**WORK INSTRUCTIONS FOR B.F. BLOWING OUT OPERATION**

Responsibility: Deputy Head/HOD Production

Hazards Identified

* 1. BF Gas leakage
  2. Contact with hot metal, hot coke, dust, graphite, fire.
  3. Catch of fire for top charging system.
  4. Explosion inside the furnace due to water leakages. Gas Cleaning Systems
  5. Contact with fumes, hot water.
  6. Electric shock while operating the electric drilling Machine.
  7. Human behavior - Improper operation of the electric drilling Machine

Procedure:

                            Activity        Action by

1. Check all tuyeres and tuyere coolers for any water

leakage and remove PCI lances after taking shutdown by 10:00 hr : Prod    .

1. Start blowing out burden at 11:00 hrs. (Exact time will be decided by HOD) : Prod.
2. Ensure that all raw material bunkers and waiting  
    bin / weighing bins other than coke are fully  
    emptied before coke charging. : Prod,
3. Top gas temperature to be controlled by judicious  
    water spray at furnace top. : Prod.
4. Take gas sample for CO/ CO2 every 2 hours during   
    coke charging                                                                               : Prod.
5. Ensure steam in between bells at all times (5 Kg/ cm2) : Prod
6. Ensure that C.B.5 and hydro pack entrance to furnace  
    top is cordoned off : Mech.
7. Salamander hole drilling, to he carried out till a stable  
    temperature of 800’C is reached. Drill angle to be  
   maintained at 200. Drill machine to be removed  
    and runner to be heated, Make the runner and  
    sand bed ready for salamander tapping : Prod & Mech
8. All preference to be given to this furnace to avoid wind  
    reductions and ensure that each cast is hot and dry. : Prod,
9. Ensure full tap hole length. : Prod.
10. Ensure 20 bundles of oxygen lancing pipes (threaded)  
     and 3 Oxygen cylinders trolley with 2 hose connection ready  
     for salamander tapping. : Prod.
11. Keep one bag of dry pitch ready for salamander lancing. : Prod.
12. Ensure 4 sets of cast house safety appliances like aprons.  
     Goggles, hand gloves etc. : Prod.
13. When coke charging is over, open both bleeder valves and isolate gas cleaning system. (Water seal main line, saturator and HBS) : Prod.
14. Keep coke in both bells. : Prod
15. Ensure the steam in both uptakes. dust catcher and  
    between the bells (5 K /cm2) : Prod
16. Do not close the last cast. : Prod
17. Reduce wind volume and blast pressure to 0.05 Kgcm2 : Prod
18. Do not stop shell water. Clean of cast House area. : Prod
19. Ensure enough taphole operators (if required by keeping  
    on overtime)
20. Unauthorized operation or repair of any equipment is a punishable offence : Prod.

**BLOWING OUT SHUTDOWN**

        Activity Action by

1. Start salamander tapping as per instructions. : Prod.
2. Keep two blowers running during salamander tapping   
   (One each on grid and turbine/GEL). With positive pressure  
   of 0.05 Kg cm2 in furnace                                                                   : Prod.
3. Open steam fully in all points (Uptake, bells and dust  
   catcher). : Prod.
4. After salamander tapping. : Prod.  
   a) Empty both bells.  
   b) Keep one coke batch ready in coke weighing bin.  
   c) Take the shutdown as per work instructions.
5. Plug tightly all the tuyeres by plastic clay after inspecting water leakages.
6. Top firing to be done with both flanges on furnace top open. :Mech/Prod.
7. Inspect quenching spray fitting. Water spray should not get deflected towards the furnace shell as it may lead to uneven cooling which could lead to explosion.
8. Check top gas pressure transmitter from both uptakes. : Inst.
9. Stop shell water.
10. Blind flange to be put for dust catcher, main gas line. Flare stack and equalization line on furnace top. : Mech.
11. Remove all blowpipes and plug all tuyeres with special Plastic clay : Mech.
12. Dismantle drill machine mud gun : Mech.
13. Cleaning of all surrounding areas. : Prod./ Mech.
14. Open both bleeder valve fully. : Prod.
15. Cordon off cast house area and CB-5 hydro pack entrance to furnace top.
16. Keep one batch of coke (1500 Kg) in lower bell. : Prod.
17. Start quenching operation as per instructions.
18. Unauthorized operation or repair of any equipment is a punishable offence : Prod.

Quenching operation of the furnace

1. Unauthorized operation or repair of any equipment is a punishable offence.
2. Ensure Overhead cooling tower Make up pump ready for quenching operations with spare pump. Cooling tower basin level make up to be done by opening Over head Make up water valve from Cast house.
3. Start pumping water with 6 m3/ hr for 4 hours. Control the required flow of water by stopping the pump intermittently if required. Flow counter reading to be logged down every hour in log sheet. (i.e., 6 m3 water in one hour)
4. Controlled flow is a must and should never be unattended.
5. Increase water flow to 10 m3/ hr and maintain the rate till the copious quality of steam from the uptakes is noticed and increase the flow by 2 *m3/* hr in steps every 3 hours till 20m3/ hr is reached.
6. When the water comes to the tuyeres, increase water flow with steps of 5rn3/ hr every  
    hour till 30 m3 /hr is reached
7. Continue this operation till the water coming out of the taphole is at 500 *C.*
8. Maintain slight positive pressure by partial closure of one bleeder. Check top gas pressure.



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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: **15.07.2022** | Date: **15.07.2022** | Date: **15.07.2022** |

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