a person with training and experience in the proper design and proper operation of coke oven batteries," including "a listing of that person's relevant training and experience.

The "Battery Stack Opacity Compliance Plan" required by Paragraph 3.a is attached as Exhibit A. The report determines and describes identified root and potential contributing causes of potential battery stack opacity issues and includes a list and schedule of actions to address such issues. As set forth in the Opacity Report, it was prepared with and by persons with training and experience in the design and proper operation of coke oven batteries, and it includes listings of those persons' relevant qualifications.

<u>Paragraph 3.b:</u> Provide an "engineering evaluation of the Coke Side Shed Baghouse's ability to capture and control coke pushing emissions from the Battery . .

. and a list of corrective actions to prevent future opacity emission exceedances in the future."

The "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" required by Paragraph 3.b is attached as Exhibit B. It evaluates the ability of the baghouse to capture and control coke pushing emissions in accordance with applicable legal requirements. It also includes a list of actions to further assure compliance with applicable opacity limitations, and a schedule for the implementation of the identified actions.

Paragraph 3.c: Provide an "administratively complete plan approval for the construction and installation of a backup control device to prevent the flaring or combustion of coke oven byproduct gas with hydrogen sulfide concentrations greater than 50 grains/100 dry standard cubic feet to utilize when the H_2S Absorber is out of service."

As ECC has has described at its March 5, 2019 meeting with the Department and otherwise, it was infeasible or impossible as a practical matter to conduct an engineering evaluation and treatment system design and then to also prepare an administratively-complete plan approval application within the 60-day timeline stated in the Order. As a result, ECC and the Department are considering entering a consent order and agreement to address this condition on a mutually agreed timetable, and ECC reserves its right to file a petition for supersedeas before the Environmental Hearing Board on any and all matters related to the Order, including without limitation Paragraph 3.c. However, the Company is hopeful that step can be avoided, and in the spirit of cooperation and transparency, ECC provides the following update on its efforts to address Paragraph 3.c since receiving the Order:

Promptly after receiving the Order, ECC began working diligently to execute on Paragraph 3.c. Specifically, ECC has been performing an engineering evaluation to develop one or more solutions that would then be the subject of a plan approval submission. As discussed during ECC's March 5, 2019 meeting with the Department, ECC anticipated that it would be able to complete that engineering evaluation within 60 days so that ECC could then prepare and submit a plan approval application.

As ECC's counsel has described to PaDEP's counsel, ECC has identified iron oxide boxes (also known as "iron sponge" technology) as a potentially viable back-up solution for hydrogen sulfide removal from the coke oven gas stream during outages of the existing absorber/thionizer system. This technology passes the coke oven gas stream through a bed of substrate material coated with iron oxide, and is a well-recognized and long-proven technology for the removal of hydrogen sulfide from gas streams. ECC has requested and is awaiting receipt of a proposal for an iron oxide box system.

ECC is also evaluating other technologies, primarily because the potential size of the iron oxide box or boxes entails a potential pressure drop management challenge and requires a large footprint area for installation. Consequently, ECC has investigated other candidate technologies and has identified at least ten additional alternatives to consider. Some examples include the Girbotol process, phosphate-shell process, Thylox process, a caustic soda process, a lime process, a Seabord/Stretford type (or Takahax type process) to a Claus Plant, and a Perox process similar to the system currently in use at ECC. With this suite of options identified, we are in the process of completing a comparative feasibility study with ECC.

Following selection of one or more treatment technologies, ECC will prepare and submit an administratively complete plan approval. Even if ECC had not needed to perform the above-described engineering evaluation to determine what solution or set of solutions it would submit in the plan approval, preparing and submitting that plan approval by the stated deadline of April 5 would likely have been infeasible in itself. Such plan approvals routinely require longer than 60 days to draft, review, refine, and submit. The need to perform an engineering evaluation, to identify the most effective and efficient treatment technology, ensured that the April 5 deadline was infeasible.

While the work described above is ongoing, ECC intends to maximize the extent to which its operation of its current absorber/thionizer system achieves compliance with the company's Title V permit. As PaDEP knows, there currently is not a back-up solution in place for the absorber/thionizer system, and the system will inevitably be off-line occasionally, whether for short regular maintenance or, if regular maintenance is not done, longer unscheduled forced outages.

Performing the routine maintenance is compliant with ECC's obligations under its Title V permit to implement "good operating practices," and to operate and maintain the absorber in accordance with "good air pollution control practices." *See* Permit Section B, Condition #008(b); Section D, Source ID 805, Condition #011; *see also* Section D, Source ID 805, Condition #013(b). With regular maintenance, ECC has been able to achieve total absorber/thionizer up-time of approximately 98%, and is working toward achieving 99% by improving the maintenance program and by considering various operating changes that will approach 99% up-time. Without such regular maintenance, ECC anticipates that the work needed to restore absorber/thionizer operation after a breakdown will result in two to ten times as much downtime.

Thus, we have concluded that, at least until a back-up solution is in place, routinely maintaining the absorber/thionizer system will maximize the extent to which ECC is compliant with applicable requirements, and ECC plans to proceed accordingly, subject to Department comment.

<u>Paragraph 3.d:</u> Provide an "updated work practice plan and operation and maintenance plan for the Facility."

The updated Facility "Work Practice Plan" and updated "Operation and Maintenance Plan," as required by Paragraph 3.d, are attached as Exhibit C. Subsequent to the revised Plans attached, ECC is continuing to further revise and update as we merge the new Work Plans and procedures into day to day operations. We anticipate further such revisions to manifest themselves and updates will continue, seeking full compliance with regulations.

<u>Paragraph 3 incorporating Paragraph LL:</u> Provide "a plan and schedule to correct" the alleged "failure to prevent topside emissions from more than 5% of the offtake piping on operating coke ovens."

The Work Practice Plan, Section 6 addressing, among other items, the matters alleged in Paragraph LL is attached as Exhibit C. This plan includes a list and schedule of actions to address the issues identified.

<u>Paragraph 3 incorporating Paragraph MM:</u> Provide "a plan and schedule to correct" the alleged "failure to prevent visible topside emissions from more than 2% of the charging port seals on operating coke ovens."

The Work Practice Plan, Section 5 addressing, among other items, the matters alleged in Paragraph MM is attached as Exhibit C. This plan includes a list and schedule of actions to address the issues identified.

Paragraph 3 incorporating Paragraph NN: Provide "a plan and schedule to correct" the alleged "failure to prevent visible door emissions from more than 10% of the door area of operating coke ovens."

The Work Practice Plan, Section 3 addressing, among other items, the matters alleged in Paragraph NN is attached as Exhibit C. This plan includes a list and schedule of actions to address the issues identified.

Paragraph 3 incorporating Paragraph OO: Provide "a plan and schedule to correct" the alleged "failure to operate the H_2S Absorber at all times."

A plan to address the matters alleged in Paragraph OO will be included as part of the May 5, 2019 submission pursuant to Paragraph 3.c of the Order.

Paragraph 3 incorporating Paragraph PP: Provide "a plan and schedule to correct" the alleged "failure to prevent the flaring or combustion of coke oven by-product gas with hydrogen sulfide concentrations greater than 50 grains/100 dry standard cubic feet."

A plan to address the matters alleged in Paragraph OO will be included as part of the May 5, 2019 submission pursuant to Paragraph 3.c of the Order.

Paragraph 3 incorporating Paragraph QQ: Provide "a plan and schedule to correct" the alleged "failure to prevent visible open charging emission of greater than 75 seconds for four consecutive charges."

The Work Practice Plan, Section 4 addressing, among other items, the matters alleged in Paragraph QQ is attached as Exhibit C.

Paragraph 3 incorporating Paragraph RR: Provide "a plan and schedule to correct" the alleged "failure to prevent the visible emissions from the Battery stack exceeding 20% [opacity] for periods aggregating more than three minutes in an hour."

The "Battery Stack Opacity Compliance Plan" attached as Exhibit A addresses the matters alleged in Paragraph RR.

Paragraph 3 incorporating Paragraph SS: Provide "a plan and schedule to correct" the alleged "failure to prevent visible emissions from the Battery stack exceeding 60% [opacity] at all times."

The "Battery Stack Opacity Compliance Plan" attached as Exhibit A addresses the matters alleged in Paragraph SS.

Paragraph 3 incorporating Paragraph TT: Provide "a plan and schedule to correct" the alleged "failure to prevent fugitive particulate emissions that are visible outside the Facility's property."

Based upon Exhibit B to the Order, ECC understands this allegation to relate specifically to the presence of visible pushing emissions beyond the ECC property line. Based upon that understanding, the "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" attached as Exhibit B addresses the matters alleged in Paragraph TT.

Paragraph 3 incorporating Paragraph UU: Provide "a plan and schedule to correct" the alleged "failure to prevent visible fugitive air contaminants in excess of 20% opacity from the Battery during coke pushing operations."

The "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" attached as Exhibit B addresses the matters alleged in Paragraph UU.

Paragraph 3 incorporating Paragraph VV: Provide "a plan and schedule to correct" the alleged "failure to record the annual adjustment or tune-up of the combustion process."

The Work Practice Plan, Section 9 attached in Exhibit C describes relevant recordkeeping requirements, as discussed in Paragraph VV, and the work practices intended to ensure compliance. This recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019.

Paragraph 3 incorporating Paragraph WW: Provide "a plan and schedule to correct" the alleged "failure to maintain on site of the 12-month rolling totals of NOx emissions from the boilers."

The Work Practice Plan attached as Exhibit C describes relevant recordkeeping requirements, as discussed in Paragraph WW, and the work practices intended to ensure compliance. This recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019

Paragraph 3 incorporating Paragraph YY: Provide "a plan and schedule to correct" the alleged "failure to maintain the daily average fan RPM at or above the minimum level established during the initial or subsequent performance test."

The "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" attached as Exhibit B addresses the matters alleged in Paragraph YY. By way of further response, for the operational and compliance assurance reasons discussed in the "Coke Side Shed Capture Engineering Evaluation and Compliance Plan," ECC on a going forward basis elects to use fan motor amperes rather than revolutions per minute to demonstrate compliance with Permit Section E, Source 7, Term 15(d)(2), as permitted by the terms of that permit provision, 40 C.F.R. § 63.7333(d)(2), and 40 C.F.R. § 63.7290(b)(3)(i). The Operation and Maintenance Plan attached in Exhibit D incorporates this election and describes the associated recordkeeping requirements and the work practices intended to ensure compliance. This recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019.

Paragraph 3 incorporating Paragraph ZZ: Provide "a plan and schedule to correct" the alleged "failure to record fan RPM at least every eight hours."

The "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" attached as Exhibit B addresses the matters alleged in Paragraph ZZ. By way of further response, for the operational and compliance assurance reasons discussed in the "Coke Side Shed Capture

Engineering Evaluation and Corrective Action Plan," ECC on a going forward basis elects to use fan motor amperes rather than revolutions per minute to demonstrate compliance with Permit Section E, Source 7, Term 15(d)(2), as permitted by the terms of that permit provision, 40 C.F.R. § 63.7333(d)(2), and 40 C.F.R. § 63.7290(b)(3)(i). The Operation and Maintenance Plan attached as Exhibit D incorporates this election and describes the associated recordkeeping requirements and the work practices intended to ensure compliance. This recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019.

Paragraph 3 incorporating Paragraph AAA: Provide "a plan and schedule to correct" the alleged "failure to maintain records required in 40 C.F.R. § 63.7333 to show continuous compliance with each applicable emission limitation, work practice standard, and operation and maintenance requirement."

The "Coke Side Shed Capture Engineering Evaluation and Compliance Plan" attached as Exhibit B addresses the matters alleged in Paragraph AAA. The Work Practice Plan, Section 9 attached as Exhibit C incorporates this election and describes the associated recordkeeping requirements and the work practices intended to ensure compliance. This recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019

Paragraph 3 incorporating Paragraph BBB: Provide "a plan and schedule to correct" the alleged "failure to conduct daily washing of the [quench tower] baffles according to the Facility's operation and maintenance plan, and to continuously record the ambient temperature on the days the baffles were not washed."

The Work Practice Plan and Operations and Maintenance Plan attached as Exhibit C describes the necessary work practices and associated recordkeeping requirements, as alleged in Paragraph BBB. These work practices and recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019

Paragraph 3 incorporating Paragraph CCC: Provide "a plan and schedule to correct" the alleged "failure to take reasonable action to prevent particulate matter from becoming airborne, including, but not limited to, promptly removing earth or other material from paved streets onto which earth or other material was transported by trucking or other means."

The Operations and Maintenance Plan attached as Exhibit C describes the necessary work practices, as alleged in Paragraph CCC. These work practices and recordkeeping requirement will be the subject of refresher training for relevant personnel within the second quarter of 2019

* * *

Should the Department have any questions concerning the foregoing, it should not hesitate to contact Erie Coke's Engineering Manager Charles V. Lauricella at (716) 864-1556 or Erie Coke's Environmental Director Edward R. Nesselbeck at (716) 866-4675.

Very truly yours,

Scott M .Thurston, PE

Exhibit A

ERIE COKE CORPORATION
ERIE, PA
BATTERY STACK OPACITY COMPLIANCE PLAN
PREPARED APRIL 2019

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INTRODUCTION

Erie Coke Corporation ("ECC") has prepared this *Battery Stack Opacity Compliance Plan* (the "Opacity Plan") in response to a Pennsylvania Department of Environmental Protection Administrative Order dated February 4, 2019.

Two types of battery stack opacity have been identified: "base opacity", which is the more consistent type, and "spike opacity", which presents itself as acute in nature. These two types of opacity have different causal structures as summarized below.

Minor variations in the magnitude of base opacity can be impacted by 5 primary factors:
1) coke oven gas ("COG") fuel quality
2) fuel gas riser or gas gun leakage into regenerators under the battery floor
3) flooding end flues (flues 1 to 3 in from both pusher side and coke side)
4) relatively typical oven wall permeability
5) slightly rich combustion in the oven wall flues

Spike opacity is caused by occurrences of very rich local combustion which can be impacted by 3 primary factors:
1) acute very low combustion-air conditions
2) high volume wall leakage into oven-wall flues from within an oven
3) high velocity wall leakage into oven-wall flues from within an oven

All 8 of these primary factors were traced to evaluate each of their individual roots and their potential causes. A corrective action plan was prepared to address the factors and/or subfactors that will be most effective in reducing stack opacity and in achieving more consistent regulatory compliance as soon as possible.

See the attached *Battery Stack Opacity Potential Cause Diagram* for a comprehensive summary of all potential causes and their potential roots. The following pages summarize all of these roots and suggest 47 Action Items ("AIs") that can be used to address each of them even if they were not found to be presently contributing significantly to stack opacity violations. Each of the 47 AIs and the action recommended to address each item are presented in the attached *Battery Stack Opacity Compliance Plan Table*. A prioritized list of the most significant stack opacity contributors is summarized in the conclusion.

SECTION 1

1. **Reduce Baseline Opacity.**
    a. Maintain COG Fuel Quality:
        i. Conduct regular maintenance on the Absorber/Thionizer gas conditioning system to optimize its function. **See AI 1**. This will also help avoid adverse impacts to the collecting-main back-pressure control system and improve fuel gas quality as well.
    b. Address Any Fuel Gas Riser or Gun Leakage Into Regenerators:
        i. Inspect all non-burning flues at least once per month to identify those that are burning or drafting gas during the off reverse. **See AI 2**.
    c. Find and Correct Flooding End Flues
        i. Inspect end-flues quarterly and conduct heating work as described in the **Work Practice Plan** ("WPP") to eliminate cold end flues. Modify the **WPP** if necessary to address this issue. **See AI 3**.
    d. Reduce Any Increased Wall Permeability:
        i. Build and Maintain Wall Carbon. See **Attachment 1**.
    e. Prevent Rich Combustion:
        i. Minimize flooding flues. See **Attachment 2**.
        ii. Correct low combustion air flow. See **Attachment 3**.
        iii. Reduce high COG fuel Flow. See **Attachment 4**.
        iv. Minimize COG fuel flow variability. See **Attachment 5**.
        v. Avoid Conditions that Require Natural Gas Fuel Supplementation to Battery Under-fire Combustion. See **Attachment 6**.

SECTION 2

2. **Reduce Spike Opacity by Preventing Very Rich Combustion Events.**
    a. Address Potential Very Low Combustion-Air Flow Causes – This Only Occurs When the Stack Draft Damper is Wide Open and is Still Unable to Maintain the Draft Set-Point. See **AI 26**.
        i. Maintain waste heat temperature above minimum required for given operating conditions. Stack draft is positively correlated with both waste-heat gas and stack temperature. See **AI 19**.
        ii. Inspect stack draft damper system quarterly and conduct maintenance as required. See **AI 20**.
        iii. Continue to monitor waste-heat tunnel draft as compared to the draft set-point. Conduct pressure-drop investigations of the tunnels and their breachings to identify and locate other sources of blockages when a waste-heat temperature problem is ruled out and when the stack-draft damper system is operating properly. See **AI 21**.
    b. Identify and Address High Volume Wall Leakage:
        i. Minimize holes in walls. **See Attachment 7**.
    c. Identify and Correct High Velocity Wall Leakage:
        i. Minimize cracks in walls. **See Attachment 8**.
        ii. Prevent excessively low flue-pressure conditions. **See Attachment 9**.
        iii. Prevent excessively high oven-pressure conditions. **See Attachment 10**.

ATTACHMENT 1

1. **Build and Maintain Wall Carbon.**
    a. Do Not Leave Oven Doors Off Any Longer Than Necessary During Either Production Operations or Oven Maintenance Activities, See **AI 4**. Insulate “Paper-Up” the Door Opening of Ovens That Are Out-of-Line For Maintenance or Repair. See **AI 5**.
    b. Prevent Excessively Low Collecting-Main Back-Pressure. Excessively Low Back-Pressure Can Lead to Low Oven Pressures Which Promotes the Back-Flow of Flue Gas from Wall Flues Back Into Ovens During Reverses Which Burns Off Wall Carbon.
        i. Do not set back-pressure set-point too low for present operating conditions. See **AI 6**.
        ii. Address excessive fluctuations in the back-pressure control system. See **Attachment 11**.

ATTACHMENT 2

1. **Minimize Flooding Flues.**
    a. Prevent Combustion Air Short-Circuiting:
        i. Annually inspect the regenerators below the walls where evidence exists of flooding flues for indications of short-circuiting. Prepare and execute location specific remedies if found. See **AI 14**.
    b. Identify Plugged Air-Ports:
        i. Inspect, identify and correct plugged air-ports, See **AI 15**. Update **WPP** if necessary to address this issue.

ATTACHMENT 3

1. **Correct Low Combustion Air Flow.**
    a. Be Aware of Stack Draft Dysfunction :
        i. Changing weather conditions causing ambient temperature fluctuations change the density of air from season to season. This will change the amount of combustion air being drafted into the battery through the air inlets or air boxes feeding each wall. This may require finger bar adjustments between seasons depending on production and fire rates. See **AI-16**.
    b. Reduce the Number of Finger-Bars so as Not to Restrict air Flow at Times When Combustion Air Flow is Low (this will tend to raise flue pressures on the battery), See **AI 17**, Alternatively or in Conjunction:
    c. Increase Waste-Heat Stack Draft to Pull More Air Through the same Finger-Bar Settings. This alternative will tend to cause a lower flue pressure for the same air flow compared to removing finger-bars. See **AI 18**. The following conditions can contribute to low waste-heat stack draft:
        i. Maintain waste heat temperature above minimum required for given operating conditions. See **AI 19**. Stack draft is a function of stack temperature. Lower waste-heat temperature will create less natural draft and impact combustion air flow if draft-damper is out of its control range.
        ii. Inspect stack draft damper system quarterly and conduct maintenance as required. See **AI 20**.
        iii. Continue to monitor waste-heat tunnel draft as compared to the draft set-point. See **AI 21**. Conduct pressure-drop investigations of the tunnels and their breachings to identify and locate other sources of blockages if a waste-heat temperature problem is ruled out and when the stack-draft damper system is operating properly. See **AI 22**.

ATTACHMENT 4

1. **Avoid Excessively High Coke-Oven-Gas Fuel Flow.**
    a. Prevent Fluctuating Coke-Oven-Gas Plant Pressure: Fluctuating gas pressure has the potential to cause battery manifold or battery-gas-main pressure fluctuations leading to coke-oven-gas fuel pressure fluctuations which can cause intermittent high fuel gas flows. The following actions will reduce the incidence of all these fluctuations:
        i. Reduce incidence of primary cooler blockages by monitoring pressure drop across the Primary Cooler and by hot flushing the Primary Cooler when necessary. See **AI 9**.
        ii. Reduce coke-oven-gas main blockages by monitoring plant gas pressure distributions and drops to identify and address suspect sections of piping or vessels before they become debilitating. See **AI 10**.
        iii. Monitor operating Exhauster and suction system control function. Conduct preventative maintenance on 1) Exhausters to assure proper lubrication, and 2) on the Exhauster VFDs to identify cooling fan failure or fan filter plugging. See **AI 11, 12 and 13**.
        iv. Reduce incidence of gas Absorber blockages by monitoring pressure drop across the Absorber and by hot flushing the Absorber/Thionizer system as maintenance. See **AI 1**. This has been observed to require attention approximately every other month or about 7 times per year on average.

ATTACHMENT 5

1. **Minimize Coke-Oven-Gas Fuel Flow Variability.**
    a. Replace damaged or missing gas nozzles. See **AI 23**. Update the **WPP** with details and schedules of recommended gas nozzle work if necessary.
    b. Prevent inconsistent placement of gas orifices (on A Battery) or pins (on B Battery) that could cause coke-oven-gas fuel flow variability. Take battery cross-wall temperatures to identify this situation. See **AI 24**.

ATTACHMENT 6

1. **Avoid Conditions that Require Natural Gas Fuel Supplementation to Battery Under-fire Combustion.**
    a. Conduct Quarterly Inspections and Conduct Preventative Maintenance on Battery Machines (Pusher Machine, Back-Door Machine, Larry (Charge) Car, Quench Car). See **AI 25**. Production outages caused by machine malfunctions can create low coke-oven-gas production requiring supplemental natural gas to the battery under-fire combustion.

ATTACHMENT 7

1. **Minimize Holes in Walls.** If a High Opacity Spike is Observed During Charging, Conduct Battery Topside Diagnostics Using Steam Aspiration to Identify the Suspect Oven and Flue Inspections to Specify both the Wall and the Specific Oven Flues Impacted, see **AI 27**. Otherwise, to Reduce the Frequency of Such Events, Continue Visually Inspecting Wall Ends for Holes During End Spraying Before Charging. See **AI 28**.
    a. Prevent Mechanical Wall Damage by Physical Contact from Pusher Ram or Leveling-Bar.
        i. Inspect the Pusher Machine ram and leveling-bar motion monthly (see **AI 29**) and the Pusher Rail condition annually to identify conditions which may contribute to mechanical wall damage. See **AI 30**.
        ii. Reduce the incidence of hard pushes and/or stickers. See **Attachment 12**.
    b. Minimize Thermal Shock on Wall Refractory Ends.
        i. Thermal shock on wall ends is unavoidable but should be minimized by putting doors on as quickly as possible, see **AI 4**. Do not leave oven doors off any longer than necessary during either production operations or oven maintenance activities. Insulate “paper-up” the door opening of ovens that are out-of-line for maintenance or repair. See **AI 5**.
    c. Minimize Cracks in Walls. See **Attachment 8**.

