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SOP Owner	M. Paul	**Approval**	R. Kalinowsky

Standard Operating Procedure – Lids and Offtakes Inspection

1. Purpose

The purpose of this SOP is to define how to properly read emissions from lids and offtakes on the battery top for EES Coke Battery LLC and document the inspections.

2. Scope

This document is intended to give a description on how to properly read, calculate, and report lid and offtake emissions on the battery top at EES Coke Battery.

3. Responsibilities

Sidock field personnel are responsible for implementing this procedure. Only field personnel certified to USEPA Method 303 shall perform lid and offtake inspections.

4. PPE Requirements

The following PPE is required for personnel responsible for implementing this procedure:

1. Standard Battery PPE (leather gloves; FR clothing; safety hood; hard hat; spoggles or safety goggles; radio; metatarsal safety boots; hearing protection; CO detector; ½- face respirator).

5. Required Equipment

The following equipment is required to implement this procedure:

1. Accumulative-type stopwatch or timer with unit divisions of at least 0.5 seconds.

6. Communication

1. Field Personnel shall sign into the log book at the Battery Foreman's Office before going to the battery top.
2. Field Personnel shall to speak to the Battery Foreman or Team Leader regarding any safety issues or other events that may affect the completion of this task before going to the battery top.
3. Field Personnel must confirm if any ovens are inoperable with the Battery Foreman/Team Leader before going to the battery top.
4. Field Personnel shall have a radio tuned to Channel #2 on their person.
5. If a reading cannot be obtained for any reason, Field Personnel shall immediately inform EES Coke Environmental personnel via text.

6. If the percent leaking lids for the daily traverse are calculated to be over 1%, Field Personnel shall immediately inform EES Coke Environmental personnel by text, and the Battery Foreman/ Team Leader verbally.
7. If the percent leaking offtakes for the daily traverse are calculated to be over 4%, Field Personnel shall immediately inform EES Coke Environmental personnel by text, and the Battery Foreman/ Team Leader verbally.
8. If more than three (3) ovens are dampered off in front of the oven being pushed, the EES Coke Environmental personnel, and the Battery Foreman/ Team Leader must be notified as soon as possible.

7. Safety Requirements

1. Field Personnel must be accompanied by the Battery Foreman or Team Leader when working on top of the battery.
2. Be aware of lids and flue caps. They are extremely hot and are a tripping hazard.
3. Be aware of the Larry Car. An alarm sounds when the Larry Car is in motion to alert personnel on top of the battery. Proceed to or stay within the yellow walkway to avoid being hit by the Larry Car when it moves.
4. Do not walk backwards.

8. Procedure

1. Observations of charging lids and offtakes must comply with USEPA Method 303 following the standards according to the Crowder Environmental Associates Method 303 Determination of Visible Emissions from By-Product Coke Batteries Classroom Course Manual.
2. Field Personnel must complete one valid traverse of lids and one valid traverse of offtakes each day, 7 days per week.
3. Lid and offtake observations are timed tasks. Traverses are valid if the elapsed times do not exceed 4 seconds per oven plus 10 seconds per leak, shown by the following:

   For lids (in secs): (4 sec/oven x 85 ovens) + (10 secs/leaking lid x number of leaking lids)

   For offtakes (in secs): (4 secs/oven x 85 ovens) + (10 secs/leaking offtake x number of leaking offtake)

4. Field Personnel shall document lid and offtake observations by completing the Method 303 Lids and Offtakes Certification Form (Form A-3).
5. Field Personnel may observe lids and offtakes with separate traverses for lids and offtakes or may observe lids and offtakes, simultaneously during one pass. When the lids and offtakes are observed separately, Field Personnel may observe either lids or offtakes first followed by the observation of the other.

