DALMIA CEMENT (B) LIMITED – DALMIAPURAM PRODUCTION DEPARTMENT			
Issue No. 02	**Rev. No: 01**	**Effective Date: 22.05.2015**	**SOP/PROD/21**
Issued By: S & P		**Approved By: Head – Production**	

SOP FOR GRIND CLINKER WITH GYPSUM, WITH OR WITHOUT POZZOLANA IN CVRM-II

SCOPE : GRIND CLINKER WITH GYPSUM, WITH OR WITHOUT POZZOLANA IN CVRM-II

RESPONSIBILITY : CCR executive.

Accountability : Section Head –CVRM-II.

PPE:

1. Safety goggles,
2. Safety helmet,
3. Safety shoe,
4. Mask,
5. Cotton Gloves.

TOOLS:

1. Poking bar,
2. Hammer.
3. Showel

Hazard:

Risks associated:	**Mitigating Measures**
Fall of tools;	Carry the tools in tool bags
Hit of Hammer in hand;	Trained to be engaged
Hit injury while poking	Hand gloves and no one near by while poking

Procedure:

1. Get clearance from the W/F M/A for clinker extraction from the clinker silo and feeding the same into the clinker hopper.
2. Get clearance from the M/A for Gypsum / Pozzolana feeding into their respective hoppers.
3. Get clearance from the miller to start cement grinding and transport the same into cement silo as per W/I.

4. Depending upon silo level & type of cement to be ground, select silo, out of 15,16,17,18 silo and ensure cement discharge to the selected silo.
5. Depending upon the type of cement select the W/Fs to be run.
6. Get clearance from the electrical shift in-charge for starting CVRM B/F fan, mill and booster fan.
7. Start groups 51N for clinker extraction from silo and feed the clinker hopper.
8. Put 51N group in auto mode for automatic filling of clinker hopper.
9. Start group 52N Group for Gypsum / Pozzolana feeding into their respective hoppers.
10. Ensure compressor air pressure is OK.

- Ensure OP limits for all the ten puppet dampers are available.
- Start mill auxiliaries group.
- Ensure all the drives are running.
- Set the classifier shaft RPM at min 300 and ensure both master rollers 1,2 & 3 and slave rollers 1, 2 & 3 are lifted and the positions of all the master and slave rollers are OK.
- Check whether OP limits for any one of the silo compartments is available i.e. OP limits for 59NSG3 or 59NSG1 or 59NSG2 & 59NSG4 or 59NSG2 & 59NSG5 should be available.
- Start the cement silo in feed group.
- Ensure all the drives are running.
- Ensure dedusting B./ F fan 55NFN6 Damper is open.
- Ensure all the drives are running.
- Keep stack damper 100% open.
- Announce in the ‘PA’ system that the CVRM B/F fan and booster fan are going to be started.
- Start CVRM B/F fan with minimum speed.

- Increase B/F fan speed so as to create negative pressure at the mill inlet.
- Start booster fan 54NFN4 or hot air generator or both to heat-up the mill.
- If hot air generator is running open hot air damper 54NSH1 and check the chimney damper 54NFD1 gets closed to heat up the mill.
- Regulate the hot air volume by adjusting the booster fan speed.
- Ensure that the mill gets heated-up slowly or minimum 30 minutes to be taken for the mill outlet. Temp. to reach 70° C.
- Announce in the PA system that CVRM Mill is going to be started.
- Start the mill once the mill outlet temp. reaches 70° C.
- Ensure that mill LRs end position is reached within 60 secs.
- Adjust B/F fan speed so as to keep the mill air flow min 700 Km^3/hr for OPC & OPC 43S/53S and min. 680 Km^3/Hr for pozzolana grinding.
- Start the mill feed system when the mill outlet temp. reaches 90° C.
- Ensure all the drives are running.
- If required select the key “Grinding aid pump in” and start the grinding aid pump.
- Ensure that the master rollers are lowered after 35 secs. From the 53NBC2 belt material “Starvation healthy” signal.
- For OPC & OPC 43S/53S grinding, regulate and set the mill total feed around 160-320 T/Hr so as to maintain mill differential pressure between 250 – 600 mmWg.
- For PPC grinding regulate and set the total feed around 160 - 340 T/hr. to maintain mill DP between 350 -600
- While grinding PPC, use dry fly ash depending upon the availability and inform the Miller about using dry fly ash.
- Start K2N Group and set the required TPH in the controller.