ATTACHMENT 8

1. **Minimize Cracks in Walls.** If a High Opacity Spike is Observed During Charging, Conduct Battery Topside Diagnostics Using Steam Aspiration to Identify the Suspect Oven and Flue Inspections to Specify both the Wall and the Specific Oven Flues Impacted, see **AI 27**. Otherwise, to Reduce the Frequency of Such Events, Continue Visually Inspecting Wall Ends for Cracks During End Spraying Before Charging. See **AI 28**.
    a. Prevent Mechanical Wall Damage by Physical Contact from Pusher Ram or Leveling-Bar.
        i. Inspect the Pusher Machine ram and leveling-bar motion monthly (see **AI 29**) and the Pusher Rail condition annually to identify conditions which may contribute to mechanical wall damage. See **AI 30**.
        ii. Reduce the incidence of hard pushes and/or stickers. See **Attachment 12**.
    b. Minimize Thermal Shock on Wall Refractory Ends and Charging-Hole Refractory.
        i. Thermal shock on wall ends and near charging-holes is unavoidable but should be minimized by putting doors and lids on as quickly as possible. Do not leave oven doors or lids off any longer than necessary during either charging, operations or oven maintenance activities, see **AI 4**. Insulate “paper-up” the door opening of ovens that are out-of-line for maintenance or repair. See **AI 5**.
    c. Prevent Loose Tie-In Joints During End-Flue Repairs.
        i. Tie-in joints between old and new refractory on walls with end flue repairs are a source of openings equivalent to wall cracks. This joint requires special attention during the end-flue job and may require ceramic welding if the joint opens up after the repair is complete. See **AI 34**.

ATTACHMENT 9

1. **Prevent Excessively Low Flue-Pressure Conditions.** Measure Wall Flue-Pressures Annually (see **AI 35**) and:
    a. Follow Up With an Inspection of the Quadrant Valves on Any Walls With Lower Than Average Flue-Pressures to Be Certain That They Are Not Open Too Far. See **AI 36**.
    b. Follow Up with an Evaluation of the Overall Battery Stack-Draft Setting or the Overall Battery Finger Bar Settings if the Flue-Pressure is too Low.
        i. If the flue-pressures are too low, either decrease the stack-draft setting or take finger bars off as needed to help correct the low flue-pressure condition. See **AI 37 and 38**.
    c. Follow up With an Inspection of Mushroom Valves to Be Certain That They Are Operating Properly and Not Stuck Open or Closed During Their Respective Reverses. See **AI 39 and 40**.

ATTACHMENT 10

1. **Prevent Excessively High Oven-Pressure Conditions.**
    a. Prevent Excessively Hot Walls and Wide Oven Temperature Variations. Charging coal into an overheated oven or into an oven with some wall hot-spots can produce a rush of gas that creates a temporary high oven pressure condition.
        i. Make the correct heating parameter adjustments for the present coke production rate and make gradual heating adjustments for production rate changes. See **AI 41 and 42**.
        ii. Maximize the number of ovens in line; minimize the quantity of stickers (stuck ovens). When fewer ovens are in line at any given time, a greater coking temperature (and a lower the coking-time) is required to achieve a given production rate. Each sticker must be individually examined and studied to find the unique reason it is not pushing, see **AI 43**. See **Attachment 12** for further information on hard pushing and/or stickers.
    b. Minimize Oven Standpipe Damper Obstructions Where they are Either Partly or Wholly Closed.
        i. Follow proper operating procedures to ensure that an oven's standpipe damper is not left wholly or partly closed during the charging or coking process. Update the **WPP** and training if necessary, to highlight the importance of this. See **AI 44**.
        ii. To prevent Corliss Damper Valve malfunction, conduct routine monthly steaming to and preventative maintenance of the valves and damper handles. See **AI 45**.
        iii. Clean out standpipes and/or goosenecks with the gooseneck tool and/or chipping guns monthly to keep open passageways in each oven offtake. See **AI 46**.
        iv. Steam out the collecting-main and chase tar at least twice per year to prevent tar blockages that adversely impact the offtake of gas from the ovens. See **AI 7**.
    c. Prevent Excessively High Collecting-Main Back-Pressure for Present Operating Conditions.
        i. Steam out the collecting-main and chase tar at least twice per year to prevent tar blockages that adversely impact collecting-main back-pressure. See **AI 7**.
        ii. Ensure that the collecting-main back-pressure set-point is not too high for the given operating conditions and especially that it is balanced with a correspondingly adequate flue-pressure. See **AI 47**.
        iii. Monitor operating Exhauster and Suction System Control function. Conduct preventative maintenance on Exhausters to assure proper lubrication and on the Exhauster VFDs to identify cooling fan failure or fan filter plugging. See **AI 11, 12 and 13**.
        iv. Address excessive fluctuations in the back-pressure control system. See **Attachment 11**.

ATTACHMENT 11

1. **Address Excessive Fluctuations in the Back-Pressure Control System.**
    a. "Chase Tar" (Clean out Collecting-Main and Suction-Main Crossovers) Twice per Year to Prevent Tar Blockages. See **AI 7**.
    b. Inspect and Tune Back-Pressure Control System Quarterly to Prevent Hunting or Slow Response. See **AI 8**.
    c. Prevent Excessive Suction Fluctuations in Battery Suction-Main:
        i. Reduce incidence of Primary Cooler blockages by monitoring pressure drop across the Primary Cooler and hot flushing the Primary Cooler when necessary. See **AI 9**.
        ii. Reduce coke-oven-gas main blockages by monitoring plant gas pressure distributions and drops to identify and address suspect sections of piping or vessels before they become debilitating. See **AI 10**.
        iii. Monitor operating Exhauster and suction system control function. Conduct preventative maintenance on Exhausters to assure proper lubrication and on the Exhauster VFDs to identify cooling fan failure or fan filter plugging. See **AI 11, 12 and 13**.
        iv. Reduce incidence of gas Absorber blockages by monitoring pressure drop across the Absorber and hot flushing the Absorber/Thionizer system as preventative maintenance. See **AI 1**.

ATTACHMENT 12

1. **Reduce the Incidence of Hard Pushes and/or Stickers.**
    a. Maintain Consistent Pushing Cycles.
        i. Schedule ovens in a consistently spaced pushing pattern with a coking-time that corresponds to the present battery temperature. Stick to the schedule as much as possible. See **AI 31**.
    b. Coal Blend Characteristics.
        i. Continue to produce, mix and pulverize a coal blend that shrinks at the end of the coking cycle to help facilitate easier pushing. See **AI 32**.
    c. Inspect the Inside Surface of Walls and Floors of Ovens with Higher than Average Pushing Current (amps).
        i. Higher Amp pushing ovens, or historically harder pushing ovens, require smoother than average inside surfaces to help facilitate easier pushing. Especially check the tie-in joint on oven walls that have previously had end flue repairs and smooth that joint if necessary, to reduce wall friction. See **AI 33**.

CONCLUSION AND COMPLIANCE PLAN

47 Action Items ("AIs") were identified and prioritized. The following 10 (21.3% of them) were identified as priorities:

1. Conduct regular maintenance and cleaning on Absorber/Thionizer System (**AI 1**)
    a. Next regular cleaning date will occur later this spring unless and until PADEP instructs otherwise.
2. Chase tar twice per year (**AI 7**)
    a. Next Projected Completion date: July 30, 2019
3. Correct Plugged or blocked air-ports at a rate of 20 walls per month (**AI 15**)
    a. Projected Completion date: July 30, 2019
4. Replace missing gas nozzles at a rate of 20 walls per month (**AI 23**)
    a. Projected Completion date: July 30, 2019
5. Conduct cross-walls and make custom gas adjustments at 20 walls per month (**AI 24**)
    a. Projected Completion Date: July 30, 2019
6. Correct wall and floor imperfections on hard pushers twice per year (**AI 33**)
    a. Projected Completion Date: December 20, 2019
7. Ceramic weld tie-in joints and other cracks twice per year (**AI 34**)
    a. Projected Completion Date: December 20, 2019
8. Reduce the number of stickers down to less than 5 ovens at 1 oven per month (**AI 43**)
    a. Projected Completion Date January 1, 2020
9. Steam all Corliss valves and adjust damper handles at 20 ovens per month (**AI 45**)
    a. Projected Completion Date: July 30, 2019
10. Clean all standpipes and goosenecks at 20 ovens per month (**AI 46**)
    a. Projected Completion Date: July 30, 2019

The identified causes that these 10 action items address are designated on the *Battery Stack Opacity Potential Cause Diagram* by a bold box outline.

33 of the 47 AIs identified (70.2%) are of lower priority and are directly related to operations practices. These 33 items need to be evaluated as a source for future modifications of the **Work Practice Plan** ("WPP") and incorporated into the future training of operators. The WPP and training schedules will be modified to enhance these issues by August 15, 2019.

4 of the 47 AIs identified (8.5%) are systemic actions that should be conducted annually: Inspecting regenerators (AI 14), inspecting pusher rails (AI 30), and measuring wall flue pressures and adjusting quadrant valves (AI 36 and 37). These inspections and adjustments will be made by December 20, 2019.

As can be seen above, most of this work will be completed during the summer of 2019 and all of it will be completed before the end of 2019. It is estimated that the completion of this work will have a very positive impact on compliance status of the facility.

BATTERY STACK OPACITY COMPLIANCE PLAN TABLE

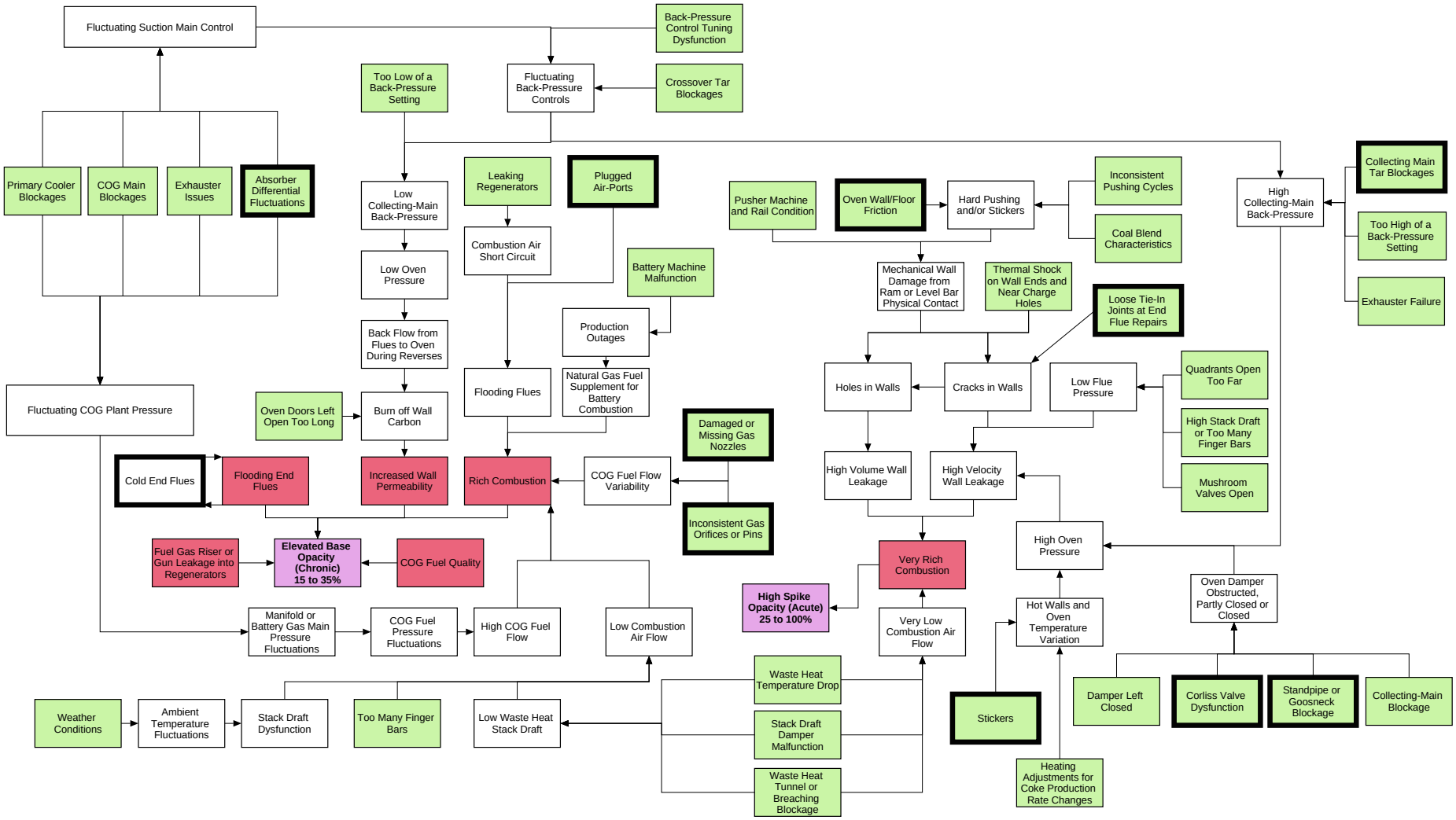
ERIE COKE CORPORATION

AI	Inspections, Evaluations, Engineering Studies	Frequency	Starting	Actions	Completion Date
1	**REDUCE BASELINE OPACITY**				
1a	**Maintain COG Fuel Quality**				
1	Monitor pressure drop across the Absorber and hot flush as maintenance	Six to Seven Times per Year	N/A	Conduct regular maintenance and cleaning	Ongoing
1b	**Address Fuel Gas Riser or Gun Leakage Into Regenerators**				
2	Inspect all non-burning flues for those burning during their off reverse	Each Flue at Least Once Per Quarter	Jun-19	Heater's Job, Revise WWP, Training	August 15, 2019
1c	**Correct Flooding End Flues**				
3	Inspect end flues and conduct flue repair work as required (Heater's Job)	Quarterly	May-19	Update WPP if necessary, Training	August 15, 2019
1d	**Decrease Wall Permeability - Wall Maintain Carbon**				
4	Do not leave oven doors off any longer than necessary	Continuous	N/A	Battery Operators Job, Training	August 15, 2019
5	Insulate "paper-up" door openings of ovens out of line for maintenance work	Continuous	N/A	Battery Operators Job, Training	August 15, 2019
6	Monitor collecting-main back-pressure, do not set too low for present conditions	Continuous	N/A	Heater's Job, Revise WWP, Training	August 15, 2019
7	Clean out collecting-main and battery crossovers, "Chase Tar"	Twice Per Year	Jul-19	"Chase Tar"	July 30, 2019
8	Inspect back-pressure control system and tune as required	Quarterly	May-19	Instrumentation tuning	Ongoing
9	Monitor pressure drop across the primary cooler and hot flush when necessary	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
10	Monitor plant gas pressure distributions and drops and steam when necessary	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
11	Monitor COG Exhauster and battery suction system control	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
12	Lubricate COG Exhauster	See Lubrication Schedule	N/A	Lubricator's Job	Ongoing
13	Inspect COG Exhauster VFD fan and fan filter	Monthly	Apr-19	BP Operator's Job, Training	August 15, 2019
1e	**Prevent Rich Combustion**				
14	Inspect and evaluate battery wall regenerators	Annually	Oct-19	Execute wall specific remedies	December 20, 2019
15	Inpect, identify and correct plugged or blocked air-ports	20 walls per month	May-19	Correct all air-ports	July 30, 2019
16	Be aware of ambient temperature fluctuations and their impact on stack draft	Daily	Apr-19	Update WPP if necessary, Training	August 15, 2019
17	Evaluate finger bar settings and make adjustments for operating conditions	Quarterly	May-19	Heater's Job, Revise WWP, Training	August 15, 2019
18	Evaluate stack draft setting balance	Quarterly	May-19	Heater's Job, Revise WWP, Training	August 15, 2019
19	Monitor waste heat temperature to maintain minimum	Continuous	N/A	Update WPP if necessary, Training	August 15, 2019
20	Inspect draft damper system	Quarterly	Jun-19	Update WPP if necessary, Training	August 15, 2019
21	Monitor waste heat draft verses set-point	Continuous	N/A	Heater's Job, Revise WWP, Training	August 15, 2019
22	Investigate pressure drop in tunnels/breachings if necessary to pinpoint blockages	When Draft is Below Set-Point	N/A	Heater's Job, Revise WWP, Training	August 15, 2019
23	Inpect, identify and replace missing nozzles	20 walls per month	May-19	Replace missing nozzles	July 30, 2019
24	Take crosswall temperatures to assure uniform wall gas distribution	20 walls per month	May-19	Adjust gas orifices or pins as needed	July 30, 2019
25	Conduct inspections on all battery machines to reduce outages	Quarterly	Jun-19	Update WPP if necessary, Training	August 15, 2019
2	**REDUCE HIGH SPIKE OPACITY BY VERY RICH COMBUSTION**				
2a	**Address Very Low Combustion-Air Flow**				
26	Check to be sure that draft damper is not wide open while in automatic	Daily	Apr-19	Update WPP if necessary, Training	August 15, 2019
2b	**Identify and Address High Volume Wall Leakage**				
27	Use battery topside diagnostics to identify opacity contributing walls	When Opacity Spike is Observed	N/A	Locate and repair hole at next push	Ongoing
28	Visually inspect wall ends after pushing (before charging) and during end-spraying	Every Push/Charge	Apr-19	Patch holes and/or cracks when located	Ongoing
29	Inspect Pusher Machine ram and leveling bar travel	Monthly	May-19	Identify ram and bar wall contact	Ongoing
30	Inspect Pusher rail elevation and condition	Anually	Nov-18	Pusher rails were already inspected	November 30, 2018
31	Maintain consistent pushing schedules and stick to schedule as much as possible	Continuous	N/A	New training and regular supervision	August 15, 2019
32	Mainatin a consistent coking coal blend that shrinks at the end of the coking cycle	Continuous	N/A	Corporate function	Ongoing
33	Study pushing amp data. Inpsect oven walls/floors with higher than ave amps	Twice Per Year	Jun-19	Correct wall/floor imperfections	December 20, 2019
2c	**Identify and Correct High Velocity Wall Leakage**				
34	Visually inspect wall ends where end flue repairs have been conducted	Twice Per Year	Jul-19	Ceramic weld tie-in joints and other cracks	December 20, 2019
35	Measure and inspect battery wall flue pressures	Annually	May-19	Determine if flue pressures are low	December 20, 2019
36	Measure waste heat box suctions and inspect quadrant valve positions on low ones	Annually	Nov-19	Make adjustments to quadrant valves	December 20, 2019
37	Evaluate overall stack draft setting to see if it is too high	When Flue Pressures are Low	May-19	Adjust stack draft set-point down	N/A
38	Evaluate overall finger bar settings to see if there are too many on	When Flue Pressures are Low	May-19	Take finger bars off	N/A

BATTERY STACK OPACITY COMPLIANCE PLAN TABLE

ERIE COKE CORPORATION

AI	Inspections, Evaluations, Engineering Studies	Frequency	Starting	Actions	Completion Date
39	Visually inspect mushroom valve linkage and chains	Daily	N/A	Heater's Job	Ongoing
40	Lubricate mushroom valve linkages	See Lubrication Schedule	N/A	Lubricator's Job	Ongoing
41	Hold the proper battery heat for the present production rate	At Whatever Production Rate	N/A	Hold proper battery temperature	Ongoing
42	Make only gradual heating adjustments	When Production Rate Changes	N/A	Make only gradual heating adjustments	Ongoing
43	Examine each stuck oven (stickers), then customize repairs to get them in-line	One oven per month	Jan-19	Reduce no. of stuck ovens to less than 5	January 1, 2020
44	Evaluate operating procedures on standpipe damper position	One Time	Jun-19	Update WPP if necessary, Training	August 15, 2019
45	Conduct routine steaming of Corliss valves and PM damper handles	20 Ovens Per Month	Apr-19	Steam all Corliss valves & fix handles	July 30, 2019
46	Clean out standpipes and/or goosnecks regularly	20 Ovens Per Month	Apr-19	Clean all standpipes & goosnecks	July 30, 2019
47	Ensure Training on balance between flue pressures and oven back-pressure	Quarterly	May-19	Update WPP if necessary, Training	August 15, 2019



ERIE COKE CORPORATION

BATTERY STACK OPACITY

POTENTIAL CAUSE DIAGRAM FOR Elevated Stack Opacity

April 4, 2019

Studied Effect

Primary Cause

Independent Cause

Side Effect

ERIE COKE CORPORATION
BOX 6180
ERIE, PENNSYLVANIA 16512 – 6180/(814) 454 – 0177

CHUCK LAURICELLA

clauricella@eriecoke.com

ENGINEERING MANAGER
(716) 864-1556

COKE PLANT MANAGEMENT AND LEADERSHIP

Engineer and manager for the past 22 years at **Bethlehem Steel Corporation** (BSC) in Lackawanna, NY; **Tonawanda Coke Corporation** (TCC) in Buffalo, NY and **Erie Coke Corporation** (ECC) in Erie, PA. Managed teams of consultants; professional engineers, tradesmen and contractors on capital projects and major environmental improvement projects. Have acquired detailed hands-on industrial coke plant experience by performing 4 months of intensive "looper" training as a foreman in each major department at BSC. Travelled to China for coke plant seminar.

COKE PLANT ENGINEERING AND INSTRUMENTATION

Supervised instrumentation and controls work at over the past 18 years including installation of an *Allen-Bradley* PLC data collection system at TCC, work on *Askania* hydraulic controls, *Hagen* pneumatic controls, *Honeywell* single-loop PID electronic controllers, *Beck* electric drives, *Fisher* automatic control valves, custom boiler master controls for dual-fuel combustion on a *York-Shipley* 20,000 pph steam boiler and retrofitted 1940's vintage 80,000 pph *CE* superheated boiler to modern automatic controls. Managed the installation and start-up of a 2.5 MW *Allis-Chalmers* extractive steam turbine electric power generator at TCC.

COKE PLANT CAPITAL PROJECTS

Supervised the design, installation and start-up of a new **coke oven gas** (COG) ammonia scrubber (LGA); a new **extractive**-type tar-injection **primary** gas **cooler** (EPC) system; and a new ammonia stripper (still) at TCC. Project manager for conversion of *York-Shipley* fire-tube boiler from natural gas to dual-fuel COG firing at TCC. Supervised the installation of a 2.5 MW extractive steam turbine electric generator and a 2.0 MW *Kohler* diesel back-up generator at TCC. Designed new laboratory with **thermo-gravimetric analysis** (TGA) instrumentation at BSC. Worked on the design of a manual to automatic wharf conversion and engineered an automated pusher data collection system at BSC.

COKE PLANT ENVIRONMENTAL WORK

Designed and managed the installation of two **pushing emission control** (PEC) shed/baghouse systems and two **continuous opacity monitoring systems** (COMS) battery stack opacity systems.

Implemented wastewater mercury, naphthalene, and cyanide reduction systems at TCC. Designed and managed installation of COG condensate drip collection tanks (with floats) and a new breaching with sample ports to the boiler chimney at TCC. Responsible for waste heat stack COMS operation and certification at BSC. Headed up the development and implementation of **leak detection and repair** (LDAR) testing in the by-products plant at TCC. Worked with consultants to improve the accuracy of annual emissions inventories at several coke plants.

FLAMMABLE GAS PURGING OPERATIONS

Designed, planned and implemented flammable gas purging operations using compressed inert-gas (nitrogen) and/or steam at several coke plants. Designed the safe shut-down plan for TCC and was the on-site shut-down coordinator during that successful shut-down.