6. If Field Personnel elect to observe lids and offtakes during one pass, they must designate the fact on the Method 303 Lids and Offtakes Certification Form (Form A-3).
7. Field Personnel shall observe lids and offtakes from the centerline of the battery.
8. When the lids and offtakes are observed separately, Field Personnel may observe either lids or offtakes first followed by the observation of the other. If the Field Personnel elects to observe offtakes first, they shall perform Steps 24-39 for offtake observations and return to Steps 9-23 to observe lids after the offtake observations are completed.
9. Field Personnel shall begin the lid observations at one end of the battery and traverse (walk) the length of the battery.
10. When starting the traverse, Field Personnel shall record the start time on the Method 303 Lids and Offtakes Certification Form (Form A-3) and start the accumulative-type stopwatch or timer.
11. Field Personnel shall traverse (walk) down the length of the battery at a steady, normal walking pace.
12. If Field Personnel encounter obstructions along the traverse path, the accumulative-type stopwatch or timer shall be stopped while the Field Personnel moves around the obstruction and the timer shall be restarted once the obstruction has been cleared.
13. If the observation of one or more lids is obstructed from the observer's view, the Field Personnel shall wait for the view to clear before proceeding. The timer shall be stopped while Field Personnel wait for the view to clear and shall be restarted when the view has cleared.
14. Field Personnel shall note any emission leaks from lids on the Method 303 Lids and Offtakes Certification Form (Form A-3). **Only leaks that are visible from the centerline of the battery while walking the traverse at a steady pace are counted as leaks.** The presence of yellow smoke from a lid or offtake is an indication of a leak. DO NOT count steam as a leak. Steam appears as a white plume. Multiple emission points on one lid count as one leaking lid. Visible emissions from the following are NOT considered leaks from lids, but should be noted on the inspection form under comments:
    - Between the brickwork and the oven lid casing.
    - Cracks in the brickwork.
    - Ports open for charging.
    - Ports undergoing maintenance work.
    - Flue caps.
    - Condensing water from sealing material.
15. Note any ovens that are inoperable on the Method 303 Lids and Offtakes Certification Form (Form A-3).
16. Note any ovens that are dampered off on the Method 303 Lids and Offtakes Certification Form (Form A-3).
17. Note the locations of leaks (i.e., the lid) on the Method 303 Lids and Offtakes Certification Form (Form A-3).

18. The accumulative-type stopwatch or timer shall be stopped when the Field Personnel reaches the far end of the battery.
19. The start time, stop time, and elapsed time (traverse time) for the traverse shall be recorded on the Method 303 Lids and Offtakes Certification Form (form A-3).
20. If the actual traverse time for lids exceeds the traverse time defined in Step 3, the traverse is not valid and Steps 9-19 must be repeated until the actual traverse time is less than or equal to the applicable allowed traverse time.
21. Field personnel shall compare the actual traverse time and the allowed traverse time calculated in step 3 and designate whether the traverse was a valid run on the Method 303 Lids and Offtakes Certification Form (Form A-3).
22. Field Personnel shall identify the oven number(s) for ovens that are dampered off and designate that the oven(s) are dampered off on the Method 303 Lids and Offtakes Certification Form (Form A-3) for each traverse.
23. Field Personnel shall identify the oven number(s) and locations of any lid leaks identified during each traverse on the Method 303 Lids and Offtakes Certification Form (Form A-3). If offtakes have already been observed, proceed to Step 39.
24. Field Personnel shall begin the offtake observations at one end of the battery and traverse (walk) the length of the battery.
25. When starting the traverse, Field Personnel shall record the start time on the Method 303 Lids and Offtakes Certification Form (Form A-3) and start the accumulative-type stopwatch or timer.
26. Field Personnel shall traverse (walk) down the length of the battery at a steady, normal walking pace looking ahead and back 2 to 4 ovens to get clear views of offtakes.
27. If Field Personnel encounter obstructions along the traverse path, the accumulative-type stopwatch or timer shall be stopped while the Field Personnel moves around the obstruction and the timer shall be restarted once the obstruction has been cleared.
28. If the observation of one or more offtakes is obstructed from the observer's view, the Field Personnel shall wait for the view to clear before proceeding. The accumulative-type stopwatch or timer shall be stopped while Field Personnel wait for the view to clear and shall be restarted when the view has cleared.
29. Field Personnel shall note any emission leaks from offtakes on the Method 303 Lids and Offtakes Certification Form (Form A-3). The presence of yellow smoke from an offtake is an indication of a leak. Multiple emission points on one offtake count as one leaking lid.
30. Note any ovens that are inoperable on the Method 303 Lids and Offtakes Certification Form (Form A-3).
31. Note any ovens that are dampered off on the Method 303 Lids and Offtakes Certification Form (Form A-3).
32. Note the locations of leaks (i.e., cap, flange, slip joint, base, piping, other location, or mini-standpipe) on the Method 303 Lids and Offtakes Certification Form (Form A-3).
33. The accumulative-type stopwatch or timer shall be stopped when the Field Personnel reaches the far end of the battery.