- Adjust wet fly ash feed rate to maintain the lime as per quality control plan
- Stop the dry fly ash feeding, when the bin is empty or PPC grinding is stopped
- Lower the slave rollers after master rollers have started lowering.
- Position the slave rollers between 65 – 200 mm so that the rpm of the rollers get maintained between 2-20 rpm.
- Air volume balancing through the mill is controlled by adjusting the recirculation damper, stack damper, fresh air damper and B/F fan speed.
- Adjust the grinding pressure between 70 - 98 bar to control mill vibration, mill DP, Mill load and cement fineness.
- Adjust the classifier shaft rpm between 1000 - 1550 to control the cement fineness for OPC & OPC 43S/53S and PPC.
- If required to control the mill outlet temp. Below 110° C water spray can be made by selecting the "Water pump 54NWP1".
- Optimize the production by monitoring and controlling the operating parameters in the following range.

	For OPC & OPC 43S/53S	For PPC
- Mill feed rate	160-320 MT/HR	150 - 340 MT/HR.
- Mill DP	250 – 550 mm WG	350 – 550 mmWG
- Bag Filter inlet temp.	76 – 110°C	76 – 110°C
- Mill inlet Pr.	Min 50 mmWG	Min 50 mmWG
- Fan inlet Pr.	< 900 mmWG	< 800 mmWG
- Classifier RPM	1000 - 1550	1100 - 1550
- Mill total air vol.	Min 700 Km^3 / Hr	Min 680 Km^3/Hr
- Grinding Pressure	70 - 125 bar	70-125 bar
- Slave roller Position	50 – 180	50 – 180

- When the operating parameters deviate beyond above said range, take corrective actions to bring it back to the operating range.
- When the mill is running in stable condition put total air vol. Loop, mill DP loop, mill inlet pressure loop, and mill outlet temp. loop in Auto,.
- Inform testing lab about mill running.
- Maintain the parameters as per Quality control plan. Document No. KP13
- Ensure that the operating parameters are automatically logged in the system.
- Record the stop and start hrs. of the mill with reasons in stoppage report.

Shutting down the plant (CVRM-II)

- Take all loop controls in manual mode open fresh air damper 100% (54NLD5). If HAG is running stop Coal to HAG and close hot air damper (54NSH1).
- If Booster fan is running close booster fan inlet damper (45NLD4) and stop the fan.

- If mill is to be stopped for 1 – 2 Hrs. stop mill feed group; in case of long stoppage of the mill stop clinker A/F and other W/Fs first and then stop the mill feed group after ensuring the conveyors are empty.
- Wait till the master & slave rollers get lifted and stop the mill.
- Reduce B/F fan speed gradually and then stop the fan.
- Stop mill auxiliaries group.
- Stop cement transportation and silo infeed group after ensuring that they are empty.
- Inform electrical shift in-charge about mill stoppage.

Restarting the mill after tripping or after maintenance.

- Get the clearance from the maintenance dept.
- Get the clearance from the W/F M/A .
- Get clearance from the Gypsum / Pozzolana belt M/A.
- Get clearance from the Miller.
- Get clearance from the electrical Shift-in-charge.
- Start the plant as per the procedure.

HAG Operation:

- Get clearance from the CVRM miller for HAG light up and hot air generator
- Get clearance from FLS Coal miller for coal extraction from stand by coal Bin and ensure that the blower air line and fine coal transport line from any one of the coal bins are ok.
- Ensure that HAG panel ok, oil pressure and air pressure ok signals are coming.
- Start combustion and dilution air fans and oil pumps.
- Before lighting-up the HAG, ensure the following conditions are satisfied.
  a. 54NSH1 should be in closed condition.
  b. 54NFD1 should be in open position and

c. Mill Fan running or Mill running.