RESEARCH AND DEVELOPMENT WORK

Conducted basic research on coke oven coal charge density and coal bulk density control using oil sprays at BSC, published on and won an award for the work. See published paper and the *AISE Kelly Award* listed below. Created a model to predict COG benzene concentration (given a known coal blend volatile matter and coking time). Conducted research on the design of a pilot-sized non-recovery coke oven made of fused silica modular brick and a 3,000 ton hydraulic press to compact coal. Did research on the thermal expansion and performance of industrial-scale fused silica modular brick in the coke ovens (verses lab-scale fused silica sample performance in the ceramic laboratories).

MAJOR REPAIR PROJECTS

Supervised the design and installation of a structural support system for a collapsing waste-heat-tunnel (at TCC) and the repair of major chimney degradation (at ECC), both with *International Chimney Corporation*. Restored to service a *Horton* gas sphere (60’ diameter) for COG storage and also researched the repeated mechanical failure of *Goulds* vertical boiler feed-water pump shafts at TCC.

COKE OVEN HEATING AND WALL REPAIR

Worked for 4 months (on turn) as a heater foreman and wrote the production schedules at BSC. As a process engineer at BSC, supervised installation of through-wall and end-flue rebuilds by *Modern Refractories*. Helped design and build the production facility at *Vanocur Refractories* in Tonawanda, NY that specializes in modular fused silica brick coke-oven-wall replacements. Developed heating system schematics to train heaters; designed oven repair maintenance logging system; and supervised refractory wall spray crew at BSC.

BY-PRODUCT PLANT WORK

Worked for 4 months (on turn) as a by-product foreman at BSC – this work included supervision of the ammonium sulfate salt system operations and the light-oil plant (including fractional distillation of individual solvents). Installed new 6,600 acfm EPC tar injection primary cooler system (for COG naphthalene control), new 15 gpm ammonia gas scrubber and a new 60 gpm ammonia distillation unit at TCC. Studied and made improvement recommendations for the Perox process COG hydrogen sulfide removal system at ECC. Supervised exhauster engineer,

cooler tender, ammonia still, crystallizer, mixer/settler and light-oil plant operations and developed operator's training schematics for a new naphthalene stripper system at BSC.

COKE PLANT COAL HANDLING

Worked for 4 months (on turn) as a coal handling foreman at BSC. Improved automatic coal bulk density control system both by improving the calibration method on a blender belt-scale and by using statistical process control (SPC) methods – also wrote the coal bulk density control ***Standard Operating Procedure*** *(SOP)*.

HAZARDOUS WASTE INDUSTRY and QUALITY CONTROL

10 years hands-on supervisory experience in hazardous waste industry including the identification, packaging, labeling, transporting, disposal and treatment of all types of hazardous wastes. Removed **polychlorinated biphenyl** (PCB) transformers and underground storage tanks. Packed lab chemicals for disposal for the *U.S. Army* at *Aberdeen Proving Grounds* in Maryland – the job required military security clearance and working with explosives, radioactives, smoke screens and nerve agents. Performed chemical-bulk-storage-tank inspections. Converted coal and coke QC reporting from hand-drawn trend-charts to computerized control charts using JMP SPC software and wrote COMS QA/QC plan at BSC. Former NYS Certified visible emissions observer.

FORMER AFFILIATIONS:

Association for Iron and Steel Technology (AIST) - Formerly called *AISE*
MESH committee of *American Coal & Coke Chemicals Institute* (*ACCCI*)
Board of Directors of *Eastern States Blast Furnace and Coke Oven Association (ESBFCOA)*

PUBLICATION:

A Model to Predict Coke-Oven Charge Densities, *AISE Steel Technology*, Jan. 2000, Vol. 77, No. 1, pg. 34-39. (Originally presented at AISE Conference in Cleveland, Sept. 1999)

AWARD:

AISE Kelly Award in 2000 with a $600.00 prize. The publication listed above was "judged to be of great merit and a significant contribution to the advancement of engineering and operating practice in the Iron and Steel Industry."

WORK HISTORY:

2018 – Present	ERIE COKE CORPORATION	Engineering Manager
2000 – 2018	TONAWANDA COKE CORPORATION	Engineering Manager
1997 – 2000	BETHLEHEM STEEL CORPORATION	Coke Oven Engineer
1993 – 1996	GREEN ENVIRONMENT SPEC.	Project Manager
1993 – 1993	OSEA	Waste Mgmt. Consultant
1987 – 1992	FRONTIER CHEMICAL WASTE	QC/Reg. Affairs Manager
1986 – 1987	CHEMICAL WASTE MANAGEMENT	Field Haz. Waste Chemist

1983 – 1984	NYS DEPARTMENT OF ENERGY	Student Energy Auditor

EDUCATION:

2002	St. Bonaventure Univ.	M.S. Professional Leadership
1987	University at Buffalo	B.S. Biophysical Sciences (Biophysics)
1984	Erie Community College	A.S. Engineering Science

SPECIAL TRAINING:

NYS DOE Energy Auditor Training in Albany, NY. DOL OSHA #501 Trainer Course (2001), QA/QC SPC, *UEC* coal and coke petrographic course, 40 hour Hazwoper Training, *McMaster University* (Canada) coke-making course, *Modicon* PLC's course, various pump training courses, Leadership training and W. E. Deming quality training at BSC.

Profile

Mr. Thurston has a rich career history as operations leader who recognized for outstanding job in guiding sophisticated manufacturing and business processes, delivering performance improvements, collaborating cross-functionally, partnering, and resolving complex problems/concerns. An accomplished leader with propensity for attaining results that strengthen competiveness and customer satisfaction who thrives on challenging opportunities, stimulating improved performance, and developing teams of high-performance contributors recognized for consistently exceeding established goals.

Project Experience

BNY Mellon
Vice President

Selected to lead continuous improvement projects for the Securities Data Management group. Evaluated the current workflows through one-on-one job observations focusing on high-risk manual processes as potential candidates for automation projects.

- **Data Visualization** – Created visualizations of errors and near misses, system volumes, vendor errors and delays, etc. to show high-risk areas by using Tableau to extract data from various databases.
- **Root Cause Analysis** – Conducted weekly root cause analysis meetings to focus on errors and near misses from the previous week and create action items to prevent reoccurrence of issues.
- **Metrics and Reporting** – Created automated dashboards to communicate daily metrics to senior management
- **Continuous Improvement** – Managed projects involving both the security master setup on the accounting system and project to automate manual tasks and client reporting using an Extract-Transform-Load (ETL) tool.

SNC-Lavalin America, Inc
Director, Operations

Promoted to restructure the two offices in the thermal power northeast region that provide engineering services to steel, chemical, and oil & gas clients.

- **Management Operating System –** Reviewed key metrics on a weekly basis and created action items to ensure strategic objectives were achieved.
- **Business Development –** Connected with potential strategic clients and presented company capabilities and services offered to assist clients achieve their goals. Visited existing clients to reinforce the company's commitment to help clients succeed. Continued to promote company brand in the US through targeted social media posts and conference sponsorships.
- **Operating Cost Reduction –** Right-sized the northeast offices to match the current and anticipated work backlog. Reduced SG&A costs to align with the new overhead structure for the northeast offices.
- **Office Relocation –** Reduced occupancy costs by 60% by relocating the Pittsburgh office to a new location that utilizes an open office environment and increases the space utilization to 85%. Selected the new office location to be in close proximity to existing and potential clients and business partners.
- **Implement Automated Workflow** – Implemented automated workflows for the Pittsburgh and Merrillville, IN offices that track early leads, leads, and proposals issued to clients.
- **Budget Management / Forecasting** – Established and tracked operating budgets including providing regular monthly and quarterly forecasts of performance compared to budget.

Mechanical / Process Section Head

Chosen to lead the Chemical / Process and Mechanical / Piping departments of the Pittsburgh office. Identified opportunities to increase efficiency and eliminating waste by implementing lean and six sigma techniques.

- **Metrics and Reporting –** Developed a dashboard showing performance against key metrics for the Pittsburgh office (% billable hours, non-billable hours, etc.) that aided in resource planning.
- **Corrective Actions –** Reduced the number of reported CADD issues by 50% through the collection of issues from project managers, engineers and designers; and assigned responsibility and target dates for solutions.
- **Standardized Tools and Training –** Reduced software costs by 40% by implementing the use of standard engineering software tools and increased training activities through a corporate wide purchasing agreement.

BNY Mellon
Vice President

Recruited to lead projects within the newly formed Continuous Process Improvement group.

- Diagnosed the current state of operations through various lenses (Clients, Process Efficiency & Automation, Organizational Skills, Mindsets & Behaviors, and Management Systems); designed solutions with appropriate business cases to transform the operation; and created implementation plans for the selected solutions.
- **Transfer Agency –** Evaluated the end-to-end transfer agency process to identity opportunities for process efficiency and automation (i.e. intelligent workflow systems & bar coding of incoming forms). Explored opportunities to leverage centers of excellence (reconciliations & lockbox) in the ideal future state design of the transfer agency. Developed a proof of concept for a transaction processing workflow application.
- **Mutual Fund Accounting –** Evaluated the entire mutual fund accounting process at Lake Mary, FL. The analysis focused on the timing of information passed from upstream groups (i.e., reconciliations, corporate actions, SDM), the creation of the NAV, and the dissemination of the NAV internally and externally.
- **Eagle STAR Fund Accounting Platform –** Performed an analysis of converting all mutual fund accounting within the bank to the Eagle STAR platform. The analysis consisted of evaluating client requirements and regulatory requirements in each world area, and identifying best in class practices at each mutual fund accounting location. Initial requirements for automated workflows were developed to efficiently process upstream information necessary for creation of the NAV.
- **Billing –** Explored sources of revenue leakage in the billing group and recommended an automated workflow system to resolve "unlinked accounts" in each world area
- **Location Strategy –** Identified a potential savings of $300 million per year by implementing efficiency projects and relocating manual activities from high cost locations to globally low cost locations.

SingleSource Roofing Corp
Director of Operations

Selected to improve performance of both the service department and new roofing installation projects.

- Developed operational metrics for both areas to begin a continuous improvement operating model.
- **Service Revenue –** Increased revenue by setting standard definitions for warranty vs. non-warranty work and communicated definitions with service department personnel and external customers.

- **Reorganization –** Reorganized the service and projects departments to outsource work resulting in a reduction in overhead costs.
- **Standardized Reporting** – Established standard reports for review at the daily business review meeting. The reporting provided a view of monthly costs and revenues and provided the early identification of issues.

DME Company
Plant Manager

Recruited to turn around performance of a strategic mold base and mold plate manufacturing facility.

- Engaged management team and shop floor workforce to eliminate waste in current operating procedures and practices. **MRP Implementation –** Reduced the number of overdue work orders from over 1,000 to less than 100 by reducing lot sizes and utilizing MRP in the production scheduling process.
- **Work in Process Reduction –** Decreased work in process inventory by $400,000 by changing the production scheduling process to focus on capacity of the process bottleneck and appropriate lot sizes.
- **Increased Sales –** Partnered with sales to develop a discount strategy for strategic and non-strategic customers that increased special plate sales by over 10% while maintaining profit margins at target.
- **Team Development** – Established objectives for the site and associated metrics to track progress against each of the site objectives.

Flexsys America L.P. (division of Solutia, Inc.)
Plant Manager / Assistant Plant Manager

Elevated within producer of rubber chemicals organization to oversee production and on-time delivery of products to customers.

Challenged with reducing fixed and variable costs, improving manufacturing processes, ensuring site safety, managing capital budgets, spearheading environmental performance activities, and developing employees in support of succession plan.

- **Safety Improvement** – Led an initiative to evaluate the safety controls at each of the seven global manufacturing locations (Germany, France, Brazil, Malaysia, Japan, and USA). The evaluation served as the basis for establishing minimum acceptable controls for the packaging equipment at each site.
- **Production Improvement –** Heightened production capacity 15% by collaborating cross-functionally to identify improvements and implement production personnel improvement recommendations.
- **Cost Reduction –** Lowered energy costs 2% while raising customer satisfaction rating to 95%+ from 82%+ by implementing a new management operating system focused on setting site goals and vision.
- **Accolade –** Recognized for leading team responsible for never missing a customer-requested ship date.
- **Project Management –** Tapped to serve as team lead on division strategy project team focused on developing company strategy involving pricing, new product development, production, and more.
- **Process Improvement –** Ensured compliance with corporate lock-out/tag-out procedures for first time in site history by creating and implementing formalized procedures enforced by management.

Production Superintendent

Managed the production department consisting of 12 operators, 3 general utility operators, 5 foremen and 1 production engineer. Ensured that the plant operated within all permit limits while achieving production requirements. Verified all production procedures, made recommendations for modifications to production procedures, and modified existing production procedures to ensure all application regulations were being considered.

Production Engineer

Responsible for the day to day activities of a single Crystex manufacturing plant including: monitoring the steam and cooling water systems, modifying the plant control system to support start-up and shutdown activities as well as process improvement projects, reviewing and creating standard operating procedures that incorporated safety and environmental impacts, and serving as production foreman during time of significant vacations.

Senior Process Engineer – Crystex Technology Group

Supported the seven Crystex manufacturing plants located around the world by troubleshooting existing operations, monitoring product quality and operational costs, recommending process improvements, and serving as project manager for strategic capacity upgrade, quality improvement, and new product grade introduction projects.

Eichleay Engineers Inc.

Senior Process Engineer

Responsible for the process engineering aspects of assigned projects. Activities ranged from performing heat and material balances to sizing process equipment to preparing capital cost estimates. Clients consisted of steel and chemical companies with projects ranging from evaluation of current operations to brownfield improvement projects to battery limits/greenfield projects. Projects included performing design calculations for a new coke oven gas desulfurization facility.

Centerline Engineering Corporation

Process Engineer

Responsible for performing process engineering calculations and field studies associated with the fugitive emissions of a coke oven byproducts plant. Activities included evaluating the condition of the installed equipment and providing plans for repair and/or replacement of the equipment.

EXHIBIT B

ERIE COKE CORPORATION
ERIE, PA

COKE-SIDE SHED CAPTURE ENGINEERING EVALUATION AND COMPLIANCE PLAN

PREPARED APRIL 2019

TABLE OF CONTENTS

INTRODUCTION

Erie Coke Corporation ("ECC") has prepared this *Coke-Side Shed Capture Engineering Evaluation and Compliance Plan* (the "Capture Plan") in response to a Pennsylvania Department of Environmental Protection Administrative Order dated February 4, 2019.

Coke-side shed capture can be reduced by 4 primary factors:
1) Reduced baghouse fan flow
2) A wind-tunnel effect on windy days
3) Increases in shed particulate load
4) Shed outside surface area leaks

All 4 of these primary factors were traced to evaluate each of their individual roots and their potential causes. A corrective action plan was prepared to address the factors and/or sub-factors that will be most effective in reversing decreased coke-side shed capture and in achieving more consistent regulatory compliance as soon as possible.

See the attached *Coke-Side Shed Capture Potential Cause Diagram* for a comprehensive summary of all potential causes and their potential roots. The following pages summarize all of these roots and suggest 39 Action Items ("AIs") that can be used to address each of them even if they were not found to be presently contributing significantly to reduced shed capture. Each of the 39 AIs, and the action recommended to address each item, are presented in the attached *Coke-Side Shed Capture Compliance Plan Table*. A prioritized list of the most significant capture reduction contributors is summarized in the conclusion.

3. **Reverse Decreased Coke-Side Shed Capture**
    a. *Increase the Reduced Baghouse Fan Flow*
        i. Inspect fan belts, motors, fans and fan electric drives quarterly. Conduct maintenance as required. See **AI 1**.
        ii. Prevent obstructed fan inlet. See **Attachment 1.**
        iii. Maintain fan motor amperes. Because Erie Coke's baghouse fan system does not utilize a VFD to control fan speed, the amperage of the fan motor is a better indication of fan performance and fan flow.
    b. *Mitigate Wind-Tunnel Effect*
        i. Conduct an engineering evaluation of the shed roof preliminary design verses the as-built construction during the implementation of other corrective actions. Evaluation to be completed by July 14, 2019. See **AI 10**.
        ii. Evaluate the feasibility of a design to install a baffle system within the sheds to reduce air flow during wind tunnel events. Evaluation to be completed by July 14, 2019. See **AI 11**.
    c. Minimize Increased Shed Particulate Load Events
        i. Address coke-side door, frame and lentil leaks as per **Work Practices Plan ("WPP")**. See **AI 12**.
        ii. Minimize green pushes. See **Attachment 2.**
        iii. Minimize dusty pushes. See **Attachment 3.**
    d. *Eliminate Shed Outside Surface Area Leaks*
        i. Inspect and replace sections of shed seal between battery top and collecting-main between stand-pipes annually. See **AI 37**.
        ii. Inspect and repair roof and wall sheeting annually. After the first round, sheeting repairs identified during inspections will be conducted within 3 months of each inspection. See **AI 38**.
        iii. Inspect and replace any damaged or missing end flaps and end sheeting. After the first round, repairs identified during inspections should be conducted within 3 months of each inspection. See **AI 39**.

ATTACHMENT 1

1. **Prevent Obstructed Fan Inlet.** The baghouse fans are not driven by VFDs, therefore they run at nearly continuous and constant speed while running. Whenever the fan inlet is obstructed for any reason the result will be: 1) Restricted air flow to the fan, 2) Less work load on the fan, and 3) Lower fan motor amperage. Whenever fan motor amperage is running lower than its normal operating range, it is necessary to conduct the following corrective actions regardless of the schedules defined below. After a period of restricted air flow (and attendant reduced air velocity) it will be necessary to inspect the shed suction mains and dust collection hoods for breeze that accumulated during the low flow period. See **AI 2**.
    a. Inspect Baghouse Hoppers Quarterly for Breeze Accumulation. See **AI 3**.
        i. Inspect hopper breeze screws and rotary discharge valves and carry out preventative maintenance quarterly. Conduct repairs when necessary. See **AI 4**.
        ii. Visually inspect the hopper breeze for moisture in the warmer months or frozen conditions in the colder months. **See AI 5**. If wet or frozen breeze is observed. See **Attachment 4**.
    b. Monitor Bag Integrity for Permeability. When permeability is compromise, the differential pressure across the baghouse will be higher than the normal operating range. Whenever the differential pressure is running higher than its normal operating range, it is necessary to conduct the following corrective actions regardless of the schedules defined below.
        i. Visually inspect the bottom of the bags quarterly from the hopper inspection ports. See **AI 6**. Look in particular for breeze accumulation stuck to and between the outside surfaces of the bags. If the bags are visibly congested, conduct cleaning operations to restore the surfaces to normal operating conditions. If extensive bag cleaning operations are inadequate to restore system function, schedule bag replacement. In this case multiple in-house pulse-jet bag cleaning cycles may have led to permanent micro-particulate infiltration into the bag weave.
        ii. Inspect the in-house bag cleaning pulse jet system and carry out preventative maintenance quarterly. Conduct repairs when necessary. See **AI 7**.
        iii. Inspect the hopper breeze for moisture in the warmer months or frozen conditions in the colder months. If wet or frozen breeze is observed, see **Attachment 4**.

ATTACHMENT 2

1. **Minimize Green Pushes.**
    a. Prevent Short Coking Time for Present Battery Temperature.
        i. Minimize inconsistent pushing cycles that may cause ovens to be pushed early.
        ii. Prevent mistakes leading to pushing errors that cause the wrong oven to be pushed before it is coked out. See **AI 14**.
        v. Maximize the number of ovens in line; minimize the quantity of stickers (stuck ovens). When fewer ovens are in line at any given time, a greater the coking temperature (and a lower the coking-time) is required to achieve a given production rate. Each sticker must be individually examined and studied to find the unique reason it is not pushing, see **AI 15**. See **Attachment 9** for further information on hard pushing and/or stickers.
    b. Reduce Local Compromised Wall Heating.
        i. Prevent flue pressure dysfunction. See **Attachment 5**.
        ii. Reduce dysfunctional flue combustion. See **Attachment 6**.
    c. Minimize Compromised Systemic Battery Heating.
        i. Control systemic heating dysfunction. See **Attachment 7**.

ATTACHMENT 3

1. **Minimize Dusty Pushes.**
    a. Stickers and/or Hard Pushing
        i. Maintain good coking coal bend. See **AI 16**.
        ii. Reduce coal blend variation. See **AI 16**.
        iii. Prevent flue pressure dysfunction. See **Attachment 5**.
        iv. Reduce dysfunctional flue combustion. See **Attachment 6**.
        v. For general discussion see **Attachment 9**.
    b. Reduce Local Compromised Wall Heating.
        i. Prevent flue pressure dysfunction. See **Attachment 5**.
        ii. Reduce dysfunctional flue combustion. See **Attachment 6**.
    c. Minimize compromised Systemic Battery Heating.
        i. Control systemic heating dysfunction. See **Attachment 7**.
    d. Coal Blend Mix or Variation
        i. Maintain good coking coal blend. See **AI 16**.
        ii. Reduce coal blend variation. See **AI 16**.

ATTACHMENT 4

1. **Eliminate Wet or Frozen Baghouse Breeze.** When the baghouse breeze is wet or frozen check for the presence of the following conditions:
    a. Precipitation Infiltration into the Baghouse Structure.
        i. Inspect the baghouse structure for roof and/or wall leaks quarterly. Repair and seal outside surfaces of the baghouse structure to prevent this leakage. See **AI 8**.
    b. High Humidity Infiltration into Baghouse.
        i. Continuous or excessively high humidity within the shed structure will contribute to baghouse breeze moisture.
        ii. Potential sources for this high humidity can be either atypically high moisture weather conditions or excessive quench polishing on the Coke Wharf.
        iii. If the coke is requiring higher than normal quench polishing on the Coke Wharf, inspect the coke quench system for adequate quench water flow and quench time. Adjust or repair quench system as necessary to address this issue. See **AI 9**.

ATTACHMENT 5

1. **Prevent Flue Pressure Dysfunction.**
    a. Measure and inspect Battery Wall Flue Pressures Quarterly. See **AI 18**.
        i. Make corrections to the air box settings (finger bars) as necessary to adjust walls that require higher or lower flue pressures as the case may be. Adding finger bars to a given wall's air supply (or box) will reduce that wall's flue pressure; taking off finger bars will increase that wall's flue pressure.
    b. Measure All Waste Heat Box Suctions Once Per Year. See **AI 19**.
        i. Conduct systemic quadrant valve setting adjustments to optimize suction balance across the battery if needed. Opening any given quadrant valve will decrease the flue pressure in that wall; closing a quadrant valve will increase the flue pressure in that wall.
    c. Visually Inspect Mushroom Valve Linkage and Chains Once Per Day. See **AI 20**.
        i. If any malfunctions (broken chains, propped open valves, broken or frozen linkages) are observed, take necessary action or conduct the necessary repairs as soon as possible. Conduct more extensive mechanical inspection every two years.
        ii. Lubricate mushroom valve linkages monthly. See **AI 21**.

ATTACHMENT 6

1. **Reduce Dysfunctional Flue Combustion.**
    a. Inspect, Identify and Correct Plugged or Blocked Flues. See **AI 22**.
    b. Inspect, Identify and Correct Plugged or Blocked Gas Nozzles on A-Battery or Gas Risers on B-Battery. See **AI 23**.
    c. Inspect, Identify and Correct Plugged or Blocked Air-Ports. See **AI 24**.
    d. Inspect Identify and Replace Missing Nozzles. See **AI 25**.
    e. Cold End Flues
        i. Inspect end flues (3 flues in from each end) quarterly and conduct heating work as described in the **WPP** to eliminate cold end flues. Update **WPP** if necessary, to reflect advanced methods of end flue work. See **AI 26**.
        ii. Control systemic heating dysfunction. See **Attachment 7**.

