

**LARA SUPER THERMAL POWER PROJECT
LOCATION MANAGEMENT INSTRUCTION**

LMI 12-R0/OPN/ COS-ISO-00-OGN/OPN/SYST/032



**OPERATING PROCEDURE TO BE FOLLOWED IN CASE OF EXCESS
ASH ACCUMMULATION INSIDE ESP HOPPERS**

All locations are required to comply with this Directive

Approved for Implementation by:

HOP (LARA)

Date: 06/8/18

Enquiries to : HOD(Operation)

NTPC	LMI	LARA
TITLE	OPERATING PROCEDURE TO BE FOLLOWED IN CASE OF EXCESS ASH ACCUMULATION INSIDE ESP HOPPERS	
REF. NO.	LMI 12-R0/OPN/ COS-ISO-00-OGN/OPN/SYST/032	

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OPERATING PROCEDURE TO BE FOLLOWED IN CASE OF EXCESS ASH ACCUMULATION INSIDE ESP HOPPERS

1.0 INTRODUCTION

In thermal power plants, ash is generated continuously after firing of coal. It is collected in boiler bottom ash hopper, Economizer hoppers, APH & ESP hoppers. Bottom & ECO hoppers ash is handled by slurry system and APH & ESP hoppers ash are either handled by slurry system or by pneumatic conveying system. These different locations ash are evacuated/removed either continuously or intermittently depending upon the hoppers' capacity and ash removal system design. Each ESP hopper storage capacity of minimum 8 hrs. ash corresponds to minimum 68% ash collection rate in the first field. Though, in normal condition, 1st field hoppers collect 70-75% of ESP ash, 2nd field hoppers-18%, 3rd field hoppers-7% and so on reduced gradually, for smooth & safe O&M of the system as well as unit, all hoppers emptiness is ensured in every shift.

This LMI identifies the need to exercise great care to **avoid excess ash accumulation in the ESP hoppers which results in damage of ESP internals & structures**. The LMI also covers safe operation, isolation of ESP pass/passages and unit shutdown to avoid major damage and long outage.

2.0 REFERENCE DOCUMENT:

- a. COS-ISO-00-OGN/OPN/SYST/032, Rev. No.: 1 December 2017
- b. Ash distribution data in various fields of ESP hopper (9548-104-PVM-U-002-02)
- c. ESP sizing calculation (9548-104-PVM-U-001)

3.0 SUPERSEDED DOCUMENTS: NIL

4.0 SCOPE

This LMI applies to Boiler of NTPC, Lara stage 1 ,Units (2x800 MW) with collection of ash in ESP hoppers and removal of the same continuously or intermittently by pneumatic conveying system.

5.0 RECOMMENDATIONS

Due to hopper choking and poor ash evacuation rate from ESP hoppers, ash accumulation in the hoppers take place. Excess ash accumulation leads to ESP internals damage and collapses of ESP structure. To prevent such incident, below mentioned operating procedure is to be followed:

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(i) ESP field healthiness monitoring mechanism

- Record of ESP pass evacuation is maintained in Ash handling control room, UCE & SCE engineer logbook.
- ESP field parameter monitoring is done through IOS panel placed in control room in every shift.
- In case of any fault in ESP hopper evacuation system, concerned maintenance people informed and notification raise in SAP.
- Emptiness of ESP hopper ensured from local in case of doubt.

Responsibility: SCE/UCE/Control engr. (Oprn)

(ii) ESP hoppers are provided with ash level high indicators (ALI) and they are commissioned prior to ESP Pass charging and joint protocol by Operation / Electrical / C&I / AHP Maintenance is prepared.

Responsibility: AGM(OPRN/EMD/AHM/C&I)

(iii) Each field has two hoppers, a separate ALI switch provided in each hopper for ALI. Whenever ash level becomes hi in any hopper, ALI alarm appears in ESP field. When ash level becomes hi-hi, ALI-Trip is generated and ESP field gets tripped. Mimic in ash handling unit & indicator at local shows in which hopper ALI is appearing. Immediate action taken to evacuate hopper in this condition on priority basis.

Responsibility: Control Engr (Oprn)

Monitoring of healthiness of ALI switches is to be checked on weekly basis by physical inspection jointly with C & I.