- After ensuring all the above conditions first give Oil firing start command.
- Check and ensure that the following sequence of automatic light up of HAG is carried out after 30 seconds of start command.

  a. Pilot valve on
  b. Flame on
  c. Main valve on and
  d. Pilot valve switches off when or air valve on indication appears.

- As main valve on indication comes, adjust the combustion air fan speed.
- Once the combustion chamber temperature reaches 600º C. Open 54NSH1 HAG outlet damper from standby Coal bin. Start coal feeding to HAG Group 54H.
- Regulate the RPM of 42NSC4 screw conveyor.
- Maintain the combustion chamber temperature below 975º C by regulating coal screw conveyor RPM, combustion air fan and dilution air fan speed.
- Stop the oil firing once HAG is stabilized.
- For safety reasons the following conditions are to be satisfied for closing stack damper 561 SH9.

  a. Mill should be running.
  b. Mill fan should be running.
  c. Material feed on
  d. 54NSH1 (HAG O/L damper) in open condition
  e. B/F inlet temperature < 120º C
  f. Flame on indication and
  g. All HAG drives should be running.

- If flame on indication is not coming ensure that the fine coal feeding screw conveyor trips immediately and stack damper also opens simultaneously.
- Always ensure that the fire fighting equipment is available in conditions at the HAG site.

Stopping the HAG:

- Stop the fine coal feeding Group 54H.

- Stop the coal feeding screw pump after emptying.
- Close the HAG outlet damper 54N SH1.
- Ensure the stack damper is open.
- Run the combustion and dilution air fans till the HAG chamber temperature dips below 300º C.
- Stop the combustion and dilution fans.
- Empty the ash in HAG hopper manually.

To Transport Dry Fly Ash from Dry Fly Ash Silo or from Dry Fly Ash Dump Hopper to CVRM-II Dry Fly Ash Storage Bin :

- Get clearance from Silo Machinery Attendant for extraction of Dry Fly Ash from Dry Fly Ash Silo to CVRM Dry Fly Ash Storage Bin.
- Give selection accordingly to transport from Dry fly ash silo or from Dry fly ash dump hopper.
- Start Group K2N for extraction of Dry Fly Ash from Dry Fly Ash Silo and ensure all the drives are running.
- Then start the Dry Fly Ash to CVRM Dry Fly Ash Bin and monitor operation of the system.

Stopping Transport of Dry Fly Ash from Silo to CVRM Dry Fly Ash Bin :

- Stop Group K2N and ensure that all the drives stopped.
- Before stopping ensure that the system is empty.

Job Safety Analysis	Job: Cement grinding in CVRM-II	Date: 01 – 09 - 2013	Analysis by: Section Incharge	Reviewed by: Section Head
Title of employee doing job:	Supervisor: Sec.Incharge	Department: Production	Section: CVRM-II	Approved by: Department Head
Req'd/recommended PPE:				
Sequence of Basic	**Potential Hazards**	**Recommended**	**What Could Go**	**Corrective Action**

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Job Steps		Safe Job Procedure	Wrong	
Cleaning of the Chute	pipe hit to the person	Hold the Pipe properly, if there any possible tie it one end.	Pipe may hit the person while cleaning the chute.	Hazards to be explain to the people who are working in that area by safety PP talk, tool box talk.
Inspecting the chute	Fall of the person	While inspecting the chute use safety belt and make proper approach to view the chute.	Person may fall on to the chute due to slip.	Use Proper safety belt to inspect the chute.
Cleaning spillage in aumond conveyor bottom	Showel may entrapped into conveyor	Ensure showel should not touch the conveyor while cleaning	Person may entrapped into conveyor if he hold strongly	Stop the conveyor and start the conveyor after clean the spillage material
Light up the HAG	Coal may flush	Ensure all doors are closed	Coal may leak because of pressurization	Maintain draft of -25 mmWC to avoid pressurization

Emergency Shut- off:

1. In case of belt is moving, Emergency pull chord switch should be activated by the person.
2. If body injury is there, First aid will be given and inform to the Safety department or Call Emergency number 233/555/9865125176/9865177444.

Records/Annexure:

1. Refer Line clearance certificates.
2. JSA as enclosed below.

HOD PRODUCTION HOD TECHNICAL