ATTACHMENT 7

1. **Control Systemic Heating Dysfunction.**
    a. Minimize Stack Draft Dysfunction
        i. Minimize waste heat temperature fluctuations: Maintain waste heat temperature above minimum required for given operating conditions. See **AI 27**. Stack draft is positively correlated with both waste-heat-gas and stack temperature.
        ii. Reduce stack draft damper malfunctions: Inspect draft damper system quarterly and conduct maintenance as required. See **AI 28**.
        iii. Be aware of ambient temperature fluctuations: Be on alert that ambient temperature fluctuations impact the differential temperature between the waste-heat-gas inside the stack and the temperature outside the stack. See **AI 29**. This differential temperature is positively correlated with stack draft.
    b. Reduce COG Fuel Pressure Fluctuations Caused by Manifold (or Battery Gas Main) Pressure Fluctuations.
        i. Minimize Blocked COG pre-heater and/or piping: Electrostatic tar precipitator dysfunction can cause tar transfer to the battery heating system which in turn can block the COG pre-heater and/or fuel gas supply piping. Bypass, inspect and clean the electrostatic tar precipitator twice per year to prevent this. See **AI 30**.
        ii. Reduce fluctuating COG plant pressure. See **Attachment 8**.

ATTACHMENT 8

1. **Reduce Fluctuating Coke Oven Gas Plant Pressure.** Fluctuating gas pressure has the potential to cause battery manifold or battery-gas-main pressure fluctuations leading to coke-oven-gas fuel pressure fluctuations which can cause alternating and intermittent high and low fuel gas flows. The following actions will reduce the incidence of all these fluctuations:
    a. Reduce Incidence of Primary Cooler Blockages by Monitoring Pressure Drop Across the Primary Cooler and by Hot Flushing the Primary Cooler When Necessary. See **AI 31**.
    b. Reduce Coke-Oven-Gas Main Blockages by Monitoring Plant Gas Pressure Distributions and Drops to Identify and Address Suspect Sections of Piping or Vessels Before They Become Debilitating. See **AI 32**.
    c. Monitor Operating Exhauster and Suction System Control Function, see **AI 33**. Conduct Preventative Maintenance on 1) Exhausters to Assure Proper Lubrication (**AI 34**) and 2) on the Exhauster VFDs to Identify Cooling Fan Failure or Fan Filter Plugging (**AI 35**).
    d. Reduce Incidence of Gas Absorber Blockages by Monitoring Pressure Drop Across the Absorber and by Hot Flushing the Absorber/Thionizer System as preventative maintenance. This has been observed to require attention approximately every other month or about 7 times per year on average. See **AI 36**.

ATTACHMENT 9

1. **Reduce the Incidence of Hard Pushes and/or Stickers.**
    a. Maintain Consistent Pushing Cycles.
        i. Schedule ovens in a consistently spaced pushing pattern with a coking-time that corresponds to the present battery temperature. Stick to the schedule as much as possible. See **AI 13**.
    b. Coal Blend Characteristics.
        i. Continue to produce, mix and pulverize a coal blend that shrinks at the end of the coking cycle to help facilitate easier pushing. See **AI 16**.
    c. Conduct Monthly Inspections of the Inside Surfaces of Walls and Floors of Ovens with Higher Than Average Pushing Current. See **AI 17**.
        i. Higher Amp pushing ovens, or historically harder pushing ovens, require smoother than average inside surfaces to help facilitate easier pushing. Especially check the tie-in joint on oven walls that have previously had end flue repairs and smooth that joint if necessary, to reduce wall friction.

CONCLUSION AND COMPLIANCE PLAN

39 Action Items ("AIs") were identified and prioritized. The following 14 (35.9% of them) were identified as priorities to improve shed capture:

1. Inspect shed suction mains and dust collection hoods for breeze accumulation (**AI 2**)
    a. Projected Completion Date: April 30, 2019.
2. Clean breeze accumulation out of baghouse hoppers (**AI 3**)
    a. Completed February 15, 2019. Next Inspection Date: May 15, 2019
3. Inspect breeze screws and rotary discharge valves quarterly (**AI 4**)
    a. Completed January 30, 2019. Next Inspection Date: April 30, 2019
4. Inspect baghouse hopper breeze moisture (**AI 5**)
    a. Completed January 30, 2019. Next Inspection Date: April 30, 2019
5. Conduct enhanced baghouse bag cleaning (**AI 6**)
    a. Completed by FOS April 6, 2019.
6. Inspect the in-house bag cleaning and pulse-jet system quarterly (**AI 7**)
    a. Projected Completion Date: April 30, 2019
7. Repair baghouse structure roof and/or wall leakage (**AI 8**)
    a. Projected Completion Date: July 14, 2019
8. Conduct PE engineering evaluation of shed roof preliminary design vs. "as-built" (**AI 10**)
    a. Projected Completion Date: July 14, 2019
9. Evaluate feasibility of a baffle system within the shed to mitigate wind with PE (**AI 11**)
    a. Projected Completion Date: July 14, 2019
10. Reduce the number of stuck ovens down to less than 5 ovens (**AI 15**)
    a. Projected Completion Date: January 1, 2020
11. Clean out the electrostatic tar precipitator (**AI 30**)
    a. Completed January 9, 2019. Next Completion Due July 9, 2019
12. Replace deteriorated topside sections of main-to-shed seal (**AI 37**)
    a. Projected Completion Date: December 1, 2019
13. Repair or replace any damaged shed roof and/or wall sections (**AI 38**)
    a. Projected Completion Date: December 1, 2019
14. Repair or replace any missing flaps or shed-end sheeting (**AI 39**)
    a. Projected Completion Date: January 1, 2020

The identified causes that these 14 action items address are designated on the *Coke-Side Shed Capture Potential Cause Diagram* by a bold box outline.

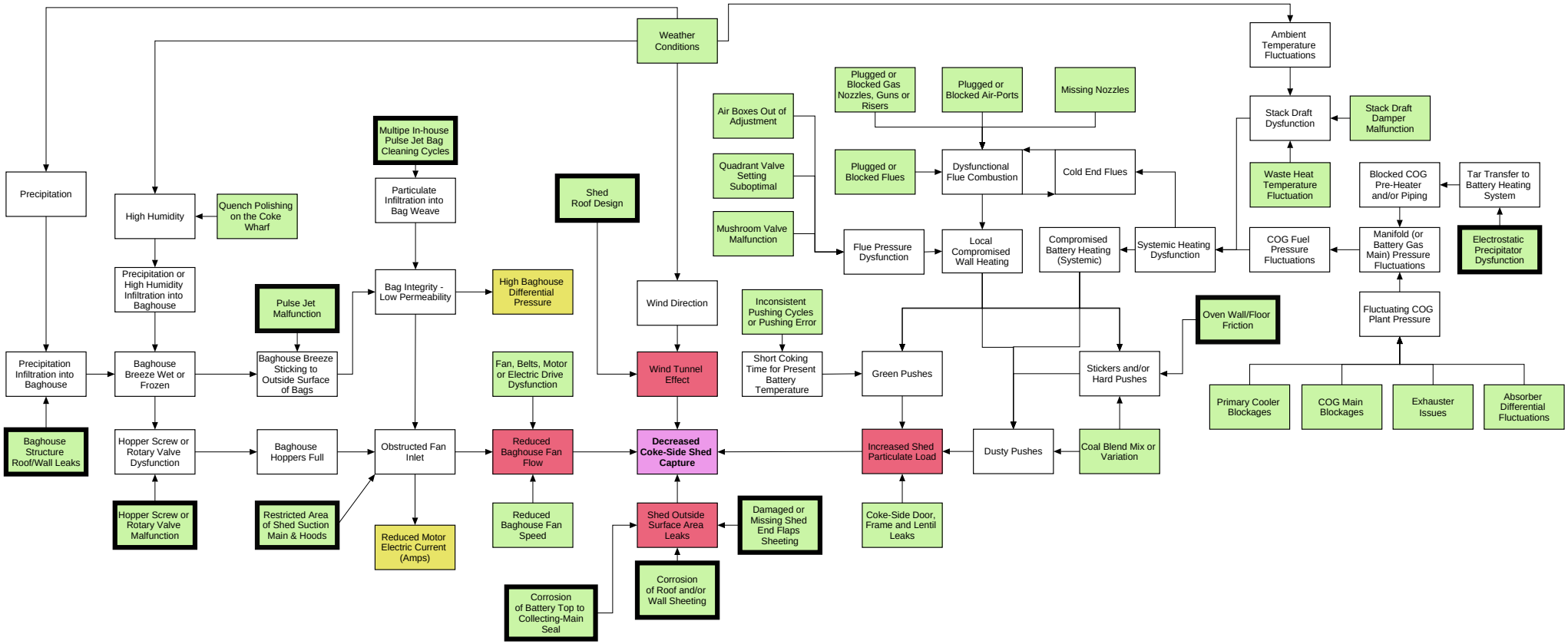
25 of the 39 AIs identified (64.1% of them) are of lower priority and/or are directly related to operations practices. These 25 items need to be evaluated as a source for future modifications of the **Work Practice Plan** ("**WPP**") and incorporated into the future training of operators. The **WPP** and training schedules will be modified to enhance these issues by August 15, 2019.

As can be seen above, most of this work will be completed during the summer of 2019 and all of it will be completed before the end of 2019. It is estimated that the completion of this work will have a very positive impact on compliance status of the facility.

COKE-SIDE SHED CAPTURE COMPLIANCE PLAN TABLE

ERIE COKE CORPORATION

AI	Inspections, Evaluations, Engineering Studies	Frequency	Starting	Actions	Completion Date
1a	**Maintain Baghouse Fan Flow**				
1	Inspect fan belts, motors, fans and fan electric starters	Quarterly	Apr-19	Inspect baghouse fans & systems	April 30, 2019
2	Inspect shed suction mains and dust collection hoods for breeze accumulation	After baghouse hopper and bag cleaning	Apr-19	Inspect shed mains and hoods	April 30, 2019
3	Inspect baghouse hoppers for breeze accumulation	Quarterly	Jan-19	Hoppers were already cleaned out	February 15, 2019
4	Inspect breeze screws and rotary discharge valves	Quarterly	Jan-19	Inspect Screws and rotary valves	January 30, 2019
5	Inpect hopper breeze for signs of moisture or ice	Quarterly	Jan-19	Hopper breeze moisture check	January 30, 2019
6	Visually inspect the bottom of the bags	Quarterly	Feb-19	Bags were already cleaned by FOS	April 6, 2019
7	Inspect the in-house bag cleaning pulse jet system	Quarterly	Apr-19	Pulse jet system inspection	April 30, 2019
8	Inspect baghouse structure for roof and/or wall leaks	Quarterly	Jan-19	Repair baghouse roof and wall leakage	July 14, 2019
9	Evaluate quench water volume and quench time for adequacy	Twice per Year	Jun-19	Quench proficiency optimization	June 30, 2019
1b	**Mitigate Wind-Tunnel Effect**				
10	Conduct engineering evaluation of shed roof preliminary design vs. "as-built"	One Time	May-19	Shed roof ngineering evaluation by PE	July 14, 2019
11	Evaluate feasibility of a baffle system within sheds to mitigate wind	One Time	May-19	Shed baffle engineering evaluation by PE	July 14, 2019
1c	**Minimize Shed Particulate Load**				
12	Evaluate WPP Method 303 fugitives for CS doors, frames and lentils	One Time	May-19	Update WPP if necessary, Training	August 15, 2019
13	Maintain consistent pushing schedules and stick to schedule as much as possible	Continuous	N/A	New training and regular supervision	August 15, 2019
14	Prevent mistakes leading to pushing errors	Continuous	N/A	New training and regular supervision	August 15, 2019
15	Examine each stuck oven (stickers), then customize repairs to get them in-line	One Oven Per Month	Jan-19	Reduce no. stuck ovens to less than 5	January 1, 2020
16	Mainatin a consistent coking coal blend that shrinks at the end of the coking cycle	Continuous	N/A	Corporate function	Ongoing
17	Inspect "high-amp" pushing ovens - especially for wall and floor deviations	Monthly	Apr-19	New training and regular supervision	August 15, 2019
18	Measure and inspect battery wall flue pressures	Quarterly	May-19	Make adjustments to air box settings	June 15, 2019
19	Measure waste heat box suctions	Annually	Nov-19	Make adjustments to quadrant valves	December 15, 2019
20	Visually inspect mushroom valve linkage and chains	Daily (Ops) and Every 2 Years (Mech)	N/A	Update WPP if necessary, Training	August 15, 2019
21	Lubricate mushroom valve linkages	Monthly	N/A	Update WPP if necessary, Training	August 15, 2019
22	Inpect, identify and correct plugged or blocked flues	20 walls per month	May-19	Update WPP if necessary, Training	August 15, 2019
23	Inpect, identify and correct plugged or blocked gas nozzles	20 walls per month	May-19	Update WPP if necessary, Training	August 15, 2019
24	Inpect, identify and correct plugged or blocked air-ports	20 walls per month	May-19	Update WPP if necessary, Training	August 15, 2019
25	Inpect, identify and replace missing nozzles	20 walls per month	May-19	Update WPP if necessary, Training	August 15, 2019
26	Inspect end flues	Quarterly	May-19	Update WPP if necessary, Training	August 15, 2019
27	Monitor waste heat temperature to maintain minimum	Continuous	N/A	Update WPP if necessary, Training	August 15, 2019
28	Inspect draft damper system	Quarterly	Jun-19	Update WPP if necessary, Training	August 15, 2019
29	Be aware of ambient temperature fluctuations and their impact on stack draft	Daily	Apr-19	Update WPP if necessary, Training	August 15, 2019
30	By-pass, inspect and clean the electrostatic precipitator	Twice per year	Jan-19	Precipitator was already cleaned	January 9, 2019
31	Monitor pressure drop across the primary cooler and hot flush when necessary	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
32	Monitor plant gas pressure distributions and drops and steam when necessary	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
33	Monitor COG Exhauster and battery suction system control	Continuous	N/A	BP Operator's Job, Training	August 15, 2019
34	Lubricate COG Exhauster	Every 2,000 hours	N/A	Update WPP if necessary, Training	August 15, 2019
35	Inspect COG Exhauster VFD fan and fan filter	Monthly	Apr-19	BP Operator's Job, Training	August 15, 2019
36	Monitor pressure drop across the Absorber and hot flush for maintenance	Six to Seven Times Per Year	N/A	Conduct regular maintenance and cleaning	Ongoing
1d	**Maintain Shed Outside Surface Area Sheeting**				
37	Inspect sections of the battery top/collecting main shed seal between standpipes	Annually	Jan-19	Replace topside sections main shed seal	December 1, 2019
38	Inspect shed roof and wall sheating and repair or replace sections as needed	Annually	Apr-19	Repair shed roof and wall sections	December 1, 2019
39	Inspect for damaged or missing end-flaps sheeting and repair or replace as needed	Annually	May-19	Repair end flaps or end sheeting	January 1, 2020



ERIE COKE CORPORATION

PUSHING EMISSION CONTROLS (PEC)

POTENTIAL CAUSE DIAGRAM FOR Coke-Side Shed Capture

April 4, 2019

Studied Effect

Primary Cause

Independent Cause

Side Effect

Exhibit C

ERIE COKE COMPANY
ERIE, PA
WORK PRACTICE CONTROL PLAN
PREPARED APRIL 2019
ECC Work Practice Control Plan Revision 0 –

TABLE OF CONTENTS

1. Introduction

Erie Coke Corporation ("ECC") has developed this emission control Work Practice Plan (the "Plan") pursuant to 40 CFR § 63.306 for its two coke oven batteries: Battery A and Battery B. Both batteries are By-Product Coke Oven Batteries, as defined under 40 CFR § 63.301. In accordance with these regulations, the Plan is designed to achieve compliance with visible emission limitations for coke oven doors, topside port lids, offtake systems, and charging operations. This Plan also includes emissions controls procedures and practices for the coke side shed baghouse, daily baffle washing, under-firing gas parameters, and battery operating temperatures.

2. Work practice plan training requirements 40 CFR 63.306

2.1. A list, by job title, of all personnel that are required to be trained and the potential emission point(s) associated with each job title. If a cell is blank, then training on the subject potential emission point is not required for the subject job title. If the cell is anything other than blank, training of the type indicated in the cell is required, per Section 2.2 below.

Title	Pusher Side Doors	Pushing	Charging	Offtakes	Lids	Coke Side Doors	Standpipes	Standpipe Caps	Goosenecks	Dampers	Mains	Oven Roofs	Fugitive Dust	COMS	Steam System	Liquor System
Pusherman (Pusher Machine)	X	Y						Y	Y							
Larryman (Charge Car)			X	X	X			X	X	X	X	X				
Backman (Back Door Machine)						X										
Quench Car Operator		X				Y										
Cokeman (Screening/Loading)													X			
Wharfman (Wharf Gates)													Y			
Trainee (Jumper)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
Heater				Y	Y		Y	Y	Y	Y	Y	Y		X		
BP Operator (By-Products)																
Oven Turn Foreman	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Battery General Formen	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
Plant Superintendent	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
X = On the Job Responsibility																
Y = Alternate Responsibility																
M = Management Responsibility																
MS and CVL 2-15-19																

2.2. For subjects to be covered in the initial and refresher training for each group of personnel, see Appendix A.

2.3. Statement of the duration of initial training and the duration and frequency of refresher training.

Initial training will be 80 hours of classroom instruction, Power Point Presentations, Video and On the Job (OTJ) training. Refresher training will be 60 minutes per month and 3 hours annually.

2.4. Description of the methods to be used at the completion of initial or refresher training to demonstrate and document successful completion of the initial and refresher training.

Successful completion of training will be demonstrated through employee testing and documentation of pass/fail performance on a post-training examination. Failure to adequately display a working knowledge of systems and equipment will result in retraining.

Training records for all participants, including managers, will be kept in the ECC employee training documentation system.

See Appendix A for additional details on training content and documentation.

3. Work practice plan for coke oven doors 40 CFR 63.306 (2)

1. Door Emission Control Work Practices Program

A. Inspection and Cleaning of Doors and Jambs

1. Inspection of Oven Doors and Jambs

a. Each door, door jamb, and jamb refractory on an oven is to be visually inspected by the Pusherman on the pusher side and the Backman on the coke side after each time the oven is pushed and before the doors are reattached, to determine whether there is any buildup of carbon or tar or any other conditions which may interfere with an airtight oven seal.

b. Each oven wall and lentil are to be inspected by operating personnel on the benches after each push to determine whether there are any conditions that may interfere with proper oven operation.

c. Visible issues with the inspected components (including without limitation defects) are immediately to be brought to the attention of the Oven Turn Foreman by the operating personnel on the benches.

d. Pusher Machine Operators are to visually inspect chuck doors and jambs for noticeable issues before the oven is charged. Any such issues are to be reported to the Oven Turn Foreman immediately.

e. The Oven Turn Foreman is to either (1) direct any immediate changes or repairs as soon as possible, where the issue is capable of immediate resolution, or (2) record the defect in writing, where it is not capable of immediate resolution, for later action in the Battery Foreman's report. This report shall be completed prior to the conclusion of the Oven Turn Foreman's shift. Any matters reported for later action in the Oven Turn Foreman Report shall be addressed as soon as practicable.

2. Manual Cleaning of Oven Doors and Jambs

a. An oven's doors and jambs on the coke side of the battery are to be cleaned by the Backman and the Quench Car Operator before the oven is pushed.

b. An oven's doors and jambs on the pusher side of the battery are to be cleaned by the Pusherman before the oven is pushed.

c. The cleaning of the doors and jambs and sills entails the removal of any buildup of carbon or tar that would interfere with the proper sealing of the door and jamb.

d. Cleaning of doors and jambs is to be accomplished by manually operated scraping bars or air tools.

e. The Pusherman is to clean the chuck doors and chuck door jambs before the chuck door is sealed to the extent needed to maintain performance.

f. The Pusherman and Backman are to clean the oven sill of any spillage so that doors can be replaced and latched securely.

3. Conformance with Specifications

a. Inspection by operating personnel such as Pusherman and Backman is to be limited to visual inspection of the sealing components for cleanliness and physical damage.

4. Recording and Certification

a. The Battery Foreman's Report for each shift shall record and certify that this Section 3.1.A was fully implemented, and if there are exceptions to that implementation, shall record the nature of, reasons for, and response taken regarding those exceptions.

B. Door Repair and Replacement

1. Door Repair and Replacement

a. "Off" Battery Inspection and Cleaning

1) Per Section 3.1.A.e(2), the Oven Turn Foreman is to compile a list of door and jamb leaks which cannot be controlled and problem doors on his turn in the Oven Turn Foreman's Report

2) The Battery General Foreman is to assign doors to be taken out of service, cleaned and inspected. A door to be taken out of service per the Oven Turn Foreman's Report shall be removed from service within 2 shifts from the shift for which the door was identified in the Oven Turn Foreman's Report. Oven doors at ECC are typically scraped clean and re-mudded.

3) Each door assigned to be taken out of service is to be temporarily taken off the oven and replaced with a substitute door. The door is then taken to the cleaning rack and given a thorough cleaning and inspection. Based on this inspection by the Battery General Foreman, a Special Door Inspection Report is to be written describing the corrective action needed on the door. Special Door Inspection Reports are to be submitted to the Maintenance Foreman. Pending action on Special Door Inspection Report, a door may be placed back in service to the extent needed based on the availability of substitute doors and the relative priority of other, potentially more significant door repairs. In such a situation, the placement of a door back in service, and its removal from service for further repair, shall be recorded in the Special Door Inspection Report.

b. Door Repair

1) Based on the information in the Special Door Inspection Report the Maintenance Foreman is to provide a schedule of doors to be repaired.
2) Each oven door to be replaced is to be thoroughly inspected by the Maintenance Foreman or his designee, who is to direct the Repairmen in the correct method of repairing the defective door.
3) The Maintenance Foreman is to keep records of when door repairs were received, what repairs were done, and when the work was completed. Door-related refractory repairs are performed by the patchers under direction of the Battery General Foreman

2. Recording and Certification Procedures for Door Leak Identification

The following reports are to be generated and signed/certified to their accuracy:
a. Special Door Inspection Reports
b. Door Repair Reports

C. Identifying Leaks and Reporting Chain of Command

1. Identifying Door Leaks

a. Recently Charged Ovens

1) After a door has been replaced and the oven has been charged and leveled, the Pusherman and Backman are to inspect the door for leaks according to EPA Method 303. The operator is to report to the Oven Turn Foreman leaks which will not reseal after repeated reluting efforts.

b. Other Ovens

1) The following personnel have responsibility for identifying door leaks if identified using EPA Method 303 or otherwise:

Personnel	Report Leaks To
Backman	Oven Turn Foreman
Pusherman	Oven Turn Foreman

2. Chain of Command for Reporting Door Leaks

a. The Oven Turn Foreman is to maintain a daily list of leaks and problem doors.
b. This list is to be included in the Battery Foreman's Report.
c. The Battery Foreman's Report is to be submitted to the Battery General Foreman.

3. Corrective Action

a. If door leakage is observed by the Backman or Pusherman, they will inspect the leaks to determine the cause of the leaks and take corrective action. Minor leaks should be reluted. If the leak requires more extensive correction or repair, the leak is to be reported to the Oven Turn Foreman.

b. The information on the Battery Foreman's Reports are to be used to prepare a list of doors that need to be taken out of service for a special cleaning and inspection and for subsequent repairs (as required), as described in Section 3.1.B.

