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|  | **VEDANTA LIMITED –**  **VALUE ADDED BUSINESS** | **Format No.:** | **FRMT/MR/10** |
| **INTEGRATED MANAGEMENT SYSTEM** | **Revision Date:** | **04.04.2022** |
| **HAZARD IDENTIFICATION** | **Revision No.:** | **02** |
| **Page No.:** | **1 of 1** |

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| **Departmental Use Only** | |
| **Revision No: 03** | **Unit: PID-1** |
| **Revision Date: 10.12.22** | **Dept.: Mechanical** |

A. Work activity information

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| **Sr.No.** | **Details** | **Remark** |
| 1) | Task being carried out, their duration and Frequency: | Maintenance of Crane  8 hrs  Monthly |
| 2) | Location (s) where the work is carried out. | Hot metal Crane BF 1 & BF 2  25/12T crane, 12T magnet crane, 5T grab crane, 4T grab cranes at settling pond, ladle transfer car, Bf1 and BF2 slag pit, 25/12 T crane shed |
| 3) | Who normally/occasionally carried out the task | Engineer in charge  Work men on the job  Contractor workmen taken on labor supply |
| 4) | Who else may be affected by the work (For example visitors, subcontractors, the public) | Contractor workmen taken on labor supply  Electrical workmen’s |
| 5) | a)Has the personnel trained for performing the task  b) Any special training required | Yes (Past Experience)  No |
| 6) | Is the written systems of work mandatory. If yes state the procedure no. | [WI/MAINT/07](file:///C:/Users/00015547/AppData/Local/Microsoft/Windows/Temporary%20Internet%20Files/DIPESH/qehs/ohsas/departmental%20manual/11%20%20Work%20instruction/WIMAINT07%20MAINTENANCE%20OF%20HOT%20METAL%20CRANE.doc) |
| 7) | Is the work permit required for the task | Yes |
| 8) | Plant and machinery that may be used:  Eg : crusher, conveyor, crane, heavy earthing equipment, Truck etc, | Hydra, crane. |
| 9) | Any electrically operated hand tools are used | Grinder |
| 10) | Manufacturer’s or supplier’s instructions for operation and maintenance plant machinery and powered hand tools are available or not: | Nil |
| 11) | Chain block, tools and shackles such as wire rope, hydraulic jack etc are used. | 2T, 3T, 5T chain block and slings, D-shackles if required, Hydraulic jacks of suitable capacity. |
| 12) | What materials are handled? Size, shape, surface character and weight of materials that may be handled: | Irregular shape Mostly gear box and motor.  Approximately max 2 T |
| 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. | 2 kg by hand (tools & tackles)  2 mt height approximately |
| 14) | Services used Eg: compressed air, oxygen, acetylene,  LPG gas, hydraulic oil, welding electrode for welding | Compress air for cleaning motor  Welding machine |
| 15) | Physical form of substances encountered during the work (For example fume, gas, vapour, liquid, dust/powder, solid): | Solid, Fumes & dust |
| 16) | Content and recommendations of safety data sheets relating to substances used or encountered:  ( this is applicable in case of chemical material) | NA |
| 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 1948 & Goa factory rules 1998 – SRR/07  Hazardous waste  Yes |
| 18) | What is the data (s) required to be monitored during the activity and the frequency of monitoring. | Return of used oil |
| 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: | Incident on 11.03.04 (falling of material from crane)  Incident on 23.01.07 ( Rope came out from the Pulley)  Incident on 15.03.07 ( 12T hook of 25/12T crane fell down).  Incident 48/PROD/SEP/07 for snapping of wire rope of 25/12 T crane while lifting ladle  Incident 17/MECH/JUNE/08 for snapping of wire rope of magnet crane  Incident on 29.05.09( snapping of wire rope of magnet crane and magnet fell on pig near discharge end of pcm2)  Incident on 24.6.10( 10T got lowered and brake drum key was found missing)  Incident on 15.06.2015(snapping of 12T wire rope and pulley block falling down.)  Incident on 19.06.2015(12T pulley block nut hook came out slightly).  Incident On 15.06.2019 B-shift at 21:50 hrs Ladle No.9 was being taken out on ladle car for dumping in bag-house. On parked position while lifting the ladle by baghouse 25T crane, crane rope got snapped and ladle got lowered on ladle car. It got lowered on one of the stopper in tilted position. No one got injured and the whole area was barricaded.  On 12.08.2019 at around 10:10 hrs while electrical check list of EOT crane of screen building at PID2 was being carried out it was observed that the 5Ton hook was lowering automatically & did not stop even after hoist button was applied & also the fuse from the remote was removed. The whole wire rope got unwound after the hook touched the ground & started hoisting again.Later the operation had to be stopped from the control panel by switching off the power supply.No injury or damage.    A serious near miss incident took place on 12.11.19 at 9.20 hrs at ZRP plant. while charging of casting skimmed material into Liquation furnace with the help of F/C hoist of capacity 3 T , its hook touched hoist drum as hoist limit switch did not worked properly, then suddenly liquation hoist rope broken and lifted material with hook fell into skip which was placed outside the liquation furnace for drossing purpose. Immediately work was stopped, & plant manager informed. No injury happened, no one was in line of fire. Further investigation is under progress.  On 25.02.2020 At around 01:30 hrs during dumping of ladle in baghouse 25t crane right arm came out of trunion thus bending of left arm. Mr Sameer Gauns was the Baghouse crane Operator. He told during the dumping operation he was about to tilt the ladle 25t crane suddenly lowered, resulting in this incident.  On 22.05.2020 at around 12:15 hrs, a grating of 25/12 bag house crane fell below on ground in front of PCM#4. No person was standing near-by. Mechanical was immediately informed to replace the grating. |

