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|  | **VEDANTA LIMITED –**  **VALUE ADDED BUSINESS** | **Format No.:** | **FRMT/MR/10** |
| **INTEGRATED MANAGEMENT SYSTEM** | **Revision Date:** | **10.07.2023** |
| **HAZARD IDENTIFICATION** | **Revision No.:** | **03** |
| **Page No.:** | **1 of 1** |

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| **Departmental Use Only** | |
| **Revision No: 03** | **Unit: PID1** |
| **Revision Date: 10.07.2023** | **Dept.: Production** |

A. Work activity information

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| **Sr.No.** | **Details** | **Remark** |
| 1) | Task being carried out, their duration and Frequency: | Slag granulation &cleaning the pit  12 times in each furnace |
| 2) | Location (s) where the work is carried out. | BF granulation pit |
| 3) | Who normally/occasionally carried out the task? | Company employees & supervisors. |
| 4) | Who else may be affected by the work (For example visitors, subcontractors, the public) | Visitors |
| 5) | a) Has the personnel trained for performing the task  b) Any special training required | Yes  No |
| 6) | Is the written systems of work mandatory? If yes state, the procedure no. | VL/IMS/PID1/PROD/WI/08E |
| 7) | Is the work permit required for the task? | No |
| 8) | Plant and machinery that may be used:  Eg : crusher, conveyor, crane, heavy earthing equipment, Truck etc, | Slag granulation pumps & wheel loader |
| 9) | Any electrically operated hand tools are used | No |
| 10) | Manufacturers or supplier’s instructions for operation and maintenance plant machinery and powered hand tools are available or not: | Yes |
| 11) | Chain block, tools and shackles such as wire rope, hydraulic jack etc are used. | No |
| 12) | What materials are handled ?Size, shape, surface character and weight of materials that may be handled: | Hot slag & water |
| 13) | Is the material is required to be moved by hand. If yes Distance and heights of the place where materials have to move by hand. | NIL |
| 14) | Services used Eg: compressed air, oxygen, acetylene,  LPG gas, hydraulic oil, welding electrode for welding | Nil |
| 15) | Physical form of substances encountered during the work (For example fume, gas, vapour, liquid, dust/powder, solid): | Liquid hot slag & water |
| 16) | Content and recommendations of safety data sheets relating to substances used or encountered:  (This is applicable in case of chemical material) | NIL |
| 17) | a) Relevant acts, regulations and standards relating to the work being done, the plant and machinery used, and the materials used or encountered:  b) Is the activity is reviewed for compliance to statutory requirement | Factory Act  Motor vehicle act  Yes |
| 18) | What is the data (s) required to be monitored during the activity and the frequency of monitoring? | Nil |
| 19) | Any information available from within and outside the organization on incident, accident and ill health experience associated with the work being done, equipment and substances used: | Yes |

2. From the above activity information hazards are to be identified and recorded below using Appendix 'A' of SP/41

1. 30.12.2002 fatal accident: Mr. Pravin Sawant
2. 11.07.2003, Wheel loader operator met with hot water burn injury
3. 20.06.2004, hot water started coming in the pit while cleaning the slag pit
4. On 17.02.2011 at around 14.10hrs, slag grab crane operator went to operate BF-2 5T slag grab crane from control cabin. He got a mild feel of shock to his fingers while operating the crane from the control desk. Then he stopped operating the crane immediately & reported about the same to production area in-charge
5. On 19-06-2014 When cast opened at 03:00 hrs. Slag granulation started at 03:20 hrs. spark of hot slag flew and came in contact with green cloth which is above return water tank in the cast house & got burnt.

Root Cause: Improper granulation due to shortage of water.

Contributory Cause: • Inadequate roof sheeting in slag granulation area

Corrosion of vertical side plate on slag runner.

Corrective & Preventive Actions: • Proper granulation will be ensured by production

• Slag granulation hood will be enclosed all round with side sheeting

• Corroded plate will be replaced

1. On 28th May 15, At 3.15 pm it was observed that the hot water after slag granulation was overflowing from the pit into the walk way.It is suspected that the dam to prevent water overflowing from the pit was not made.