4. Recording and Certification

The following reports and records are to be generated and certified:

a. Battery Foreman Report
b. Special Door Inspection Report
c. Door Repair Reports

D. Hand Luted Doors

1. Luting and Reluting Procedures

a. After an oven has been pushed and before the next charge to that oven, the doors and jambs on the coke side are to be cleaned in accordance with the procedures specified (II) (A) (2) (a)

2. Recording and Certification

a. Recording and certification for this section is to be accomplished as explained under Section II. A. – Inspection and Cleaning of Doors.

E. Inventory Procedures for Spare Doors and Jambs

1. The Battery General Foreman or his designee is to observe, on a weekly basis, the spare door and jamb storage sites and record the number of spare coke side doors, spare pusher side doors, spare chuck doors that are in inventory, out-of-service doors and record this on the Door Inventory Report. His Door Inventory Report is to be given to the Plant Superintendent.

F. Monitoring and Controlling Collection Main Back Pressure

1. Monitoring of Back Pressure (Equipment and Procedures)

-

a. The pressure of the coke oven gas in the collecting main at the battery (back pressure) is continuously recorded.

b. The back pressure is to be observed a minimum of 4 times per 8-hour shift by the Heaterman.

2. Inspection and Calibration

a.The back pressure controller is to be visually inspected daily by the Heaterman for proper set-point and control. The Heaterman is to generate and maintain a record indicating that the Heaterman has completed this inspection. The Heaterman is responsible for the following for the Recording Charts: review at least daily, change daily, and maintain with a record with each Recording Chart indicating completion of daily review.

b. Back pressure instrumentation is to be checked for calibration on a monthly basis by the Instrumentation Dept.. c. Collector mains are to be inspected by the Battrey Supervisor monthly for tar buildup.

d. Impulse lines are to be inspected monthly by the Instrument Dept.

3. Corrective Action Procedures

a. If the back pressure control valve does not maintain the desired pressure, the Dept. Forman shall determine whether the problem is because of inadequate position of the "trim" valve, a malfunction of the pressure measurement/control instrument, or some other problem.

b. Position of the trim valve in the by-products suction main is to be adjusted by the Dept. Forman if it is identified as the problem.

c. If the regulator itself is malfunctioning, it is to be repaired as soon as possible. Pressure should be manually controlled, if appropriate, until the automatic controller is functioning properly.

4. Recording and Certification

a. The Recording Charts are maintained in the Plant Superintendent's office. They are to be placed there by each Dept. Forman . They are available to the Oven Turn Foreman, Oven General Foreman, and Instrument Repairman. The Heaterman is responsible for the following for the Recording Charts: review at least daily, change daily, and maintain with a record with each Recording Chart indicating completion of daily review .

b. Problems with the back pressure monitoring and control system are to be communicated to the Battery Foreman and noted in the Battery Foreman's Report.

c. A record of corrective action taken in response to a problem in back pressure control is to be generated by the General Forman and kept by the Battery Supervisor until the problem is corrected.

d. The Instrument Repairman will keep a log of maintenance performed.

e. In addition to charts, a log of back pressure measurements is kept by the Heaterman.

f. Documentation will be created and maintained for all of the above-referenced regular inspections, even if the inspection does not reveal a problem.

G. Audits of Effectiveness of Inspection and Repair Program
Following the effective date of this Work Practices Plan April 2019, the Plant Superintendent is to implement the following evaluation of the door inspection program:

1. Evaluation of Door and Jamb Inspection Procedures / Equipment

a. The Plant Superintendent is to designate an experienced door inspector to evaluate the procedures (including the procedures set forth in this Section 3.1) used by one or more of the following personnel when executing their responsibilities related to inspection of doors and door cleaning equipment:

- 1) Backman
- 2) Pusherman
- 3) Quench Car Operator
-

b. The evaluator is to use a check list and randomly observe/evaluate several of the appropriate personnel in the previous Section for at least one door inspection.

c. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports significant deviation from the prescribed inspection procedures, the Plant Superintendent is to direct the Oven Turn Foreman to provide supplemental refresher training to the appropriate personnel. The supplemental refresher training is to include a review of the written job procedures for inspection, on-the-job training or other training deemed to be required by the Plant Superintendent.

d. The Oven Turn Foreman shall complete the supplemental training within 4 days and is to submit a report to the Plant Superintendent when the supplemental training has been completed.

2. Recording and Certification of Door Inspection Evaluations.
The following reports are to be kept as part of the audit records:

a. Evaluator's Report
b. Plant Superintendent Corrective Action Report directing that the supplemental training be conducted.
c. The Oven Turn Foreman Report certifying that the supplemental training required has been completed.

3. Evaluation of the Door Repair Program

a. The Plant Superintendent is to designate an individual experienced in door repair to conduct an evaluation of at least one door that has been repaired to confirm that the repaired door meets the specifications for repaired doors. The evaluator will use a check list. Such an evaluation is to be conducted at least once every three months.

b. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports a significant deviation from the prescribed specifications, the Plant Superintendent is to direct the Maintenance Foreman or Battery General Foreman to provide the supplemental refresher training to the appropriate personnel.

c. The Maintenance Foreman or Battery General Foreman is to complete such supplemental training within 4 days and report to the Plant Superintendent in writing when supplemental training has been completed.

d. Recording and Certification of Door Repair Evaluations.

The following reports are to be kept as part of the audit records:

1) Evaluator's Report.

- 2) Plant Superintendent Corrective Action Report directing that the supplemental training be conducted.
- 3) The Maintenance Foreman or Battery General Foreman Report certifying that the supplemental training required has been completed.

4. Work practice control plan for charging operations 40 CFR 63.306 (3)

4.1. Procedures for charging coal into the oven.
After pushing is completed, the coke side door is replaced and door secured with door latching mechanism.

A. Equipment Inspection and Repair

1. Larry Car

a. The following equipment on the larry car is to be visibly inspected by the larry car operator prior to the start of each shift:

1) Jumper pipe and smoke sleeves
2) Gasket seal material

b. Any abnormalities are to be immediately reported to the Oven Turn Foreman and documented in the Battery Foreman's Report for resolution as soon as practicable.

c. In addition, the plant Maintenance department is to perform and document a weekly mechanical inspection. Any abnormalities found are to be scheduled for repair. The Maintenance Foreman is to determine and document a schedule for repairs. The Maintenance Foreman is to assure that repairs are made on schedule.

2. Pusher Machine

a. The following equipment on the pusher machine is to be visibly inspected prior to the start of each shift:

1) Smoke Boot
2) Leveler Bar Cable

b. Any abnormalities are to be immediately reported to the Oven Turn Foreman and documented in the Battery Foreman's Report for resolution as soon as practicable.

c. In addition, the plant Maintenance department is to perform and document a weekly mechanical inspection. Any abnormalities found are to be scheduled for repair. Maintenance is to determine and document a schedule for the repairs. The Maintenance Foreman is to assure necessary repairs are made on schedule.

B. Evaluation of Effectiveness of Inspection and Repair Program

Following the effective date of this Work Practices Plan, April 2019 the Plant Superintendent is to implement the following program for evaluating charging procedures:

1. Evaluation of Charging Inspection Procedures

a. The Plant Superintendent is to designate an individual to conduct an evaluation of any procedures used by one or more of the following personnel in connection with executing their responsibilities for inspection of charging:

1) Larry Car Operator
2) Pusher Machine Operator

b. The evaluator is to use a check list and randomly evaluate the appropriate personnel in the previous Section for at least one charging inspection.

c. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports significant deviation from the prescribed inspection procedures, the Plant Superintendent is to direct the Oven Turn Foreman to provide supplemental refresher training to the appropriate personnel. The supplemental refresher training is to include a review of the written job procedures for inspection, on-the-job training or other training deemed to be required by the Plant Superintendent.

d. The Oven Turn Foreman is to complete the supplemental training within 4days and submit a report to the Plant Superintendent when the supplemental training has been completed.

e. Recording and Certification of Charging Inspection Evaluations. The following reports are to be kept as part of the evaluation records:

1) Evaluator's Report
2) Plant Superintendent Corrective Action Report directing that the supplemental training be conducted.
3) The Oven Turn Foreman's Report certifying that the supplemental training required has been completed.
4) Evaluator's completed check lists.

2. Evaluation of Charging Equipment Repair Program

a. The Plant Superintendent is to designate an individual experienced in charging equipment repair to conduct a repair evaluation of at least one of the following that has been repaired to confirm that the repair meets the specifications required:

1) Larry Car
2) Standpipes
3) Goosenecks
4) Charging Ring and Lid
5) Steam Supply System
6) Liquor Sprays

b. The evaluator is to report his findings to the Plant Superintendent. If the evaluator reports significant deviation from the prescribed specifications, the Plant Superintendent is to direct the Maintenance Foreman to provide supplemental refresher training to the appropriate personnel. The supplemental refresher training

is to include a review of the written job procedures for inspection, on-the-job training or other training deemed to be required by the Plant Superintendent.

c. The Maintenance Foreman is to complete the supplemental training within 4 days and submit a report to the Plant Superintendent when the supplemental training has been completed."

d. Recording and Certification of Charging Equipment Repair Evaluations. The following reports are to be kept as part of the evaluation records:

1) Evaluator's Report
2) Plant Superintendent Corrective Action Report directing that the supplemental training be conducted.
3) The Maintenance Foreman's Report certifying that the supplemental training required has been completed.

C. Procedures for Ensuring That Larry Car Hoppers Are Properly Filled

1. Move Larry Car to Loading Station.
2. Activate necessary equipment to deposit coal into Larry Car Hoppers.
3. Utilize visual inspection to determine that the Larry Car is loaded correctly by noting volumetrically filled to the jaws.

D. Procedure for Alignment of Larry Car over Oven

1. Move Larry Car over oven.
2. Visually align Larry Car exactly over the holes.

E. Procedure for Charging and Leveling

1. When an oven reaches its scheduled time for pushing, it shall be dampered off without removing more than one charging hole lid.

2. After the oven is pushed and inspected, after the doors are sealed (luted), and before charging, charging hole lids are to be removed, cleaned and replaced over the hole. Inspection of the standpipe, goosenecks and charging holes is to be done at this time. Any carbon build-up that would interfere with sealing is to be removed immediately.

3. On "A" Battery with the oven prepared for charging, the front steam is to be turned on slightly and the dampering valve is to be opened into the collector main. The Corliss is now to be rodded out [is it obvious what this means?]. The standpipe cap is to be closed and luted. The front steam is now to be turned on full. The #1 charging hole lid of the jumper oven is to be removed. The #5 and #1 charging hole lids are to be removed (#5 is next to the collector main) and the charging car is to be spotted over the holes.

4. On "B" Battery, with the oven prepared for charging, the front steam is to be turned on slightly and the dampering valve is to be opened into the collector main. The Corliss is now to be rodded out. The standpipe cap is to be closed and luted. The front

steam is to be turned on full. The liquor valve is to be shut off and the back steam is to be turned on full.

5. For BOTH batteries the liquor is now to be shut off on the jumper oven and steam valve or valves are to be turned on. The jumper oven is now ready to be utilized.

The normal charging sequence is as follows:

6. The charging hole lid of the jumper oven is to be removed. The #5 and #1 charging hole lids are to be removed (#5 is next to the collector main) and the charging car is to be spotted over the holes.

7. The #5 and #1 drop sleeves are to be lowered. The #5 slide gate is to be opened and the coal is to be dropped into the oven from #5 hopper.

8. When #5 hopper is empty, the slide gate is to be closed, the drop sleeve is to be raised, and the lid is to be replaced on the charging hole.

9. After the lid is replaced on the #5 charging hole, the #4 charging hole lid is to be removed, and the drop sleeve is to be lowered. The #4 slide gate is to be opened and coal is to be dropped into the oven from hopper #4.

10. When #4 hopper is empty, the slide gate is to be closed, the drop sleeve is to be raised and the lid is to be replaced on the charging hole.

11. The slide gate is now to be opened on #1 hopper, and the coal is to be dropped into the oven. When the #1 hopper is empty, the slide gate on that hopper is to be closed.

12. When the jumper pipe mechanism is still in place on the oven, the Larryman is to call for the leveler bar smoke boot (air seal) to be positioned on the oven being charged.

13. When the smoke boot is in place, the Larryman is to call for the leveling to start.

14. The #2 charging lid is to be removed, and the #2 hopper drop sleeve is to be lowered. The #2 slide gate is then to be opened and coal is to be dropped into the oven from the #2 hopper. When the hopper is empty, the drop sleeve is to be raised and the lid is to be replaced on the #2 charging hole.

15. The #3 charging lid is now to be removed, and the #3 hopper drop sleeve is lowered, and the slide gate is then to be opened. When the #3 hopper is empty, the drop sleeve is to be raised and the lid is to be replaced on the #3 charging hole.

16. The jumper pipe mechanism is now to be raised, and the two #1 charging hole lids are to be replaced.

17. The charging car is to be removed from the oven charged. After checking with the Pusherman, to confirm that the chuck door is closed and latched, any coal spills are to be swept into all 5 charging holes, one lid at a time, and the lids are to be luted.

18. The aspiration steam valves are to be turned back off, and the liquor valves are to be turned back on.

19. The standpipe caps and lids shall be re-luted to seal any gas leaks.

F. Procedures and Schedules for Inspection and Cleaning of Offtake System and Other Equipment

1. Standpipes – The Backman is to visually inspect the standpipe each time the oven is pushed to insure that it is not obstructed. Immediate cleaning can be completed with use of the cleaning tool or steam as necessary.

2. Standpipe Caps – The Larryman is to inspect the standpipe cap each time the oven is dampered off prior to pushing, and is to clean the standpipe cap with a hand bar or air gun as necessary to assure optimum emissions control performance.

3. Goosenecks – The Larryman is to inspect the gooseneck each time the oven is dampered off prior to charging, and is to clean the gooseneck manually with a hand bar or air gun to assure optimum emissions control performance.

4. Dampers and Mains – The Larryman is to inspect the damper to ensure its proper operation and is to inspect the main (e.g. the damper box and the part of the main in the vicinity of the oven being pushed) for leakage each time the oven is pushed, and is to report any leakage to the Ovens Turn Foreman.

5. Oven Roofs - The Larryman is to inspect oven roofs for damage and excessive carbon buildup each time the oven is pushed. If roof carbon or damage is found, the Larryman is to contact the Ovens Turn Foreman to determine whether and what cleaning or other corrective action is required.

6. Charging Holes – The Larryman is to inspect the charging holes each time the oven is dampered off prior to pushing, and is to clean charging holes manually with a hand bar or air gun as required.

7. Charging Lids – The Larryman is to inspect the charging hole lids each time the oven is dampered off, and is to clean lids manually with a hand bar or air gun as required.

8. Steam System – The Larryman is to inspect the steam system visually before each charge to insure they are in good working order, and is to report any defects to the Ovens Turn Foreman.

9. Liquor System – The Larryman is to visually inspect the liquor spray in the gooseneck before each charge to insure adequate liquor. Sprays are also to be checked daily by Heaters to note liquor flow, by checking the oven temperature of the spray

pipes. Any defects are to be reported to the Oven Turn Foreman to determine whether and what cleaning or other corrective action is required.

5. Work practice plan for Topside Port Lids 40 CFR 63.306 (4)

Topside Lid Emission Control Work Practices Program

A. Inspection, Cleaning, Repair and Replacement of Topside Lids

1. Topside lid castings and lids are to be inspected after each oven is pushed and shall be cleaned as needed.

2. Defects are to be immediately brought to the attention of the Oven Turn Foreman.

3. The Oven Turn Foreman is to either direct immediate change if the defect is susceptible to immediate correction, or record the defect on the Battery Foreman Report before the end of the Oven Turn Foreman's shift.

4. The Battery General Foreman or his designee is to review the Oven Turn Foreman Report daily, and should schedule repair or replacement to be performed as soon as practicable.

B. Sealing / Resealing of Topside Lids

1. The Larryman is to seal all topside lids on each oven charged.

2. The Larryman is to visually inspect newly sealed lids, and immediately reseal as necessary.

3. Any lid emission that cannot be sealed is to be reported to the Oven Turn Foreman and logged on the Battery Foreman Report before the end of the Oven Turn Foreman's shift. The Battery Foreman Report is to be submitted to Battery General Foreman for the immediate scheduling of repairs, to be completed as soon as practicable.

C. Evaluations of Effectiveness of Inspection and Repair Program
Following the effective date of this Work Practices Plan, April 2019, the Plant Superintendent is to implement the following evaluation of the topside lid emissions program:

1. Evaluation of Lid Inspection Procedures

a. The Plant Superintendent is to designate individual to conduct an evaluation of the procedures used by the Larryman for inspection of holes.

b. The evaluator is to use a check list and randomly evaluate the Larryman for at least one lid inspection.

c. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports significant deviation from the prescribed inspection procedures, the Plant Superintendent is to direct the Oven Turn Foreman to provide supplemental refresher training to the Larryman. The supplemental refresher training is to include a review of the written job procedures for inspection, on-the-job training or other training deemed to be required by the Plant Superintendent.

d. The Oven Turn Foreman is to complete the supplemental training within 4days and submit a report to the Plant Superintendent when the supplemental training has been completed.

e. Recording and Certification of Lid Inspection evaluations. The following reports are to be kept as part of the evaluation records:

1) Evaluator's Report
2) Plant Superintendent Corrective Action Report directing any supplemental training to be conducted.
3) The Oven Turn Foreman Report certifying that the supplemental training required has been completed.

2. Evaluation of Lid Replacement Program

a. The Plant Superintendent is to designate an experienced individual to perform an evaluation of at least one of the following that has been repaired to confirm that the repair meets the specifications required.

1) Lid
2) Lid Casting

b. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports a significant deviation from the prescribed specifications, the Plant Superintendent is to direct the Battery General Foreman to provide supplemental refresher training to the appropriate personnel.

c. The Battery General Foreman is to complete the supplemental training in 4 days and submit a report to the Plant Superintendent when the supplemental training has been completed.

d. Recording and Certification of Lid Repair / Replacement Evaluation. The following reports are to be kept as part of the audit records:

1) Auditor's Report
2) Plant Superintendent Corrective Action Report directing that supplemental training be conducted.
3) The Battery General Foreman Report certifying that the supplemental training required has been completed.

6. Work practice plan for Offtake Systems 40 CFR 63.306 (5)

Offtake System Emission Control Work Practices Program

A. Inspection, Repair, and Replacement of Offtake System Components

1. The Larryman is to perform a daily visual inspection of offtake system components on each oven to be charged, prior to charging.

2. The Larryman is to perform a daily visual inspection of the standpipe cap and mating surface on each oven charged, prior to charging, and clean as required.

3. Defects are to be brought to the attention of the Oven Turn Foreman immediately.

4. The Oven Turn Foreman is to either direct immediate change if the defect is susceptible to immediate correction, or record the defect on the Battery Foreman's Report, and submit report to the Battery General Foreman for the immediate scheduling of repair within 2 shifts.

5. The Oven Turn Foreman is to perform a daily visual inspection of offtake system performance. Results are to be logged on the Battery Foreman's Report.

6. The Battery General Foreman or his designee is to review the Battery Foreman's Report daily and compile a list of defective offtake system apparatus. Repair or replacement is to be scheduled and performed as soon as practicable.

B. Identifying / Sealing of Leaking Offtake System Components

1. The Larryman is to visually inspect offtake system of each oven charged after removal of aspiration steam.

2. Visible leakage is to be subject to an immediate attempt by the Larryman to reseal.

3. Any offtake system emission that cannot be stopped by sealing is to be reported by the Larryman to the Oven Turn Foreman immediately and logged on the Battery Foreman's Report by shift end. The Report is to be submitted to the Battery General Foreman for the scheduling and performance of repair as soon as practicable.

C. Dampering Off of Ovens Prior to a Push

1. The Larryman is to damper off the oven to be pushed.

2. The Larryman is to open the standpipe cap.

D. Evaluations of Effectiveness of Inspection and Repair System
Following the effective date of this Work Practices Plan (printed on cover page), the Plant Superintendent is to initiate the following evaluation of the offtake emissions program:

1. Evaluation of Offtake System Inspection Procedures
   a. The Plant Superintendent is to designate an individual to conduct an evaluation of the procedures used by the Larryman who is responsible for the inspection of offtake systems.

   b. The evaluator is to use a check list and randomly evaluate for at least one offtake system inspection.

c. The evaluator is to report his findings to the Plant Superintendent in writing. If the evaluator reports significant deviation from the prescribed inspection procedures, the plant Superintendent is to direct the Oven Turn Foreman to provide supplemental refresher training to the appropriate personnel. The supplemental refresher training is to include a review of the written job procedures for inspection, on-the-job training, or other training deemed to be required by the Plant Superintendent.

d. The Oven Turn Foreman is to complete the supplemental training within 4 days and submit a report to the Plant Superintendent when the supplemental training has been completed.

e. Recording and Certification of Offtake System Inspection evaluations
The following reports are to be kept as part of the evaluation records.

1) Evaluator's's Report
2) Plant Superintendent's Corrective Action Report directing any supplemental training to be conducted.
3) The Oven Turn Foreman's Report certifying that the supplemental training required has been completed.

2. Evaluation of Offtake Repair System Program

a. The Plant Superintendent is to designate an individual experienced in offtake system repair to conduct a repair evaluation of at least one of the following that has been repaired to confirm that the repair meets the specifications required:

1) Standpipes
2) Standpipe Caps
3) Goosenecks
4) Dampers and Mains
5) Oven Roofs
6) Charging Holes
7) Charging Lids
8) Steam System
9) Liquor System

b. The evaluator is to report his finds to the Plant Superintendent in writing. If the evaluator reports a significant deviation from the prescribed specifications, the Plant Superintendent is to direct the Battery General Foreman or Maintenance Foreman to provide supplemental refresher training to the appropriate personnel.

c. The Battery General Foreman or Maintenance Foreman is to complete the supplemental training within 4 days and submit a report to the Plant Superintendent when the supplemental training has been completed

d. Recording and Certification of Offtake System Repair / Replacement evaluation
The following reports are to be kept as part of the evaluation records:

1) Evaluator's Report
2) Plant Superintendent's Corrective Action Report directing any supplemental training to be conducted.

3) The Battery General Foreman's or Maintenance Foreman's Report certifying that the supplemental training has been completed.

7. Work practice plan for fugitive pushing emissions 40 CFR 63.7291

The Method 9 certifier reader shall observe and record fugitive pushing emissions from each oven at least every 90 days.

Do not push the oven unless the visual inspection indicates that there is no smoke in the open space above the coke bed and there is an unobstructed view of the door on the opposite side of the oven.

The requirements of this section 7 are in addition to the requirements set forth in Section 9.3.1.

8. Operation and Maintenance Plan CFR 63.7280

O&M; Startup, Shutdown & Malfunctions Plan, See Appendix C

9. PROCEDURES FOR MAINTAINING RECORDS OF PERFORMANCE, 40 CFR 63.306 (B) (7) (I) (II) SUBPART L. and DEMONSTRATING COMPLIANCE, 40 CFR 63.7333-7335

9.1 BOILERS – Records of Performance

9.1.1 Annual Tune-up
The boiler house manager shall record each annual adjustment or tune-up on the combustion process in a permanently bound log book. This log shall contain, at a minimum, the following:

1. The date of the tuning procedure
2. The name of the service company and technicians
3. The final operating rate or load
4. The final CO and NOx emission rates
5. The final excess oxygen rate

9.1.2 NOx Emission Records
Staff shall maintain on site the total nitrogen oxide (NOx) emissions of each boiler on a monthly basis and the corresponding quarterly (3-month) rolling totals and 12-month rolling totals.

