**WORK INSTRUCTIONS FOR CLEANING LADLE BY ANCHOR & BACKHOE**

Responsibility: Bag house in-charge/Baghouse crane operator/Workmen supervisor

**Identified Hazards:**

1. Fall of a person from platform into pit or on ground
2. Contact of hot fumes, graphite flakes, solid debris & liquid metal
3. Emission of graphite dust
4. Impact of wheel loader/truck/crane/backhoe/breaker attachment on structures & persons around.
5. Impact due to swing of backhoe
6. Impact due to flying metal pieces.
7. Contact with graphite dust
8. Fall of anchor in the ladle
9. Human Behavior-Nonuse of PPE
10. Human Behavior-Improper house keeping
11. Inadequate local lighting
12. Crossing ladle pit barricade
13. Vision impairment due to glare at hot debris
14. Contact with hot metal & slag
15. Contact with dust
16. Contact with hot ladle
17. Damage to ladle refractory while cleaning with backhoe
18. Fall of ladle
19. Suspected fouling of vehicle on stairs

**Significant Aspect**:

1. Generation of fumes
2. Generation of heat from ladle

3.Generation of graphite

**Work Instructions:**

1. Baghouse in charge/Baghouse crane operator/Workmen supervisor should ensure that all personnel involved in the activity wear Proper PPE i.e. safety shoes, safety helmet, safety goggle and ear muff/ear plug etc.
2. Unauthorized operation or repair of any equipment is a punishable offence.
3. Ensure that the cleaning pit bottom area is properly leveled for ladle resting & no water is present in ladle cleaning pit.
4. Shift the ladle to the bag house after every pouring and Position the ladle in the ladle cleaning pit in such a way that the pit’s vertical mild steel stopper should not get damaged.
5. Bag house in charge should ensure that the ladle cleaning pit is always barricaded.
6. While anchoring the ladle, baghouse in charge should ensure that nobody including the operator stands in the swing direction of anchor and also below the crane hook, as wire rope snapping can cause an accident. Operator should position himself on the stand provided for cleaning for proper viewing of the ladle during anchoring when the ladle is placed on the ground.  In addition, HEMM movement in this area should be restricted during this activity.
7. During anchoring only loose jam should be lifted from ladle. Do not lift the hard jam, it can cause lifting of the ladle.
8. Judicious pulling by the crane should be done.
9. Hitachi/Backhoe with breaker attachment can be used for cleaning of ladles by placing ladles in ladle cleaning pit without damaging stoppers and barricades/Cleaning operation with breaker should not done when ladle is engaged to 25/12 ton hooks.
10. Baghouse crane should be parked beyond the swing area of Hitachi at all time to avoid damage to Hitachi and crane.
11. The person giving direction to the Hitachi operator should be very attentive and task focused during breaker operation.
12. Due to a close proximity requirement with earth moving equipment, Hitachi operator and person giving direction should be visible to each other at all time during the breaker operation to avoid accidental hit of the boom/breaker attachment/Hitachi machine during movement/operation.
13. The person giving direction should ensure that breaker point contact should be only on metal/slag jam and not on ladle plate or brick wall to avoid refractory damage. Due care and personal protective equipment should be used for flying objects which emit during ladle hitting by pointer.
14. The operator should preferably remain in safe location.
15. Ladle skin should be checked after 350 heats.
16. Ladle should not be used if safety layer of refractory lining is exposed.
17. PCM in charge should ensure ladle spout refractory is in good condition before using. If any refractory repair is required ladle is to be taken out of circulation, cooled and necessary repair to be taken up before ladle is put back in use.
18. While anchoring area has to be cordoned with chain placed on either side of the ladle. Baghouse in charge/ Baghouse crane operator/Workmen supervisor should ensure nobody should pass alongside when this operation is taking place.
19. Hitachi/backhoe should not be parked above the underground tunnel near PCM area for cleaning of ladles.
20. Maintain a safe distance from ladle & Hitachi/backhoe in case cleaning is done by Hitachi/backhoe.
21. After cleaning of ladle, dump the ladle debris in the bag house, apply the hydrous clay to the spout and send the cleaned ladle for use.
22. Re training of all operators for following SOP.

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| **Prepared By:**  Head – Production PID I | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Head – Pig Iron Division |
| **Signature:** | **Signature:** | **Signature:** |
| **Date: 10.07.2023** | **Date: 10.07.2023** | **Date: 10.07.2023** |

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