Causes: Dam to prevent water overflowing from the pit was not of sufficient height.

CAPA: Dam Height to be ensured for sufficient containment.

Granulated slag to be removed form pit regularly.

1. At around 00:15hrs while removing EL metal by HITACHI minor boiling occurred and metal fell on Hitachi glass. Due to this Hitachi glass broke and caught fire to spilled oil on HITACHI same was immediately extinguish by fire extinguisher. While taking HITACHI reverse slag pit hand railing was damage. No injury to operator.

Causes: Possibility of dampness of ground due to cooling of previous removed skull.

CAPA: 1. Training & Awareness to be given for operator working at EL removing metal by Hitachi to take additional precautions.

2.Cooling of removed skull may be slightly away from the EL Cleaning area.

1. On 28.03.2021 at around11:45 hr Mr. Sajjan Sawant and Mr. Suresh Chauhan (Vaman contractor) came in contact with hot water while inspection/cleaning of slag pit screens was going on, at Bf1 slag pit. Both were taken to dispensary, given first aid and resumed work.

Causes: Inadequate preparation before carrying out the activity of slag screen cleaning

Contributory causes /circumstances

Overflow of PCM re circulation water to S pond. S pond water used for SG and there by coating screens with lime.

CAPA: 1. Job to be carried out by draining complete hot water.

2. Control PCM re circulation tank overflow to S pond.

3. SGP pump LOTO to be taken during such activity

4. Valve hydraulic isolation to be done for entry into slag pit

5. One man one lock to be followed

6. Available SOP need to be elaborated further to include all the necessary details

7. Training to employees

1. On 11.11.2021 twice in A shift BF 2 slag pit found water overflowing from back side of slag pit and flowing through PCM 4 side hazards of person coming in contact with hot water while moving in the PCM 4 area as well as cleaning the below PCM. No injury to anybody.

Cause:1. Back side vertical plates got opened and hot water went outside and caused the damage to masonry wall build above the slag pit wall

2. Pit screens get jammed as ungranulated slag full evacuation is not happening within the limited time available between the cast

3. Present operating slag rate/water holding capacity of the pit is less

Contributory cause:

1. Poor effectiveness of back flushing of screens resulting in slag clogging in screen mess

CAPA:

a. Additional resource of 1 truck to be deployed to facilitate full evacuation of slag in time

b. Opening of wall & plated to attended immediately next shutdown

c. Additional high-pressure pumps to be installed for back flushing of screens

1. On 16.01.2022 at around 08:30 hrs, after closing the cast, Mr Anil kumar Rai (Vaman Engg) was inspecting the condition of slag pit screens through inspection window. While turning back his right ear bruised against the inspection window sheet leading to small cut on his right ear. He was sent to the dispensary from where he was referred to sankhali PHC for the treatment. He resumed to his normal duty after taking treatment from PHC.

CAUSES: The inspection window is for viewing the pit condition from outside itself and not peeping

into it by putting your head out.

Contributory causes /circumstances

No barrication to avoid person’s head from entering the inspection window

CAPA: 1. Rod barrication to avoid persons head entry through the inspection window.

2. Same barrication to be horizontally deployed in BF 2 slag pit window as well.

3.HIRA and SOP of the activity to be revisited

4.Retraining of workmen through PEP talk on Do's and Don’ts while carrying out such type of activity

**Hazards identified**

1. Fall of a person into the chamber
2. Contact with hot water
3. Contact with steam & fumes
4. Nonuse of PPE
5. Improper house keeping
6. Inadequate local lighting
7. Burns due to contact with hot water fumes.
8. Electric shock
9. Flying of hot slag due to improper granulation
10. Impaired vision due to glare of hot slag
11. Entry of hot metal in slagpit
12. Fall of person into the pit
13. Sharp edges of metal plates
14. Loader tyre burst during pit cleaning

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| **Prepared By:** | **Reviewed By:** |
| **Signature:** | **Signature:** |
| **Review Date: 10.07.2023** | **Review Date: 10.07.2023** |