9.1.3 Records of SOx Calculations
Staff shall calculate the SOx emissions whenever the sulfur content of the coke oven gas exceeds 3% by weight to show compliance with 25 Pa. Code §123.22

9.1.4 Records of H2S Testing

Staff shall test, monthly, the coke oven gas for hydrogen sulfide content as prescribed in 25 Pa. Code Chapter 139 and maintain records of the testing.

9.1.5 Boiler Additional Recordkeeping Requirements

The Environmental Manager will ensure that requirements are met, as set forth in Title V Permit No. 25-00029, Section E, Group Names:

- 1 - BOILERS (#007; #008; #009)
- 2 - NESHAP FOR BOILERS (#002; #003; #004)

9.2 COKE OVENS, COKE-SIDE SHED & QUENCH – Records of Compliance with Emission Limits, 40CFR63.7333

The Plant Environmental Manager will have responsibility for maintaining Records of Compliance, as set forth below.

9.2.1 Compliance with particulate matter (PM) limitations: Conduct performance tests no less frequently than twice during Title V operating permit. 40 CFR 63.7290 (a). Provide notice and test plans to regulators as required in permit. Maintain records as required in permit.

9.2.2 Compliance with shed collection system: Maintain the daily average motor amperes at or above the minimum level of 261.1as established during the initial performance test. 40 CFR 63.7290 (b)(3)(i) Check and record amperage at least once every 8 hours to ensure the daily average level is met or exceeded.

9.2.3 Compliance with battery stack opacity limitations: maintain the daily average at or below 15% for a battery on normal coking cycle or 20% for a battery on battery-wide extended coking. Operate and maintain the COMS, and record and maintain COMS data according to 63.7331(j). 40 CFR 63.7333(e)(1)(2).

9.2.4 Compliance with the total dissolved solids (TDS) limit for quenching: Determine the TDS of the quench water at least weekly and maintain levels at or below 1,100 mg/L. The Environmental Manager or designated technician will collect and analyze a quench water sample as per 63.7325(a)(1)(2) They will maintain records of completion.

9.2.5 Compliance with the constituent limit for quench water: Determine the constituent concentrations, including benzene, benzo(a)pyrene and naphthalene of the quench water at least monthly and maintain levels at or below permit limits. They will maintain records of completion.

9.3 WORK PRACTICE STANDARDS - Records of Compliance with Work Practice Standards 40CFR63.7334

The Plant Environmental Manager will have responsibility for maintaining Records of Compliance, as set forth below.

9.3.1 Fugitive Opacity Emissions. 63.7334(a)

9.3.1.1 Observe and record fugitive emissions for four consecutive pushes per operating day. Maintain records of the pushing schedule for each oven in accordance with Method 9, Appendix A, 40CFR60.

9.3.1.2 Observe and record fugitive emissions for each oven in the battery at least once every 90 days in accordance with Method 9, Appendix A, 40CFR60. Maintain records demonstrating that each oven has been observed, and recording the observed emissions for each oven.

9.3.1.3 Use the average of the total number of observations to calculate the average opacity for the push.

9.3.1.4 Begin observations at the first detectable movement of the coke mass and end when the quench car enters the quench tower.

9.3.1.5 Take corrective action for any battery that exceeds opacity of 30% (short oven) such as increasing coking time in accordance with 63.7291(a). Maintain records documenting the corrective action.

9.3.2 Soaking. 63.7334(d)

9.3.2.1 Conduct/refresh and document training of topside workers to identify soaking emissions that require corrective action.

9.3.2.2 Damper the oven off the collector main prior to opening the standpipe cap.

9.3.2.3 If any soaking emissions do not ignite automatically, determine the cause and take immediate corrective action if the matter is susceptible to such action. If the matter is not susceptible to immediate correction, the General Forman will notify the battery formem who immediately shall record the matter in the Supervisor office by shift-end, so that corrective action may be immediately scheduled and performed as soon as practicable, At least within 14 days.

9.3.2.4 If soaking emissions are caused by leaks from the collecting main, the Battery Forman will take corrective actions to eliminate the soaking emissions. The issue and response are to be described in the [Battery Foreman's] Report.

9.3.2.5 If soaking emissions are not caused by leaks from the collecting main, notify the designated responsible party (Battrey Forman), who shall take immediate corrective action if the matter is susceptible to such action or shall inform the General Forman who shall record the matter in the Supervisor's office by shift-end so that corrective action may be immediately scheduled and completed as soon as practicable.

9.3.2.6 If incomplete coking is the cause of the soaking emissions, put the oven back on the collecting main until it is completely coked or ignite the emissions.

9.3.3 Quenching. 63.7334(e)

9.3.3.1 Maintain the baffles in quench tower such that no more than five percent of the cross sectional area of the tower is uncovered or open to the sky. Inspect the quench tower monthly for damaged or missing baffles and blockages; initiate repairs within 30 days, and complete as soon as practicable. Document inspection, repair initiation, and repair completion; maintain records.

9.3.3.2 Maintain and document conformance with the washing, inspection and repair requirements in 63.7295(b)(2). Specifically, wash the baffles once each day that the towner is used to quench coke, unless the highest measured ambient temperature for the day remains less than 30 degrees. On days when baffles are not washed, record the ambient air temperature continuously and record with the quench tower data. 9.3.3.3 Maintain records of the source of makeup water to document conformance with the requirement of acceptable makeup water in 63.7295(a)(2).

9.4 OPERATION AND MAINTENANCE - Records of Compliance with O&M Standards 40CFR63.7335

9.4.1 Operating Parameters. 63.7300(b)(1-6).

Sections 3.4.1 through 3.4.6 of the ECC O&M Plan, found in Appendix C, identify operating parameters to achieve good air pollution control practices and the frequency and procedures for monitoring, recording and minimizing pushing, quenching, and battery stack emissions.

9.4.2 Capture and Control Devices. 63.7300(c)

Section 3.4.7 of the ECC O&M Plan identifies the actions and recordkeeping necessary for the inspection, preventative maintenance and corrective actions for the Capture and Control Devices for pushing, quenching and battery stack emissions.

APPENDIX A

Name of Employee: _____ Clock Number: _____
(Trainee Print Name)

Job Title: Backman
[ ] Explained related Work Instruction to Backman.

Principal Responsibilities

[ ] Explained and demonstrated the procedure for removing the coke side door.

[ ] Explained and demonstrated the procedure for cleaning the doorjambs.

[ ] Explained and demonstrated where the scrap is placed on the clay car for reuse.

[ ] Explained and demonstrated positioning of the coke guide and setting of the parking brake.

[ ] Explained and demonstrated the use of the horn and intercom system.

[ ] Explained and demonstrated the proper use of the deadman switch.

[ ] Explained and demonstrated the luting of the doors.

[ ] Explained and demonstrated procedure for visually checking the damper handle prior to pulling the door.

Quality Impact

[ ] Explained how the proper luting of the doors contributes to optimum operating efficiency and control of the airborne emissions.

Tools and Equipment

[ ] Explained the purpose and proper use of: [ ] Back door machine, [ ] Luting Equipment, [ ] Airgun, [ ] Bars, [ ] Clay Car, [ ] Door Jambs

Material

[ ] Explained what coke is.

Additional Comments:
_____
_____
_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____ **Hours** _____

I have been trained in the Backman position and can effectively perform the job.

_____ _____

(Employee Signature) (Date)

(Clock #)

Completed By: _____ Title: _____

Date: _____

(Trainer)

Supervisor Signature: _____ Title: _____

Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this job).

Name of Employee: _____

Clock Number: _____

(Trainee Print Name)

Job Title: Coal Loader
[ ] Reviewed and explained related Job Description and Work Instructions to Coal Loader.

Principal Responsibilities: To operate front-end loader for the transportation of raw materials to and from designated
storage lots. To transport raw materials from designated lots to the coal hopper for introduction into the coal handling system.

Quality Impact:
The proper transport of raw materials to and from designated lot locations ensures proper coal is added into the hopper for the calculated coal mix. This ensures traceability of out-of-spec raw materials.
Following (FIFO) first in - first out ensures proper rotation and reclamation of the raw material minimizing risk of oxidation
by using the oldest coal first.

Coal Loader Duties:

[ ] Explained and demonstrated the proper method to perform the required daily inspection of the front-end loader,
including all paperwork.
[ ] Explained and demonstrated the safe and proper method for scraping and back dragging coal in storage.
[ ] Explained that when scraping or moving coal, if the operator digs to deep with the loader bucket it can result
in contamination of the coal.
[ ] Explained and demonstrated the safe and proper method for the startup of #1Elevator.
[ ] Explained and demonstrated the safe and proper method for the startup for the Hammermill and related conveyor system.
[ ] Explained and demonstrated the safe and proper method for adjusting screens on the Hammermill.
[ ] Explained and demonstrated how to inspect the Hammermill, coal storage, all outside belts and drives, and recording
the results on the Coal Handling Inspection Report.
[ ] Explained and demonstrated the daily cleanup responsibilities of the Coal Loader.

Tools and Equipment:
Front-end Loader, Coal Handling System and assorted hand tools.

Material:

Coal and Breeze
[ ] Explained the procedure for the proper storage and identification of stocked coal and breeze.

Safety:
[ ] Explained required attendance at mandatory monthly safety meetings.
[ ] Explained safety issues related to Front-end Loaders.
[ ] Explained safety issues related to working with the Coal Handling System equipment.
[ ] Explained and demonstrated the use of the emergency pull stops for conveyor systems.

[ ] Showed the location and proper operation of disconnects for related equipment in the Coal Handling System.
[ ] Explained and demonstrated Lockout-Tag Out Procedures for equipment repair or if necessary while performing cleanup.
[ ] Explained and demonstrated proper use of PPE required for daily activities (respirators and earplugs must be worn in
regulated areas).
[ ] Explained housekeeping responsibilities and its relationship to safety and quality.

Additional Comments:

_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____
Hours_____

I have been trained for the position of Coal Loader and can effectively perform the job.

_____ _____
_____
(Employee Signature) (Clock #)
(Date)

Completed By: _____ Title: _____ Date: _____
(Trainer)
Supervisor: _____ Title: _____ Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____

Clock Number: _____

(Trainee Print Name)

Job Title: Coal Operator
[ ] Reviewed and explained related Job Description and Work Instructions to Coal Operator.

Principal Responsibilities: To direct the loading and unloading of coals to the mixing bins. To inspect and operate the coal
blending system.

Quality Impact: Monitors the pulverization process to ensure proper size distribution. Segregates each coal into its corresponding bin thus avoiding raw material contamination. Regulates the addition of Bulk Density oil into the mix to
achieve proper density.

Coal Operator Duties:

[ ] Explained and demonstrated coal lot identification system through the use of the Coal Map.
[ ] Explained and demonstrated the safe and proper operation of machinery and equipment for the Coal Handling System.
[ ] Explained and demonstrated how to complete and forward the Coal Handling Inspection Report.
[ ] Explained and demonstrated how to direct the loading of coals into the designated mixing bin to ensure proper blending.
[ ] Explained and demonstrated the proper method to weigh the coal mix.
[ ] Explained and demonstrated how to adjust and monitor gate settings to ensure proper percentages (referencing the
Coal Mix Report).
[ ] Explained and demonstrated the proper technique for coal sampling and testing for pulverization and bulk density.
[ ] Explained and demonstrated how to make adjustments to the Hammermill and Bulk Density Oil System to
achieve required results.
[ ] Explained and demonstrated the safe and proper method for adjusting screens on the Hammermill.
[ ] Explained and demonstrated how to complete and forward the Coal Handling Report.
[ ] Explained and demonstrated the daily cleanup responsibilities of the Coal Operator.

Tools and Equipment:
Coal Handling System, schuttle belt, mixing belts, conveyors and assorted hand tools.

Material:

Coal, Coke Breeze, and Bulk Density Oil.
[ ] Explained the procedure for the proper storage and identification of stocked coal and breeze.

Safety:
[ ] Explained required attendance at mandatory monthly safety meetings.
[ ] Explained safety issues related to working with the Coal Handling System equipment.
[ ] Explained and demonstrated the use of the emergency pull stops for conveyor systems.
[ ] Showed the location and proper operation of disconnects for related equipment in the Coal Handling System.

[ ] Explained and demonstrated Lockout-Tag Out Procedures for equipment repair or if necessary while performing cleanup.
[ ] Explained and demonstrated proper use of PPE required for daily activities (respirators and earplugs must be worn in
regulated areas).
[ ] Explained housekeeping responsibilities and its relationship to safety and quality.

Additional Comments:

_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____
Hours_____

I have been trained for the position of Coal Operator and can effectively perform the job.

_____ _____
_____
(Employee Signature) (Clock #)
(Date)

Completed By: _____ Title: _____ Date:
_____
(Trainer)

Supervisor: _____ Title: _____ Date:
_____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ Clock Number: _____

(Trainee Print Name)

Job Title: Coke Handling Operator
[ ] Reviewed and explained related Job Description and Work Instructions to Coke Handling Operator.

Principal Responsibilities:
The operation of the coke handling system for the loading of railcars or trucks with finished product.
To complete the documentation required of the Coke Handling Operator.

Quality Impact:
Through the proper screening and loading of coke product, customer-specific size requirements may be consistently satisfied.

Coke Handling Operator Duties:

[ ] Explained and demonstrated the proper method to perform coke handling inspection and complete
Coke Handling Inspection Report (Inspection must be preformed at the start of each shift).
[ ] Explained the importance of Gyrex Screens and that if needed repairs or replacement must be performed
before start-up to ensure proper screening and to avoid contamination.
[ ] Explained and demonstrated the safe and proper start-up and shut down operation of coke handling system.
[ ] Explained the buzzer and intercom system for operator to communicate with the wharfman.
[ ] Explained the purpose of Product Illustrations and their location.
[ ] Explained how to identify and handling procedures for nonconforming product.
[ ] Explained the purpose of railcar inspection and tagging railcar system for coke size.
[ ] Explained and demonstrated how to properly load railcar or truck and the proper height of coke loaded into a
railcar.
[ ] Explained and demonstrated related tasks of the coke operator before and after the switching of railcars.
[ ] Explained and demonstrated how to properly complete the Coke Loading Report.
[ ] Explained the buzzer and light system used to communicate with truck drivers while loading a truck.
[ ] Explained the Bill of Lading for loading trucks, the inspection of all trailers and location for trailer clean-out.
[ ] Explained the proper method for loading coke into railcars or trucks to ensure correct size is loaded.
[ ] Explained and demonstrated how to switch the system over from sizing for 6x9 to sizing for 4x9.
[ ] Explained and demonstrated how to monitor the quality of finished product being loaded into railcars or trucks.
[ ] Explained and demonstrated how to perform a proper Dock Audit inspection.
[ ] Explained the Special Attention Notice to the truck loader.
[ ] Explained the importance of ensuring that coke on the wharf is properly quenched and cooled before operating
the coke loading system.
[ ] Explained and demonstrated the proper use of boom sprays if needed, for cooling hot pieces of coke.

[ ] Explained the importance of not over saturating coke.
[ ] Explained the importance of clearing all belts of the coke handling system before shutting the system off.
[ ] Explained that during extremely cold weather the coke loading system must be left on to ensure operation.
[ ] Explained and demonstrated the safe and proper operation of car-pullers, load restrictions for summer and
winter, and the inspection of car-pullers and cables
[ ] Explained the house keeping responsibilities of the Coke Operator as detailed in the work instruction with a
emphasis on the proper placement of the cleanup to ensure proper screening and to avoid contamination.

Tools and Equipment:
Coke Handling Loading System, Car-Pullers, and various hand tools.

Material:

Coke and Coke Breeze

Safety:
[ ] Explained safety issues for all the equipment associated with the coke loading system.
[ ] Explained safety issues related to working with car-pullers and railcars.
[ ] Explained and demonstrated the proper use of the hand tools needed to perform various tasks in coke handling.
[ ] Explained and demonstrated lockout-tag out procedures for equipment repair or if necessary while performing
cleanup.
[ ] Explained and demonstrated the use of emergency pull stop switches for conveyor systems in coke handling.
[ ] Explained and demonstrated proper use of PPE required for daily activities.
[ ] Explained housekeeping responsibilities and its relationship to safety and quality.

Additional Comments:
_____
_____
_____
_____
_____
_____

Length of training period: **Weeks**_____ **Days** _____
Hrs. _____

I have been trained for the position of Coke Handling Operator and can effectively perform the job.

_____ _____
_____
(Employee Signature) (Clock #)
(Date)

Completed By: _____ Title: _____ Date: _____
(Trainer)

Supervisor: _____ Title: _____ Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ Clock Number: _____

(Trainee Print Name)

Job Title: Heater

[ ] Explained related Job Description and Work Instruction to Heater.

Principal Responsibilities

[ ] Explained and demonstrated the proper procedures for reading and recording oven temperatures.

[ ] Explained and demonstrated the procedure for cleaning out gas orifices, pins, washers and related piping.

[ ] Explained and demonstrated the procedure for changing charts.

[ ] Explained and demonstrated the proper procedure for steaming gas lines and draining drips.

[ ] Explained and demonstrated procedures for setting up oven for dust and reverse before charging.

Quality Impact

[ ] Explained employees contribution to coking and pushing process and to the long term efficiency of the battery heating system.

Tools and Equipment

[ ] All battery instrumentation, optical pyrometer, tape recorder, hand tools, flashlight, heat pads, brushes and other tools.

Material

[ ] Coke oven gas, combustion air and charts.

Additional Comments:

_____

_____

_____

_____

Length of training period: **Weeks _____ Days _____ Hours _____**

I have been trained in the Heater position and can effectively perform the job.

_____ _____

_____

(Employee Signature) (Date)

(Clock #)

Completed By: _____ Title: _____
Date: _____
(Trainer)

Supervisor: _____ Title: _____

Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ **Clock Number:** _____

(Trainee Print Name)

Job Title: Larryman

[ ] Explained related Work Instruction to Larryman.

Principal Responsibility

[ ] Explained and demonstrated the procedure for loading the Larry car from battery bins.
[ ] Explained and demonstrated the procedure of shutting off dampers to ovens that are to be pushed or
charged.
[ ] Explained and demonstrated procedures for charging ovens according to prescribed guidelines and
environmental regulations.
[ ] Explained and demonstrated how to clean charging lids and rings.
[ ] Explained and demonstrated how to seal charging lids.
[ ] Explained and demonstrated the emergency shutoff for the Larry bin jaws.
[ ] Explained how and when to read the steam charts on top of the battery.
[ ] Explained how and when to rod out the Corliss.
[ ] Explained how and when to empty the spillage hopper.
[ ] Explained how and when to fill out the Larry Car Report.

Quality Impact

[ ] Explained appropriate Larry car loading and oven charging practices, which contribute to the process control
methods that result in the production of consistent and quality coke product.

Tools & Equipment

[ ] Explained the purpose and use of: [ ] Larry car, [ ] Lid Hooks, [ ] Chipping Guns, [ ] Shovels, [ ] Brooms,
[ ] Related hand tools, [ ] Corliss Bar, [ ] Other:
_____

Material

[ ] Explained coal blends; sealants

Additional Comments:

_____
_____
_____
_____
_____
_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____ **Hours** _____

I have been trained in the Larryman position and can effectively perform the job.

_____ _____

_____
(Employee Signature)

(Date) (Clock #)

Completed By: _____ Title: _____ Date: _____

(Trainer)

Supervisor: _____ Title: _____ Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ Clock Number: _____

(Trainee Print Name)

Job Title: Patcher

[ ] Explained related Job Description to Patcher.

Principal Responsibilities

[ ] Explained proper spraying and patching of oven walls as well as mixing and proper preparation of materials.
[ ] Explained and demonstrated proper procedure for replacement of damper valves, standpipes and goosenecks.
[ ] Explained and demonstrated proper procedure for replacing door, standpipe and gooseneck refractory.
[ ] Explained and demonstrated proper procedures for end flue repairs.
[ ] Explained importance of method 303 inspection compliance.

Quality Impact

[ ] Explained the contribution to the coking and pushing process, and to the long-term efficiency of the ovens and related brick work.

Tools and Equipment

[ ] Explained and demonstrated the proper use of: [ ] Jackhammers [ ] Trowels [ ] Chisel Bars [ ] Sprayer [ ] Brick saw [ ] Mixers [ ] and related hand tools [ ] Other: _____

Material

[ ] Explained the following materials: [ ] Refractory cements [ ] Sealant [ ] Ceramic rope [ ] Various types of brick [ ] Other: _____

Safety

[ ] Explained importance of protective equipment while patching and spraying.

Additional Comments:

_____
_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____ **Hours** _____

I have been trained in the Patcher position and can effectively perform the job.

_____ _____

_____
(Employee Signature) (Date)

(Clock #)

Completed By: _____ Title: _____

Date: _____

(Trainer)

Supervisor: _____ Title: _____

Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ Clock Number: _____

(Trainee Print Name)

Job Title: Pusherman

[ ] Explained related Work Instruction to Pusherman.

Principal Responsibilities

[ ] Explained and demonstrated how to remove and clean pusher side door jams.

[ ] Explained and demonstrated how to operate the ram and leveling bar.

[ ] Explained and demonstrated how to make mud and lute oven and chuck doors.

Quality Impact

[ ] Explained the proper procedures for filling the ovens, leveling and pushing. Explained how these
practices contribute to the production of quality coke by effecting the size and strength variables.

[ ] Explained to the new employee that documenting push amperages and difficult pushes alert relevant
personnel to inspect factors that may adversely alter the efficiency and control of the coking process.

Tools and Equipment

[ ] Explained the purpose and use of: [ ] Pusher, [ ] Scraper, [ ] Pry-Bar, [ ] Shovel, [ ] Broom, [ ]
Wheelbarrow, [ ] Luting Equipment, [ ] Related hand tools [ ] Other: _____

_____
_____

Material

[ ] Explained coal, coke product and sealants.

Additional Comments:

_____
_____
_____
_____

Length of training period: **Weeks _____** **Days _____**
Hours_____

I have been trained in the Pusherman position and can effectively perform the job.

_____ _____

_____
(Employee Signature) (Date)
(Clock #)

Completed By: _____ Title: _____
Date: _____
(Trainer)

Supervisor Signature: _____ Title: _____

Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this job).

Distribution: NA **Page 89 of 127**
ETRPUSH6.2.2
Revision Date: 4-13-04

Name of Employee: _____ Clock Number: _____

(Trainee Print Name)

Job Title: Quench Car Operator

[ ] Explained related Work Instruction to Quench Car Operator.

Principal Responsibilities

[ ] Explained and demonstrated how to safely operate the Quench car.

[ ] Explained and demonstrated cleaning of the coke side doors, when assisting the backman.

[ ] Explained and demonstrated how to align the coke guide with the oven to be pushed.

[ ] Explained and demonstrated movement of the Quench car to properly catch the oven.

[ ] Explained and demonstrated procedure for introducing coke into the wharf system.

[ ] Explained and demonstrated procedure for making mud.

[ ] Explained and demonstrated procedure for filling diesel tanks.

[ ] Explained and demonstrated the procedure for draining and refilling the scrubber tank (is done

once per shift) and for adding water when minimum H2O light comes on.

[ ] Explained and demonstrated the procedure for turning on the scrubber/sprays during push and knew the

importance of this procedure.

Quality Impact

[ ] Explained contribution to the attainment of the operating efficiency.

Tools and Equipment

Explained the purpose and use of: [ ] Quench car, [ ] Intercom/Whistle System, [ ] Door cleaning tools, [ ] Mudmill, [ ] Diesel tank, [ ] Scrubber tank

Material

[ ] Explained what coke is.