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

**Mechanical hazard**

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| 1. Fall of person from height. |
| 1. Fall of person in hot water. |
| 1. Slipping of person in graphite or grease. |
| 1. Trapping of person during the fall of material from crane height. |
| 1. Trapping of person between crane wheel/ structure and rail. |
| 1. Trapping of person between the HIAB basket and the crab. |
| 1. Trapping of hand between the brake assembly gap. |
| 1. Hitting/trapping of person between two cranes or between crane and structure. |
| 1. Hitting of person by crane while moving ( standing on crane or while standing in walkway). |
| 1. Trapping of hand/ other part of body while handling the material or equipment. |
| 1. Hitting/ trapping of person by material being lifted by external crane/ hydra. |
| 1. Hitting of ladle or hook while shifting / crane moving. |
| 1. Fall of material from top. |
| 1. Fall of spanners, tools, plate, angles, open wire rope while lifting rope, steel etc. |
| 1. Fall of equipment like gearbox, motor etc. while installation. |
| 1. Failure of wire rope/sling while lifting wire rope, gearbox, motor, steel etc. |
| 1. Failure of wire rope/ hook of external crane/ Hydra used for material/ equipment erection. |
| 1. Failure of lifting machines, handling machines such as chain pulley block, sling, D shackle etc. |
| 1. Back Pain due to sudden or heavy load like gear boxes, drums & motors etc. |
| 1. Non use of PPE’s while carrying out the activity. |
| 1. Alcoholism. |
| 1. Trapping. |
| 1. Failure of crane hook and hook coming out due to lock plate failure or loosening. |
| 1. Structural failure in crane. |
| 1. Hitting of moving machineries like crane, truck, wheel loader etc while reversing or taking forward |
| 1. Failure of brake, gear & couplings. 2. Failure EOT crane wire rope |
| 1. Impact of other moving EOT cranes which are in operation on the crane under maintenance |
| 1. Slip or fall or any accidents on account of poor visibility due to steam from mould cooling or slag granulation |
| 1. Fall or slip of crane while jacking |
| 1. Incident due to improper identification of cranes or drives |
| 1. Fall of person through the gate provided for entering into crane |
| 1. Accident due to improper operation or wrong signaling |
| 1. Accident due to faulty operation of remote. |
| 1. Accident due to operation from other operating points |
| 1. Trapping of fingers in brake |
| 1. Trapping of fingers between rope and rope drum |
| 1. Failure of manila rope used for lifting the wire rope |
| 1. Fall of wire rope while lifting the wire rope or nay other items due to improper tying or negligence of person holding it |
| 1. Fall of person while checking the tension of 50T rope of BF2 HMC |
| 1. Failure of jack |
| 1. Fall of Gate from moving crane |
| 1. Slipping of brake drum/coupling due to missing key 2. Ladder for climbing on HMC hitting person standing on the CT walkway while CT operation is done. 3. Impact of bag house doors, ladle, ladle hammer. 4. Fall in ladle pit. 5. Impact of other moving machineries like wheel loader, back hoe, trucks. 6. Trapping in between hydra / crane. 7. Failure of D shackles, slings. 8. Impact of moving / slinged items. 9. Slipping of sling for hook due to absence of latch/ faulty latc 10. Failure of crane hook |
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| **Physical Hazard** |
| 1. Fire. |
| 1. Graphite and dust falling in eyes. |
| 1. Exposure to hot metal/slag splatters. |
| 1. Exposure of person to hot slag granulation water. |
| 1. Exposure to slag granulation or PCM fumes. |
| 1. Hitting of bearing pieces. |
| 1. Impact of chips in eyes or any body part while working near PCM area |
| 1. Burn injury from hot metal splashing or spillage |
| 1. Explosion of hot metal |
| 1. Fire of Cardium compound   **Human behavior:**   * Non usage of PPE’s * Person working under the influence of alcohol. * Person by passing work instruction. * Horseplay   **Chemical hazard** : Co gas poisoning |
| **Electrical Hazard** |
| 1. Electrical shock. |
| 1. Electric shock due to DSL bars. |

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| **Prepared By: Pradhul** | **Reviewed By: Bala Joshi** |
| **Signature:** | **Signature:** |
| **Date:10.12.2022** | **Date:10.12.2022** |