34. The start time, stop time, and elapsed time (traverse time) for the traverse shall be recorded on the Method 303 Lids and Offtakes Certification Form (Form A-3).
35. If the actual traverse time for offtakes exceed the traverse time defined in Step 3, the traverse is not valid and Steps 24-34 must be repeated until the actual traverse time is less than or equal to the applicable allowed traverse time.
36. Field personnel shall compare the actual traverse time and the allowed traverse time calculated in Step 3 and designate whether the traverse was a valid run on the Method 303 Lids and Offtakes Certification Form (Form A-3).
37. Field Personnel shall identify the oven number(s) for ovens that are dampered off and designate that the oven(s) are dampered off on the Method 303 Lids and Offtakes Certification Form (Form A-3) for each traverse.
38. Field Personnel shall identify the oven number(s) and locations of any offtake leaks identified during each traverse on the Method 303 Lids and Offtakes Certification Form (Form A-3).
39. Field Personnel shall document the total number of lid leaks and offtake leaks on the Method 303 Lids and Offtakes Certification Form (Form A-3).
40. Field Personnel shall calculate the % leaking lids and % leaking offtakes for the daily traverse on the Method 303 Lids and Offtakes Certification Form (Form A-3) as follows and round the percentages to the nearest 0.01%:

    $$\%\ \text{Leaking Lids} = \frac{\text{Leaking Lids Observed} \times 100}{\{\text{Number of Lids Per Oven} \times [\text{Total Number of Ovens on Battery} - \text{Number of Inoperable Ovens}] - \text{Number of Lids Not Observed}\}}$$

    $$\%\ \text{Leaking Offtakes/Mini-standpipes} = \frac{\text{Number of Offtake Systems with Visible Emissions} \times 100}{\{\text{Number of Offtakes Per Oven} \times [\text{Total Number of Ovens on Battery} - \text{Number of Inoperable Ovens}] - \text{Number of Stationary Jumper Pipes} - \text{Number of Offtakes Not Observed}\}}$$

41. Field Personnel shall describe any issues during the traverses, and if issues have been identified, document notification of EES Coke personnel regarding the issue and note the corrective action taken.
42. If more than three (3) ovens are dampered off in front of the oven being pushed, the EES Coke Environmental personnel, and the Battery Foreman/ Team Leader must be notified as soon as possible.
43. The following information shall be documented on the Method 303 Lids and Offtakes Certification Form (Form A-3):
    - The name of the inspector.
    - The date of the inspection.
    - The number of inoperable ovens and the oven numbers.
    - The crew.
    - The name of the battery foreman.
    - The start time for the traverse of the offtakes/mini-standpipes.

- The stop time for the traverse of the offtakes/mini-standpipes.
- The start time for the traverse of the lids.
- The stop time for the traverse of the lids.
- The oven numbers of any leaking offtake/mini-standpipes.
- The location of any offtake/min-standpipe leaks.
- The oven numbers of any leaking lids.
- The location of any lid leaks.
- The traverse time for offtake/min-standpipe inspections in minutes and seconds.
- The traverse time for lid inspections in minutes and seconds.
- The total number of seconds for the offtake/min-standpipe traverse.
- The total number of seconds for the lid traverse.
- The allowed traverse time for offtakes/min-standpipes is defined by the following formula:

  Allowed Traverse Time (secs) = (4 secs/oven x 85 ovens) + (10 secs/leaking offtake x number of leaking offtakes)

- The allowed traverse time for lid inspections is defined by the following formula:

  Allowed Traverse Time (secs) = (4 secs/oven x 85 ovens) + (10 secs/leaking lid x number of leaking lids)

- Whether the offtake/min-standpipe traverse was valid (i.e., within the amount of time defined by the allowed traverse time calculation).
- Whether the lid inspection traverse was valid (i.e., within the amount of time defined by the allowed traverse time calculation).
- The total number of offtake/mini-standpipe leaks.
- The total number of lid leaks.
- The percent leaking offtakes/mini-standpipes observed as defined by the following formula:

  $$\%\ \text{Leaking Offtakes/Mini-standpipes} = \frac{\text{Leaking Offtakes/Mini-standpipes Observed} \times 100}{\{2 \times [85 - \text{Number of Inoperable Ovens}] - 0 - \text{Number of Offtakes Not Observed}\}}$$

  Where the number of offtakes not observed includes the offtakes associated with the following: empty ovens (including those undergoing maintenance); ovens being charged or pushed; up to three (3) ovens dampered off prior to pushing; and up to three (3) additional ovens in the pushing sequence dampered off for cleaning, decarbonization, safety, or when a charging/pushing schedule involves widely separated ovens.