Additional Comments:

_____
_____
_____
_____

Length of training period: **Weeks** _____ **Days** _____
Hours_____

I have been trained in the Quench car position and can effectively perform the job.

_____ _____
_____
(Employee Signature) (Date)
(Clock #)

Completed By: _____ Title: _____
Date: _____
(Trainer)

Supervisor Signature: _____ Title:
_____ Date: _____

(By signing this form I have observed the above-mentioned employee effectively perform this position).

Name of Employee: _____ **Clock Number:** _____
(Trainee Print Name)

Job Title: Wharfman
[ ] Explained Work Instruction to Wharfman.

Principal Responsibility
[ ] Explained and demonstrated the procedure of wetting coke hot spots.

[ ] Explained and demonstrated the procedure of moving coke off the wharf and into the coke handling system at a steady even pace.

[ ] Explained and demonstrated how to clean the galley (top to bottom).

[ ] Explained and demonstrated running of the north hopper.

Quality Impact:
[ ] Explained contribution to the attainment of optimum operating efficiency and control of the proper introduction of coke into the coke handling system.

[ ] Explained nonconforming product.

Tools & Equipment:
[ ] Explained the proper use and purpose of: [ ] Conveyor systems, [ ] Wharf gates, [ ] Water - hose, [ ] Sledge hammers, [ ] Intercom and horn system, [ ] North Hopper, [ ] Other:
_____

Material
[ ] Explained what coke is.

Additional Comments: _____
_____

Length of training period: **Weeks**_____ **Days** _____
Hours_____

I have been trained in the Wharfman position and can effectively perform the job.

_____ _____ _____
(Employee Signature) (Date) (Clock #)

Completed By: _____ Title: _____ Date: _____
(Trainer)
Supervisor Signature: _____ Title: _____ Date: _____
(By signing this form I have observed the above-mentioned employee effectively perform this position).

APPENDIX B

Erie Coke Corporation

Heating Report

Battery: A

Date: _____

Gas Pressure:					**Stack Draft:**			
Flue Temperatures					**Heater Information**	**Crosswall Temperatures**		
Wall #	**Outer Zone #1 Flue #5**	**Inner Zone #2 Flue #10**	**Inner Zone #3 Flue #10**	**Outer Zone #4 Flue #5**		**Flue #**	**Wall Numbers**	
1					**Taken By:**	**1**		
2						**2**		
3						**3**		
4						**4**		
5					**Shift:**	**5**		
6						**6**		
7						**7**		
8					**Pusher Side Avg.**	**8**		
9						**9**		
10						**10**		
11					**Coke Side Avg.**	**11**		
12						**12**		
13						**13**		
14					**Shift Avg.**	**14**		
15						**15**		
16						**16**		
17						**13**		
18						**12**		
19						**11**		
20						**10**		
21						**9**		
22						**8**		
23						**7**		
24						**6**		
Avg.						**5**		
						4		
						3		
						2		
						1		

Distribution: Main Office and Battery
HEATRPTA7.5

Revision Date: 1-31-04

Erie Coke Corporation

Heating Report

Battery: B

Date: _____

Gas Pressure:					Stack Draft:			
Flue Temperatures					Heater Information	Crosswall Temperatures		
Wall #	Outer Zone #1 Flue #5	Inner Zone #2 Flue #10	Inner Zone #3 Flue #10	Outer Zone #4 Flue #5		Flue #	Wall Numbers	
24					Taken By:	1		
25						2		
26						3		
27						4		
28					Shift:	5		
29						6		
30						7		
31					Pusher Side Avg.	8		
32						9		
33						10		
34					Coke Side Avg.	11		
35						12		
36						13		
37					Shift Avg.	14		
38						15		
39						16		
40						13		
41						12		
42						11		
43						10		
44						9		
45						8		
46						7		
47						6		
48						5		
49						4		
50						3		
51						2		
52						1		
53								
54								
55								
56								
57								
58								
59								
Avg.								

Distribution: Main Office and Battery
HEATRPTB7.5

Revision Date: 1-31-04

ECC Battery Inspection and Cleaning Schedule

"A" Battery Cleaning Procedure
1. Swab emergency cock.
2. Swab through gas cock (reversing cock), check for hard deposits that swab didn't remove, chip these out, make sure opening in cock is right size.
3. Swab flex line to gun head, make sure line has no restrictions.
"B" Battery Cleaning Procedure
1. Swab emergency cock.
2. Open and clean flex lines.
3. Clean T and horizontal piping under gas cocks.
4. Swab gas cocks and offsets, making sure of a full opening in the gas cocks.
5. Using air, blow out inner and outer zone gas manifolds, use air turbine to maintain full diameter.
6. Clean 3/4" lines, pins, and orifices.
7. Inspect and clean rizers pipes, making sure they are fully opened to the proper size.

"B" Battery Maintenance is given 2 days: One day for outer wall and one day for inner wall.

A-	Walls 1-6	Walls 24-32
B-	Walls 7-12	Walls 51-59
C-	Walls 19-24	Walls 33-41
D-	Walls 13-18	Walls 42-50

Week of:

	S	M	T	W	T	F	S	Initials	Date
A	1-24	2-24	3-25	4-25	5-26	0	0		
B	7-51	0	0	8-51	9-52	10-52	11-53		
C	19-33	20-33	21-34	0	0	22-34	23-35		
D	0	13-42	J14-42	15-43	16-43	17-44	18-44		

Week of:

	S	M	T	W	T	F	S	Initials	Date
A	0	0	6-26	1-27	2-27	3-28	4-28		
B	12-53	7-54	8-54	0	0	9-55	10-55		
C	24-35	19-36	20-36	21-37	22-37	0	0		
D	13-45	J14-45	0	15-46	16-46	17-47	18-47		

Week of:

	S	M	T	W	T	F	S	Initials	Date
A	5-29	J6-29	0	1-30	2-30	3-31	4-31		
B	11-56	12-56	7-57	8-57	9-58	0	0		
C	0	0	23-38	24-38	19-39	20-39	21-40		
D	13-48	14-48	15-49	0	0	16-49	17-50		

Week of:

	S	M	T	W	T	F	S	Initials	Date
A	5-32	6-32	1-33	0	0	2-33	3-34		
B	0	0	10-58	11-59	12-59	7-51	8-51		

C	22-40	J23-41	0	24-41	19-42	20-42	21-43		
D	18-50	13-51	14-51	15-52	16-52	0	0		

Distribution: Main Office and Battery Department
BIS7.5
Revision Date: 12-31-03 **Remarks**
on back of page

ECC Coke Handling Inspection Report

Date:				**Inspector's initials per shift**		
Equipment needed to be inspected	Mark with **X for** Inspection					
				Remarks (Problems or Comments)		
#1 Gyrex						
#2 Gyrex						
#4 Gyrex						
#5 Gyrex						
Boom Sprays						
Conveyor System (wharf to boom)						
Car pullers and cables for each line						

Drained filters for Boom Sprays (once per shift)				
Foreman's initials per shift:				

***Inspection must be completed at the start of each shift. Operators must initial all comments and remarks.**

*** Forward the completed inspection to the maintenance supervisor daily. If there is a problem contact your Supervisor <u>immediately</u>.**

Distribution: Main Office and Coke Handling

COKHIR7.5

Revision Date: 6-26-13

ECC Coke Loading Report **Date**

Initialed Remarks: Corrective Action taken for unclean cars/trucks or contaminated loads or nonconforming material. **NOTE: DO NOT LOAD ANY SHIPPER CARS WITH EXTRA BEAMS ACROSS THE POCKET. CONTACT YOUR SUPERVISOR.**							**Clean Car/Truck** **Initial**	**Clean Belt** **Initial**
Car/Truck # 1x2	Shift	Customer or Lot Number	Size	Time In and Out	North Hopper or **Rework being run**	**Dock Audit Performed**		
2 x 4								
4 x 6 and 4 x 9								
6 x 9								

Distribution: Main Office and Coke Handling Department
CLR8.2.4
Revision Date: 10-30-08

Date:_____

	Shift 12A to 8A			Shift 8A to 4P			Shift 4P to 12A		
	Oven #	**Fdy (F) or Indy (I)**	**North (N) Center (C) South (S)**	**Oven #**	**Fdy (F) or Indy (I)**	**North (N) Center (C) South (S)**	**Oven #**	**Fdy (F) or Indy (I)**	**North (N) Center (C) South (S)**
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
	GF: **LM:**			**GF:** **LM:**			**GF:** **LM:**		

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LARRYRPT7.5
Revision Date: 3-1-08

APPENDIX C

WORK PRACTICES PLAN FOR SOAKING

APRIL, 2019

Prepared by:

Erie Coke Corporation

Box 6180
Erie, PA 16512-6180

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1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) has been provided the authority to develop and implement maximum achievable control technology (MACT) standards for source categories that emit any listed hazardous air pollutants (HAPs) under the Clean Air Act. In 1993, as part of the process of implementing such authority, the USEPA promulgated coke oven MACT National Emission Standards for Hazardous Air Pollutants (NESHAP) in 40 C.F.R. Part 63,Subpart CCCCC, § 63.7280 et seq. (Coke Oven MACT).

2.0 COKE OVEN MACT REQUIREMENTS FOR SOAKING

Soaking is defined in 40 C.F.R. § 63.7352 as "that period in the coking cycle that starts when an oven is dampered off the collecting main and vented to the atmosphere through an open standpipe prior to pushing and ends when the coke begins to be pushed from the oven." Similarly, "Soaking emissions" are defined in 40 C.F.R. § 63.7352 as "the discharge from an open standpipe during soaking of visible emissions due to either incomplete coking or leakage into the standpipe from the collecting main."

The purpose of the work practices plan requirement is to minimize the potential for fugitive emissions during the soaking period. Soaking emissions are most pronounced prior to a potential "green" push. Thus, limiting the potential cause of "green" pushes is also a key consideration. For purposes of this work practices plan, users are to be aware of the regulatory definition of soaking and soaking emissions, and the purpose of the work practices plan requirement.

The requirements for soaking are codified in 40 C.F.R. § 63.7294(a), and include the following:

a. For each new and existing by-product coke oven battery, you must prepare and operate at all times according to a written work practice plan for soaking. Each plan must include measures and procedures to:

1. Train topside workers to identify soaking emissions that require corrective actions.

2. Damper the oven off the collecting main prior to opening the standpipe cap.

3. Determine the cause of soaking emissions that do not ignite automatically, including emissions that result from raw coke oven gas leaking from the collecting main through the damper, and emissions that result from incomplete coking.

4. If soaking emissions are caused by leaks from the collecting main, take corrective actions to eliminate the soaking emissions. Corrective actions may include, but are not limited to, reseating the damper, cleaning the flushing liquor piping, using aspiration, putting the oven back on the collecting main, or igniting the emissions.

5. If soaking emissions are not caused by leaks from the collecting main, notify a designated responsible party. The responsible party must determine whether the soaking emissions are due to incomplete coking. If incomplete coking is the cause of the soaking emissions, you must put the oven back on the collecting main until it is completely coked or you must ignite the emissions.

ECC's actions to meet each specific requirement is discussed in more detail below.

2.1 TRAINING OF TOPSIDE WORKERS

40 C.F.R. § 63.7294(a)(l) requires all topside workers to be trained to identify soaking emissions that require corrective actions. ECC already provides its topside battery operators with detailed training as it pertains to safety and job-related requirements upon their hiring, and on a regular ongoing basis thereafter. This training will be enhanced to encompass the requirements of this work practice plan, and other related environmental compliance items.

Attendance at each training session will be documented, along with the operator meeting the necessary proficiency requirements of the training, with all applicable records to be retained in the office of the Human Resources manager. Applicable staff supervisors overseeing each training will individually sign-off on each training session.

General training for topside battery operators is estimated to take approximately 80 hours over the course of the initial training program, including the requirements of this work practice plan. General refresher training is provided to each operator on a monthly basis for an approximate total of 1 hour per refresher session. Confirmation of proficiency of the work practice plan will be included in at least one refresher session given on an annual basis.

Operator training on this work practice plan will include all requirements identified in 40 C.F.R. § 63.7294(a), and as further discussed below in relation to the facility's specific operations. Such training will be undertaken, at a minimum, through the use of the following materials/activities:

- Attendance during in-person lectures by on-site personnel;
- PowerPoint presentations;
- Audio/visual materials; and
- On-the-job training.

2.2 COKE OVEN DAMPERING

40 C.F.R. § 63.7294(a)(2) requires all topside workers to understand proper dampering requirements.

In accordance with this requirement, all topside workers shall be trained that each oven is to be dampered off the collecting main prior to opening the standpipe cap. The following steps shall be taken by all topside workers when dampering each coke oven:

1. The topside worker will confirm the daily oven schedule throughout the day in order to ensure that the proper oven is being dampered at its proper time.

2. The topside worker will proceed in a timely fashion to the coke oven scheduled to be dampered.

3. The topside worker will then re-confirm the number of the specific coke oven to be dampered in order to ensure that the proper schedule is being followed.

4. Once all appropriate information is confirmed, the topside worker will then begin the dampering process by lowering the dampering arm down in-place to start effectuating a proper seal.

5. Once the dampering arm is lowered in-place, the topside worker will then lift the gooseneck cap by using a lid bar or the damper tool.

6. Upon lifting of the gooseneck cap, the topside worker is then to use the damper tool to ream the gooseneck cap extension for purposes of cleaning out the gas passage.

7. After the gooseneck cap extension is reamed, the topside worker is to look inside the gooseneck to confirm the liquor spray is working properly, and spraying in the proper pattern.

8. Upon confinnation of liquor spray working properly, the dampering process is complete. Topside workers will receive training and familiarity with these required dampering techniques, which shall include directly supervised instruction during on-site operations until such time that on-site supervisory personnel are satisfied that the operator is proficient in the task.

2.3 SOAKING EMISSIONS IGNITION

40 C.F.R. § 63.7294(a)(3) requires all topside workers to determine the cause of soaking emissions that do not ignite automatically. This requirement includes any emissions that result from raw coke oven gas leaking from the collecting main through the damper, and emissions that result from incomplete coking.

In accordance with this requirement, all topside workers shall be trained on proper visual inspection techniques to ensure that the soaking emissions ignite automatically. Furthermore, topside workers will be provided detailed on-the-job training and instruction to identify circumstances where raw coke oven gas (COG) has leaked from the collector mains through the dampers, or when incomplete coking emissions have been released. Because of the nature of raw COG, in-person observance and instruction by experienced supervisory personnel is the most effective means of training. However, it should be noted that raw COG is yellow, which should be a direct indication to the topside worker that an issue is present.

Initial and refresher training will include discussion on this topic, and confirmation that topside workers are aware of the requirement.

2.4 CORRECTIVE ACTIONS TO ADDRESS COLLECTOR MAIN LEAKS

40 C.F.R. § 63.7294(a)(4) requires all topside workers to take corrective actions to eliminate soaking emissions when they are caused by leaks from the collector main. Examples of such corrective actions included in the regulatory citation are "reseating the damper, cleaning the flushing liquor piping, using aspiration, putting the oven back on the collecting main, or igniting the emissions."

In accordance with this requirement, all topside workers will be trained on the proper use, and implementation of~, the specific corrective actions identified in 40 C.F.R. § 63 .7294(a)(4). Depending on the circumstances, corrective action taken by the topside worker may include one or more of the following:

- Lifting and reseating of the damper arm in place to effectuate a proper seal.
- Putting the oven back on the collector main. Turning off the liquor spray to the appropriate coke oven. Removing the plug from the spray line, and cleaning it with an appropriate tool to address any potential issues. Redampering to observe the process again to ensure the corrective action was effective.
- If at time of observing the liquor spray, the topside worker cannot make visual confirmation of the liquor spray pattern, the worker may turn on the aspirating steam to provide assistance with visual confirmation.
- In the event that there is some residual gas remaining in the coke oven, the topside worker may ignite any emissions.

In addition to the tasks outlined in this Section 2.4, General and Battery Foreman will advise operators, when applicable, on other techniques or strategies for addressing corrective action that may be appropriate.

2.5 CORRECTIVE ACTIONS TO ADDRESS NON-COLLECTOR MAIN LEAKS

40 C.F.R. § 63.7294(a)(5) requires all topside workers to be trained to notify a designated responsible party in a circumstance where soaking emissions are not being caused by leaks from the collector main. In such a circumstance, the designated responsible party must identify whether the soaking emissions are due to incomplete coking. If incomplete coking is the cause of the emissions, the oven must be placed back on the collector main until it is completely coked, or such emissions are ignited.

In accordance with this requirement, all topside workers will be trained to notify either the General or Battery Foreman, depending on the current shift schedule, in a circumstance where soaking emissions are not being caused by leaks from the collector main. All topside workers are notified who the responsible supervisory personnel shall be for that specific shift. Notification will be provided to such designated responsible party via radio or verbal communication. The General and Battery Foreman will be trained to coordinate to confirm if a leak is due to incomplete coking. If it is determined that incomplete coking exists, the responsible party or a designee will either put the oven back on the collector main, or ignite the emission, depending on the underlying circumstances applicable to the leak.

3.0 STANDARD OPERATION PROCEDURES PERTAINING TO THIS WORK PRACTICES PLAN

ECC has developed a Standard Operating Procedure — SOP-BAT-l6 — in conjunction with the development of this plan as a short-hand reference source for topside workers.

APPENDIX D

OPERATIONS & MAINTENANCE PLAN

STARTUP, SHUTDOWN & MALFUNCTION PLAN

Foundry Coke Production

Document: **OMP/SSMP**

Location: **Erie, PA**

Revision: **4**

Date: **03/29/2019**

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1. INTRODUCTION

The purpose of this combined Operation and Maintenance Plan (O&M) and Startup, Shutdown and Malfunction Plan (SSMP) is to comply with the NESHAP provision in 40 C.F.R. 63.6(e)(3) 40 C.F.R.63.310 and 40 C.F.R. 63.7300.

The Plan gives a description of the procedures for complying with these requirements. Coke oven batteries are unique, as compared with other industrial processes, in that once the ovens are started during the initial heat-up sequence, they can never be shut down. Shutting down the ovens would cause the bricks to contract to their unheated size, which would induce structural failure. Shutting down ovens to minimize emissions is not a feasible option, because serious structural damage would result. Based on this, the SSM plan will address only those processes that have a typical startup and shutdown mode.

Erie Coke Corporation (ECC) operates two batteries of foundry coke ovens at its facility in Erie, Pennsylvania. Coke is the non-volatile carbonaceous product of coal distillation. Foundry coke is produced by baking coal in ovens at temperatures up to 2100°F in an oxygen free environment. The Facility receives raw material coal via an internal rail system or via truck. The coal stock is processed through a breaker and hammer mill and is stored in coal blending bins. The raw material coal is then fed to an oven charging coal bin where it can be directed via a device called a Larry Car to one of the 58 ovens located in one of two coke oven batteries, designated as Battery A and Battery B.

The Larry Car begins the coal charging process by transporting the coal to an empty oven that is ready for charging. As the coal is dropped from the Larry Car into the empty oven, piles are formed. In order to level the piles for optimum coking, a bar, called a leveling bar, is inserted into the charged oven through a leveling door. The leveling bar is used to push over the charged coal piles in the oven to ensure a consistent space above the charge for the proper collection of the gases generated during the coking process. The coking operation begins following the closure of the leveling door. The coal charge is typically baked for up to 28 hours in the coke ovens to ensure that optimum foundry coke quality is achieved. The vapors volatilized during this process are condensed to ambient temperature for recovery. Vapors with a low boiling point are returned to the coke ovens in gaseous form, where they are combusted to provide heat to the oven flues, or are directed to the on-site boilers for use as fuel. Combustion gases from the battery underfire system ultimately exhaust through the facility's main stack; combustion gases from the boilers exhaust through the boiler stacks.

When the coking process is complete, oven doors on both sides of the battery are opened and a device known as the pusher is moved into place. A ram extends from the pusher and discharges the hot coke from the pusher side of the oven into a quench car on the coke side of the battery. A coke-side shed (CSS) collects dust emissions during this process. The quench car then travels on rails to the quenching station where the hot coke is deluged with approximately 10,000 gallons of water to quench (cool) the material. Quench tower baffles minimize airborne emissions from the quenching operations.

Once quenched, the coke is bottom discharged from the quench car to a coke wharf. The coke is mechanically moved from the coke wharf to the coke screening operation where it is processed through screens in preparation for delivery to the customer via rail or roadway.

One of the requirements of the MACT Standard is that a Startup, Shutdown and Malfunction Plan (SSMP) be created, followed and maintained.

2. OBJECTIVES

The objective of the Startup, Shutdown and Malfunction Plan (SSMP) is to ensure that all non-steady-state operations of the operation (startup, shutdown or any period following an equipment malfunction) are compliant with the MACT Standard including the following key elements:

1. Operation is compliant with all relevant air emission standards.
2. Equipment is operated and maintained according to industry best practices.
3. Malfunctions are corrected as soon as practicable.

This plan also includes an Operations and Maintenance Plan, to address various requirements of the facility (and State) Plan Approval No. 25-29C and 40 C.F.R. 63.7300.

3. SYSTEM OPERATION and MAINTENANCE

The following combines a technical description of the system, with a discussion of key operating requirements and methods. The initial overview is followed by descriptions of specific unit operations and functional systems. The most likely malfunction modes for each will also be noted.

3.1 Overview

The process was described in the Section 1. Introduction. Specific areas of the plant covered by the MACT standard and state Plan Approval are:

- The coke ovens and specifically sealing methods (sealing is discussed in detail in the Work Practices Plan).
- The coke side shed (CSS)
- Quenching operations

Balance of the system is discussed herein in less detail.

3.2 Instrumentation and Controls

The process is controlled by operations personnel and a network of instruments and computing hardware. Each individual fuel burner is controlled by a Burner Management System (BMS). Key data points report to a control panel in the centralized heater room, where operators convene to monitor plant conditions, plan activities related to the operation of the batteries and necessary inspection and maintenance, and break between pushing and other operations.

3.3 Continuous Monitoring Systems

The facility is equipped with both several continuous parameters and one continuous opacity monitoring system as described below.

3.3.1 Continuous Parameter Monitoring

Various measurements are necessary for optimization and control of the coking process. These include weights, temperatures, pressures, and flows. A subset of these parameters is identified as relevant to pollution control aspects of various equipment. These instruments will be tabulated in later sections, and data are generally recorded as a means of supporting compliance records for the site.

3.3.2 Continuous Opacity Monitoring

A Continuous Opacity Monitoring System (COMS) is installed on the plant chimney, which exhausts combustion gases from the battery underfire systems to atmosphere. The instrumentation, a Model 560 Opacity Monitor and associated software, record the opacity, and document any exceedance of opacity limits as established by governing regulations. Quarterly calibration audits are completed by Teledyne Monitor Labs. A maintenance agreement is in effect with Teledyne Monitor Labs in the event of an emergency, to maintain proper operation of the COMS. Technical support is also provided by Teledyne Monitor Labs.

3.4 Coke Ovens

Coal is blended to optimal oven feed mixture and delivered to the ovens in the "Larry" car, from which it flows by gravity through charging ports into an oven that has previously been "pushed" empty. The resulting coal piles are leveled, and the oven is closed completely; oven doors and charging ports are luted to ensure a seal. The non-condensable vapors leaving by-product recovery are combusted in burners beneath the coke ovens, and the hot combustion gases pass through an array of flues around and amongst the ovens. These exhaust gases end up exiting the system though the main stack. When the batch of coal an oven is deemed to have been "coked" thoroughly, the doors on the oven are opened and the hot coke is "pushed" out into a rail car stationed on the "coke side" of the batteries. Fugitive particulate emissions resulting from this procedure are captured by the CSS and baghouse system. Scheduling of the pushing (and-refill) cycle on the 58 ovens is a crucial operations focus on a continuous basis. An outside contractor conducts an EPA Method 303 inspection on a daily basis, recording the visual emission from 5 charges, the number of leaks from doors (if any), the number of lids leaking (if any), any offtake leaks, and collector main pressure. These parameters are recorded on a daily basis and 30-day rolling average. The equipment that is needed to operate the coke oven battery can break down, and require repairs to continue operations.

