**Work Instructions for Monitoring of PID I Ladle for maximize the ladle heats**

**Criteria:** Safe Operating practices

**Responsibility:** Hot Metal Area Incharge, Shift supervisor, PCM supervisor

**Mechanical**

1. Fall of castable, steel, hammer, etc on human body.
2. Trapping in between objects.
3. Impact due to object
4. Snapping of wire rope of slings
5. Splashing of castable, mortar into eyes
6. Tripping of person
7. Cut due to sharp object
8. Tripping due to poor house keeping
9. Slip/Trip/Fall of a person
10. Fall of object
11. Contact with hot surface
12. Laddle puncture
13. Molten Metal eruption due to spillage on ground
14. Fire due to splashing of metal

**Physical**

1. Temperature.
2. Noise
3. Dust inhalation
4. Darkness

**Electrical**

* 1. Electrical shock from punctured cable.

**Behavioral Hazard:**

1. Workmen under influence of alcohol
2. Violation of procedure
3. Not wearing PPE’s
4. Not concentrating while working

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**Procedure:**

1. Unauthorized operation or repair of any equipment is a punishable offence.
2. Use all the personal protecting equipment (safety helmet, shoes, hand gloves, safety goggles, dust mask etc.) during the ladle monitoring.
3. Newly lined/repaired ladles are to be visually inspected for any wear out/damage of the refractory after every dump. Every time after cleaning by Hitachi/ excavator breaker/ hook, ladle inside refractory condition to be checked by user for any damage. If any damage found same to be highlighted to concern authority.
4. If any wear out/ damage is found in refractory wall, then ladle should be removed from the circulation.
5. Maximum allowable skin temperature at any point is 350°C. temperature to be noted immediately after pouring.
6. Skin temperature can be measured immediately after emptying ladle by laser gun.
7. After achieving the campaign life of 300 heats, Skin temperature for every 25 heats is to be recorded at predefined points on the ladle. MIS to be circulated to concern authorities. Also, inside condition for bricks fall, damage etc to check and noted by user.
8. Though Ladle shell temp is being monitored after completion of 350 heats below ladle trunnion the same needs to be monitored above trunnion for temperature uniformity on shell.
9. After achieving 500 heats usage of that ladle is to be stopped immediately and to be appraised to the concern authorities for further action.
10. If ladle is required to be used above 500 heats than it is to be discussed and joint inspection to be carried out by refractory engineer, Mechanical representative & Hot metal In-charge. During joint inspection no of heat to be increased above 500 heats to be decided.
11. After confirmation from the joint inspection team, before further usage of ladle same has to be informed to HOD- Prod & COO PID /Head PID.
12. If any mid-term repairing done, sufficient time (min 4 hrs.) to be given for setting of castable & mortar.
13. If mortar joints are opened/ eaten up, ladle is recommended to be removed from circulation.

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| **Prepared By:**  Head – Production PID I | **Reviewed & Issued By:**  Management Representative | **Approved By:**  Head – Production PID |
| **Signature:** | **Signature:** | **Signature:** |
| **Date: 15.07.2022** | **Date: 15.07.2022** | **Date: 15.07.2022** |

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| **Amendment Record** | | | |
| **Revision date** | **Manual Section ref. and para** | **Brief details of revision** | **New Revision No.** |
| 12.07.2021 | Procedure for monitoring of ladle for maximize the ladle debris | Point no 9-14 hazard included | 04 |
| 15.07.2022 | Procedure for monitoring of ladle for maximize the ladle debris | Change in format | 05 |