- The percent leaking lids observed as defined by the following formula:

  $$\% \text{ Leaking Lids} = \frac{\text{Leaking Lids Observed} \times 100}{\{4 \times [85 - \text{Number of Inoperable Ovens}] - \text{Number of Lids Not Observed}\}}$$

  Where the number of lids not observed includes the lids associated with the following: empty ovens (including those undergoing maintenance); ovens being charged or pushed; up to three (3) ovens dampered off prior to pushing; and up to three (3) additional ovens in the pushing sequence dampered off for cleaning, decarbonization, safety, or when a charging/pushing schedule involves widely separated ovens.
- Any issues observed during the lid and offtake inspections.
- The name and signature of the EES Coke personnel notified of observed issues, if applicable.
- The date and time that EES Coke personnel were notified of observed issues during the lid and offtake inspections, if applicable.
- Description of corrective actions implemented to address issues identified during the lid and offtake inspections.

44. Field personnel shall review the completed Method 303 Lid and Offtakes Certification Form (Form A-3) and confirm that all of the items specified in Step 43 above are documented on the form.
45. Field personnel shall document their review of the daily Method 303 Lid and Offtakes Certification Form (Form A-3) by initialing each element specified for the Lids/Offtakes Form on the Field Technician QA/QC Form for Daily Method 303 and Push-Travel Inspection Reports (Form A - Tech QC).
46. The Field Technician QA/QC Form for Daily Method 303 and Push-Travel Inspection Reports (Form A - Tech QC) shall be updated by Field Personnel daily prior to the distribution of the daily reports.
47. The completed Method 303 Lid and Offtakes Certification Form (Form A-3) shall be included in the daily inspection report and distributed in accordance with the requirements for the daily inspection reports specified in ENV-EES-YY.
48. **Once Field Personnel have distributed the completed Method 303 Lids and Offtakes Certification Form (A-3) to the Sidock Project Manager, or their designee, for QA/QC review, Field Personnel shall not modify any data on the hard copy form without consultation and coordination with the Sidock Project Manager, or their designee. Failure to follow this requirement may result in conflicting data between the hard copy records and the electronic recordkeeping system maintained by the Project Manager or their designee. Conflicting data may result in incorrect compliance calculations.**

9. References

1. USEPA Method 303
2. Crowder Environmental Associates Method 303 Determination of Visible Emissions from By-Product Coke Batteries Classroom Course Manual

10. Attachments

- Method 303 Lids and Offtakes Certification Form (Form A-3) (example)

Sidock Group, Inc.
ENGINEERS • ARCHITECTS • CONSULTANTS • PROJECT MANAGERS

Method 303 Lids and Offtakes
Certification Form
Form A-3

EES Coke Battery LLC Contact Information
Security/Emergency/Medical: 313-216-2499
Environmental Engineer (mobile): 734-320-5255

Facility Name: EES Coke Battery LLC

Inspector's Name:_____ **Date:**_____

Battery No. 5 **Total No. Ovens: 85** **Total No. of Inoperable Ovens:** _____

Crew:_____ **Battery Foreman:**_____

Start Time _____ **One Pass ( )** **Start Time** _____

Stop Time _____ **Stop Time** _____

OFFTAKES AND MINI STANDPIPES								
Oven	Location							
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS
	D	C	F	S	B	P	O	MS

Traverse Time _____ **min** _____ **sec =** _____ **sec**

LIDS					
Oven	Location				
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4
	D	1	2	3	4

Traverse Time _____ **min** _____ **sec =** _____ **sec**

D = dampered off
C = cap
F = flange
S = slip joint
B = base
P = piping
O = other
MS = mini standpipe

Allowed Traverse Time (Offtakes) = 340 + (10 sec * #leaks) = _____ **Valid Run? Yes No**

Allowed Traverse Time (Lids) = 340 + (10 sec * #leaks) = _____ **Valid Run? Yes No**

Total Offtake Leaks _____ **Total Leaking Lids** _____

$$\% \text{ Leaking Lids} = \frac{P_{ve} \times 100}{P_{ovn}(N - N_i) - P_{no}} = \frac{\_\_\_\_\_ \times 100}{4(85 - \_\_\_) - \_\_\_} = \_\_\_\_\_ \%$$

$$\% \text{ Leaking Offtakes} = \frac{T_{ve} \times 100}{T_{ovn}(N - N_i) + J - T_{no}} = \frac{\_\_\_\_\_ \times 100}{2(85 - \_\_\_) + 0 - \_\_\_\_} = \_\_\_\_\_ \%$$

Where: P_{ve} = Leaking Lids Observed, P_{ovn} = Lids per oven, P_{no} = Lids not observed, N= Number of Ovens, N_i = inoperable ovens, T_{ve} = Leaking Offtakes observed, T_{ovn} = Offtakes per oven, J = Permanent jumper pipes, T_{no} = Offtakes not observed

Any Issues? Describe _____
EES Person Notified of Issue _____
Signature_____ **Date / Time** _____
Corrective Action Taken_____
_____
_____
_____