Where spare equipment is not available i.e. Pusher, Larrycar, Backdoor Machine, Reversing System Components, operations are suspended until appropriate repairs are performed. This does not result in any abnormal emissions. When the repair is completed, normal operations are resumed without additional emissions.

3.4.1 RECORDING UNDERFIRING GAS PARAMETERS

3.4.1.1 In accordance with this requirement, all underfiring gas parameters (as identified in Section 3.4.1.2 below) are recorded on a per shift basis by the Heatermen assigned to the battery for that specific shift.

3.4.1.2 The Heatermen's job duties can be found in the applicable standard operating procedure, for which 80 hours of training is provided. Included within the Heatermen's job requirement is the obligation to document, on a per shift basis, the underfiring gas parameters. All underfire gas parameters are to be maintained on a per shift basis, to reach the battery average specified by the Heater Foreman to ensure complete coking. These parameters include:

- Pusher Side Manifold Pressure at A battery
- Coke Side Manifold Pressure at A battery
- Main manifold pressure on B battery
- Both Battery Stack Draft
- Both Waste Heat Temperature
- Plant Gas Pressure
- Both Coke Oven Gas Flow

The Heater Foreman or General Forman is to review the Heaters Check List for completeness and accuracy per shift, and direct any changes in the underfire gas parameters, as needed, to maintain the desired battery average; these parameters will be adjusted accordingly.

3.4.2 RECORDING BATTERY OPERATING TEMPERATURE

3.4.2.1 In accordance with this requirement, all battery operating temperatures are recorded on a per shift basis by the Heatermen, including daily cross-wall readings. For purposes of complying with this obligation, battery temperatures are read with a pyrometer, and the temperatures are recorded. The Oven Foreman and the Heater Foreman are responsible for reviewing the findings in the Heater Report per shift, and determine if any adjustment is needed in the operating temperature to ensure complete and uniform coking.

3.4.3 PROCEDURES TO PREVENT PUSHING AN OVEN BEFORE BEING FULLY COKED

3.4.3.1 ECC maintains a minimum battery coking time of 24 hours plus maintaining minimum oven temperatures

Specific coking times (of 24 hours or more) and pushing schedules are established by on-site supervisory personnel and management based on customer demand and operational requirements. These schedules will be finalized in advance, and circulated to all appropriate personnel. This coking time and minimum

temperature schedule largely eliminates the possibility of a pushing an oven before it is fully coked.

If operational exigencies require that an oven be pushed with less than 24 hours of coking time, the Oven Foreman must verify complete coking at the time of the push, and document the fact of complete coking and the reason for an early push on the Oven Foreman Log. The Oven Foreman log is reviewed by the Battery Foreman on a regular basis, and is sent to the Plant Manager. If an early push is determined to be necessary, the Oven Foreman will verbally notify the Battery Foreman of the circumstances.

3.4.4 PROCEDURES TO PREVENT OVERCHARGING AND UNDERCHARGING OF OVENS

3.4.4.1 In accordance with this requirement, the Charge Car Operator is responsible for fully filling the charge car from the battery coal bunkers, and ensuring the car is empty after the charge. The job duties of the charge car operator are documented in the applicable standard operating procedure.

3.4.4.2 The Pusherman is responsible for verifying that the oven is sufficiently full by leveling the oven during the charge. When an oven is sufficiently full, the Pusherman will drag coal back out of the chuck door while leveling. Due to the nature of the levelling process, any overcharging would result in additional coal to pulled out of the oven with the levelling bar, preventing commencement of the coking process in an overcharge situation. If the oven has been undercharged, the Pusherman will not pull coal back through the chuck door, and at that time will notify the Oven Foreman that there is not enough coal in the oven; in that event, the Charge Car Operator will be directed to charge additional coal into the oven, and the ensuing leveling process will ensure that the oven is properly charged. The job duties of the Pusherman are documented in the applicable standard operating procedure.

3.4.4.3 In a circumstance where a concern is identified by the Pusherman that an under or overcharge has occurred, the Oven Foreman will be notified, who will then determine if such an event did occur, and if so, whether an overcharge or undercharge was a singular occurrence, or if a volumetric adjustment needs to be made to the charge car. The charge car is equipped with volume rings at the top of each of the hoppers for manual adjustment of coal volume, to allow for the loading of more or less coal into the hopper, if necessary, at the Oven Foreman's discretion.

Under and Overcharging is minimized visually but ECC also measures coal moisture and density multiple times each week for verifications.

3.4.5 PROCEDURES FOR INSPECTING FLUES, BURNERS, AND NOZZLES

3.4.5.1 Job duties of the Heatermen include inspecting flues, burners (combustion), and nozzles during the recording of battery operating temperature and performing cross wall readings.

3.4.5.2 Specific issues within a flue are identified during the recording of battery operating temperature and cross wall readings, which includes visual inspection at such time. Action is to be taken immediately to address any potential issues causing temperature or combustion abnormalities. Some examples of issues that would normally affect combustion related to this Section include:

- Plugged nozzles
- Obstructed airports
- Plugged gas piping

3.4.7 CAPTURE SYSTEMS AND CONTROL DEVICES

3.4.7.1 Inspections.

The monthly inspections of all equipment that ensure the proper operation and performance of the emissions capture system are organized and scheduled to be conducted by various departments including Environmental, Instrument and Maintenance. This inspection includes observations of the physical appearance of the equipment (e.g., for presence of holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion) . In the event a defect or deficiency is found in the capture system (during a monthly inspection or between inspections), repairs are completed within 30 days after the date that the defect or deficiency is discovered. If the inspecting department determines that the repairs cannot be completed within 30 days, he must submit a written request for an extension of time to complete the repairs; this written request must be sent to the Air Quality Program at Pennsylvania Department of Environmental Protection ("DEP") and received by DEP not more than 20 days after the date that the defect or deficiency is discovered. The request must contain a description of the defect or deficiency, the steps needed and taken to correct the problem, the interim steps being taken to mitigate the emissions impact of the defect or deficiency, and a proposed schedule for completing the repairs. The request shall be deemed approved unless DEP notifies ECC that it objects to the request. DEP may consider all relevant factors in deciding whether to approve or deny the request (including feasibility and safe-ty). Each approved schedule must pro-vide for completion of repairs as expeditiously as practicable, and DEP may request modifications to the proposed schedule as part of the approval process.

3.4.7.2 Preventative Maintenance

Preventative maintenance for each control device, including a preventative maintenance schedule that is consistent with the manufacturer's instructions for routine and long-term maintenance.

3.4.7.3 Pushing Emission Baghouse Corrective Action

In the event a bag leak detection system alarm is triggered, the Maintenance Dept. will initiate corrective action to determine the cause of the alarm within 1 hour of the alarm, initiate corrective action to correct the cause of the problem within 24 hours of the alarm, and complete the corrective action as soon as practicable. Actions may include, but are not limited to: (i) Inspecting the baghouse for air leaks, torn or broken bags or filter media, or any other condition that may cause an increase in emissions. (ii) Sealing off defective bags or filter media. (iii) Replacing defective bags or filter media or otherwise

repairing the control device. (iv) Sealing off a defective baghouse compartment. (v) Cleaning the bag leak detection system probe, or otherwise repairing the bag leak detection system. (vi) Suspending pushing operations until a repair or replacement can be completed The Environmental Manager will maintain the corrective action records.

3.5 Coke Side Shed

The coke-side shed (CSS) consists of two free-standing structures, with siding, lighting and guttering, designed to cover the track and coke discharge-side doors of each oven in batteries A and B. Ductwork the length of each shed is designed to collect air emissions from pushing.

Each shed exit duct is then equipped with a butterfly damper that can be used to isolate the shed. The combined exit duct is equipped with temperature indication as a means to detect fire and other operational excursions. The duct tees off to enter two baghouses. Each inlet duct is equipped with a flange fitting that can be blinded to isolate the baghouse to which it is connected. Downstream of that flange there is a 4" water spray nozzle, and a funnel-type fitting so that precoat material can be added to the bags.

Each baghouse is equipped with 1,005 cages and Nomex bags above two solids compartments. The pressure drop (DP) is measured across each baghouse and this measurement is used to control bag cleaning, which is effected by pulsing compressed air inside each row of bags sequentially to blow off collected solids and drop them into the compartment below. Air locks and conveyors deliver these solids into containers for recycling where possible, and disposal if necessary.

The exit of each baghouse is equipped with a temperature indication, which can be compared to the inlet temperature as further indication of fire or other problems. A leak detector is also installed in each exit to monitor for bag leakage. Motive force for flow through each baghouse is provided by a 300 HP induced draft fan, which exhausts into a single steel stack. An ammeter on each of these fans provides a relative measure of air flow pulled by the fan. Ordinarily one fan is on and the other is an installed spare. Both fans can be run in unusual circumstances and/or to maximize air removal from the sheds. If an alarm sounds for a bag leak, the operator will start the stand-by baghouse and shut down the baghouse that is in operation. A visual check will be conducted to determine if a bag has ruptured. If a bag has ruptured it will be replaced with on-site replacement bags.

The system is inspected each shift by Maintenance and the data and other observations from this inspection are recorded on the daily form included in Appendix A. Maintenance and other activities will be tracked on this form as well. The baghouses will be "switched" at least once per quarter to allow internal inspection.

Motor amperes are recorded at least once during each 8-hour shift by shift maintenance staff and records are maintained by the Environmental Manager.

Baghouse pressure drop is recorded at least once every 24 hours by shift maintenance staff and records are maintained by the Environmental Manager.

Monthly inspections are performed of each baghouse by shift maintenance staff and records are maintained by the Environmental Manager. They consist of:

- Solenoid valves
- Air supply
- Hopper screws
- Rotary valves
- Visual checks of bags and cages and bag tension

3.6 Quench

Hot coke is pushed onto a specially designed rail car. That car is moved with a locomotive into a quench tower, where the coke is flooded with recirculated water to cool it for safe handling. The car is then moved adjacent to the coke wharf, where it is emptied. The car is then moved into position for the next oven push. The coke is conveyed to a screening system. On a weekly basis, a quench water sample is collected by the laboratory technician or Wastewater treatment plant operator and analyzed by an accredited lab, documenting the total dissolved solids (TDS) for each sample collected. The PADEP requirement is to maintain quench water TDS concentrations at or below 1100 mg/L.

3.6.1 Baffles

On a daily basis, the baffles in the quench tower are rinsed; the time is recorded. In the event that the temperature is less than 30 degrees F throughout the day, this rinse cycle is not required; in that event, the temperature will be continuously recorded until it exceeds 30 degree F threshold. In the event of a water or mechanical failure to the rinse system, repairs can be made within 24 hours and the system will be placed back on line in time for the next day's rinse cycle. *See also* Work Practice Plan discussions of baffles. The Battery Forman has responsibility for the baffles.

3.7 By-Product Recovery

Gases volatilized out of the coal during the coking process are initially cooled in the "collector" main gas header at the batteries. The organic liquids and gases then flow to the by-product recovery system, which removes high boiling point organics for sale as a by-product. The low boiling organics are directed back to the ovens in gaseous form, where they provide the fuel needed to heat the coke through the external flue system. High boiling point organics are removed to a liquid stream with a combination of absorption and water cooling.

Motive force for exhausting the volatiles from the ovens, and routing them back to the burners, is provided by gas "exhausters" that pull suction on the ovens and provide pressure to the burners. An electrically driven exhauster is the main source of this "prime mover" function for the system. Two

older steam piston driven exhausters provide backup to this unit. If necessary, a switch to the back-up exhausters requires approximately five minutes, and during that time the gases can be routed to a flare stack, which minimizes emissions while providing operational continuity. A spare motor for the electrically driven exhauster is on hand in the event of a motor failure. The gas recovery system is set up with a jumper pipe connecting the "A" Battery and "B" Battery collector mains. This provides continuous gas flow to the by-products recovery system even if one of the collector lines becomes plugged. The plugged line can then be cleaned with the use of steam, and the gas flow would continue in the direction opposite of the plugged line.

3.8 Coke Storage & Handling

Newly produced coke is conveyed from the wharf through a screening system, which separates the product into various size ranges. Oversized coke can be crushed, and the different ranges are stored in rail cars, trailers, bins and even piles for ultimate shipping to customers.

3.9 Utilities

Steam is generated in two boilers that can fire oven gas or natural gas, or a blend of both. The steam generated provides heating and process needs, can operate steam-driven equipment in the plant, and drives a turbine-generator that provides the bulk of the facility's power requirements if needed. Steam failure does not jeopardize plant operations immediately, although power must immediately be available from off-site.

Electricity is provided by Penelec; in the event of a power outage, electricity can be generated on-site utilizing the turbine-generator driven by the two boilers.

Water is used in steam generation, non-contact process cooling, and by-product recovery. Non-contact cooling water is drawn from Lake Erie with an on-site system.

The City of Erie municipal water utility supplies boiler makeup and process water.

Process wastewater is treated in an on-site biological pretreatment system before discharge to the City of Erie wastewater treatment plant.

3.10 General Housekeeping

The Assistant Plant Manager shall take all reasonable actions to prevent particulate matter from becoming airborne. These actions include, but not be limited to, the following:

1. **Use, where possible, of water or chemicals for control of dust in the demolition of buildings or structures, construction operations, the grading of roads or the clearing of land. ECC owns and maintains a water tryuck for daily use.**
2. **Application of asphalt, oil, water or suitable chemicals on dirt roads, material stockpiles and other surfaces which may give rise to airborne dusts.**
3. **Paving and maintenance of roadways.**
4. **Prompt removal of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, erosion by water, or other means including the regular contracting for a local street sweeper.**
5. **Regular entry and exit of traffic from the facility shall be by the front gate only, which is situated so that tracking of material beyond the facility is effectively avoided. In the event entry or exit from another gate is required, permission shall be obtained from the Environmental Manager, and measures such as tire washing shall be directed and implemented to ensure no material is tracked from the facility onto roadways outside of the facility.**

4. SSMP IMPLEMENTATION

Planned startups and shutdowns of those components that can be shut down and restarted occur infrequently, driven by the maintenance needs of the equipment and to a lesser extent by inventory of product available for shipment. The system is configured with interlocks that are installed for safety or equipment protection.

The equipment that is needed to operate the coke oven battery can break down and require repair to continue operations. Where spare equipment is not available (i.e. Pusher, Larry Car, and other components) operations are suspended until appropriate repairs are performed. This does not result in any abnormal emissions. When the repair is completed, normal operations are resumed without additional emissions.

This plan is in force at all times. Any departure from this plan must be reported as discussed in sections 8 and 9.

5. STARTUP PROCEDURES

Prepare the equipment for startup by making sure that all manual valves are in their proper position and all utility sources are energized. Blinds must be removed from fuel supply and other piping and plenums. Key steps in this procedure ensure that:

1. Lockout devices are removed and allow safe restart.
2. Safety instrumentation and systems are activated.
3. All tools and maintenance materials are removed.
4. Air, natural gas, and other pipelines are reconnected.
5. Burner guns are installed.
6. Safe work permits are removed and forwarded for filing.
7. Burner pilot systems are ready to light.

Completion of these steps restores control of the system to the operations crew. If start-up is for a single oven or sub-set of the entire system, recovered gas will be the fuel. Natural gas is available as a back-up when the situation warrants it.

6. SHUTDOWN PROCEDURES

Shutdown procedures for the following scenarios are provided below.

1. Section 6.1 – Partial shutdown.
2. Section 6.2 – Emergency shutdown.
3. Section 6.3 – Malfunction

In all cases, the temperature of the refractory systems must be changed slowly to avoid damage caused by excessive thermal stress.

6.1 Partial Shutdown

A partial shutdown is planned but brief and may be done for one of the following reasons:

- Individual oven(s) maintenance or clean-out.
- Maintenance that requires vessel entry or other complex safety permitting.

Redundancy throughout the plant will allow for such activities without meaningfully affecting emissions. Impacted ovens can be controlled "in neutral" to avoid overheating the coke product for brief periods. Vent gases (normally routed to byproduct recovery) can be directed to flare when capacity or piping is impaired by partial shutdown.

The CSS Baghouse system is designed with complete redundancy, and response to a malfunction in the on-line baghouse can include simply turning on the baghouse and fan that had not been running.

6.2 Emergency Shutdown

The operator response to a power failure or other emergency shutdown is immediate and focuses on:

- Ensure equipment and personnel safety.
- Minimize environmental emissions.
- Facilitate power and system restoration to service.
- Return to normal operation promptly and safely.
- Maintain communication throughout the incident.

Key steps in this procedure are summarized below. Some of these steps may be unnecessary in a less severe emergency situation.

- Confirm emergency shutdown status and communicate through facility.
- Isolate leaking or otherwise failed equipment.
- Restore utilities as needed.
- Maintain communication.
- Monitor critical parameters and develop system restart plans.

The control room is equipped with a battery-based uninterruptible power supply (UPS) to ensure that critical instruments and monitoring system remain available for use. This system is completely overhauled on an annual basis to ensure reliability. It keeps lighting, DCS, and communication systems energized during a power failure for safety reasons.

Outside operators will secure non-critical equipment as part of their initial emergency response. Once power is restored, and/or other problems are resolved, system restart must be approved by plant supervision.

6.3 Malfunction Shutdown

Significant malfunctions – instrument, mechanical, or other - can ultimately lead to a shutdown. The Continuous Opacity Monitoring System ("COMS") is a key to minimizing emissions resulting from malfunction. The other key is the trained operating crew that is constantly observing CMS output, other instrument data, and field operating conditions. Where necessary, the operating crew will decide to shut down the plant or a portion of it preventively, to minimize the scope of repairs that may be needed. Typical areas of malfunction, and the resources available for corrective action, are discussed in the following section.

7. MALFUNCTION RESPONSE

USEPA defines a malfunction as:

> *"Any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions."*

Malfunctions shall be corrected as soon as practicable after their occurrence. When observation of a malfunction is observed, it is the intent of ECC to demonstrate to the Administrator that it has been detected and corrective action is underway. If the malfunction manifests itself as a violation of opacity, then the certified observer, if onsite at the time, will be notified. The DEP will be notified in writing within 24 hours of the malfunction occurrence first being documented.

Within 14 days of the 24-hour notification made, ECC will submit a written report describing the time and circumstances of the malfunction and describe any actions taken that might be considered inconsistent with this plan. The Environmental Manager will maintain a record of internal reports which form the basis of each malfunction notification.

The onset of malfunctions in the system will be detected by instrumentation and operator judgment. This allows early response before the impact of the malfunction meaningfully increases emissions or causes extensive damage. The combination of human and machine monitoring is an established means of keeping systems like this running well.

If a leak or equipment problem is detected by the operator at any time, the procedure is to identify the specific problem and shut down the component immediately for repair. If repairs can be affected without shutdown, and without excess emissions, such an effort is acceptable. If this procedure is not followed for any reason, the incident will be considered a deviation from this SSM Plan.

Any other malfunction that results in the emission of combustion gases or other air pollutants will be considered a deviation from this SSM Plan. The malfunction of a critical instrument is the most likely cause of such emissions. Routine preventive maintenance of instrumentation, and redundancy in many cases, is intended to ensure that such malfunctions do not occur. The plant maintenance

department generally performs malfunction repairs.

If a malfunction occurs, spare parts for each major component are stocked in the plant storeroom so as to minimize downtime. Plant maintenance personnel are available as needed to inspect or adjust equipment to prevent and of course correct malfunctions. The Operations and Maintenance Plan describes facility preventive and predictive maintenance procedures that are intended to minimize the frequency of malfunctions.

The malfunction modes highlighted in Section 3 are listed below, with a general description of the preventative measures and response procedures for each.

Instrumentation - Instrumentation maintenance procedures include preventative and episodic repairs in response to operator observations. Detailed calibration and overhaul is enhanced by more frequent maintenance attention as needed. Operators are constantly observing parameter output, and will create a work order for one-time check when any parameter appears to be problematic. Completion of the work order by a trained technician will ensure that the concern is addressed, repaired, and documented.

Calibration – The COMS is reviewed routinely by a trained maintenance technician for operability, as discussed above. Documentation of this instrument, its output and maintenance history, is a heavily regulated specific task at the plant.

Electrical – Power failure is an event that is planned for as an emergency shutdown, but can easily be an external event not associated with on-site systems. The main electrical switchgear bringing power into the plant is overhauled every few years to ensure its integrity. Substations around the facility distribute power to the individual circuits that power motors, etc. These are inspected on a rotating basis, and repair is performed as necessary. Failure of any particular circuit will lead to a brief plant shutdown if necessary. Maintenance personnel in the plant are equipped to repair a variety of minor electrical repairs, and contract assistance is on call for further repair where needed.

Mechanical – Pumps and other rotating equipment are monitored by a plant preventative maintenance program to allow repairs before a major failure occurs. Many such unit operations are installed with spares to allow operations to continue while repairs are made. When this is not the case, brief shutdowns are taken of entire incineration trains, or subsystems where feasible, to effect repairs. A crew of trained maintenance personnel is available at the site to allow for timely and efficient repairs. Additional personnel and contract employees can be called in as needed.

Refractory – Depending upon their location, refractory bricks and components might last well over 10 years. Monitoring of these linings is a key task during each coke "push", as repairs are time-consuming and require precise scheduling. The smaller the repair, the better, and therefore routine observation can identify problems at the earliest possible stage.

Water Failure – Process and cooling water is used in the powerhouse and by-product recovery areas. Boiler water is necessary to maintain steam supply throughout the plant, and power

production there as well. Redundancy of water supply supports this operation directly, as both city water and a pump drawing water out of Lake Erie can supply this need. Process water in by product recovery contains organics and is treated on-site prior to discharge. The treatment plant must be operating to allow this, though waste water can be both cycled up and stored to bridge a short shut down of that process. The same mechanical and electrical reliability programs described previously are in place on this portion of the plant.

8. SSM RECORDKEEPING

Startups, shutdowns and malfunctions are documented by the Assistant Plant Manager in the facility operating record, which is maintained at the Environmental office. Any deviations from the procedures referenced in this plan, or the plan itself, will be further documented by an electronic message to the Environmental Supervisor and Operations Manager. These individuals will evaluate whether the deviation led to any excess emissions, and will proceed accordingly. Ultimately, a report to PADEP will be filed if excess emissions occurred. The primary communicator within the facility, in the event of a deviation, will be the shift supervisor. The Environmental Manager will direct external communication of such events.

9. SSM REPORTING

Periodic:

Erie Coke will report to PADEP semiannually the status of startups, shutdowns, or malfunctions that occurred during the previous six months (if one of these events occurred). Erie Coke will also report to the extent required if it modifies this Operation & Maintenance and SSM Plan.

Immediate:

Erie Coke will submit a report to PADEP if events occur during a startup, shutdown, or malfunction that is not consistent with this SSMP. PADEP will be notified verbally within two days of the inconsistency followed by a written report within 7 days after the end of the event. The reasons for not following the SSMP and whether any excess emissions and/or parameter monitoring exceedances are believed to have occurred will be communicated. All such incidents will be reviewed on an annual basis and appropriate modifications made to the plan at that frequency. Those revisions will be communicated to the PADEP as necessary.