Following lamps/LED should glow in ALI switches at local

- ✓ Power supply healthy indication
- ✓ Ash level hi/low alarm indication (& in DCS mimic also)
- ✓ Probe healthy indication
- ✓ Switch is not damaged physically, wiring is intact and no dust accumulation on it.

Responsibility: Control Engr (Oprn)/AGM(C&I)

If field not does not trip on ALI hi-hi protection, Notification is to raised to EMD and field is to be taken out of service till rectification of problem.

Responsibility: Control Engr (Oprn)/AGM(EMD)

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- (iv) Whenever ALI-Trip (Ash level HI-HI trip) appears in any fields of a pass or under-voltage appears in same hopper not emptied in a shift, it implies that there is poor evacuation of accumulated ash.

Following action is taken in this case

- Identify filled ESP hopper.
- Check locally if hopper is filled. In case of false ALI inform C & I.
- Corresponding ESP hopper evacuation started on immediate basis.
- If necessary, poking is to be done taking necessary precautions.
- Switch off the corresponding rapping motors when hoppers are over filled

Responsibility: Control Engr (Oprn)

- (v) If it appears that hopper is choked and not getting clear from poking, PTW issued to maintenance for clearing hopper after necessary isolation as per PTW requirement.

Responsibility: Control Engr(Oprn/AHP)

- (vi) When 6 ESP passes in service, if there are 3 no. of ALI trip in particular ESP pass the corresponding ESP pass may be isolated immediately from Flue gas side to ensure safety of ESP internals and structures. Evacuation of pass will continue till all hopper emptiness is ensured. After that pass can be taken in service.

Responsibility: UCE/Desk engr(Oprn)

- (vii) If the similar ALI high condition/field tripping (as mentioned above) appears in any other pass of the unit, in this case load reduction to be done proportionately to reduce ash loading in ESP. (If 5 ESP passes in service, in this case isolating this pass will cause tripping of one of ID/FD fan).

Responsibility: Control Engr (Oprn/AHP)

- (viii) Load on the unit may be reduced proportionately after each ESP pass isolation if required (as in case of coal quality deterioration)

Responsibility: SCE

- (ix) The isolated ESP pass may be put back in service only after ensuring the ash evacuation system healthiness, emptying of all hoppers of the pass through physical inspection of all the fields and restoration of the fields in all respects.

Responsibility: UCE/Control Engr(Oprn)

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- (x) After isolation of two passes in case of four pass ESP or three pass in six pass ESP, if the problem of any ESP ash evacuation still persists (ALI is showing Hi for more than 8 hours), i.e. all charged ESP hoppers are not getting evacuated through the system envisaged in every shift, Boiler is to be taken under shutdown for complete evacuation of ESP ash.

Responsibility: SCE

6.0 REVIEW

The HOD(O & M) shall be responsible for review of this document on a 2 yearly basis or as necessary.

7.0 DISTRIBUTION LIST

SL NO.	DATE OF ISSUE	ISSUED TO
		HOP (LARA)
		GM (O&M)
		GM (Maint.)
		AGM (OPERATION)
		AGM (MM-AHP)
		AGM(EMD)
		AGM(C & I)
		INTRANET NTPC LARA

8.0 LMI REVIEW RECORDS

Sl. No.	Date	Reviewed By	Signature	Comments

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LOCATION MANAGEMENT INSTRUCTION
LMI 12-R0/OPN/ COS-ISO-00-OGN/OPN/SYST/032
**Operating procedure to be followed in case of excess ash
accumulation inside ESP hoppers**

Issue Date: 30.07.2018/Rev: 0

CHECKLIST

S.NO.	Check points	Department	Compliance status/Remark	Remarks
1	Are ALIs commissioned before ESP pass charging.	OPRN/C & I/EMD/AHM		
2	Is checking of ALI is done on weekly basis	OPRN/C & I		
3	Is healthiness of ESP field is monitored	OPRN		
4	Is PTW issued to Ash handling maintenance if hopper not getting evacuated.	OPRN/AHM		
5	If there is more than 3 ALI trip of ESP filed, pass is isolated from gas side.	OPRN		
6	If 5 ESP pass in service and if there is more than 3 ALI in other ESP pass load to be reduced proportionality?	OPRN		
7	If ALI alarms not appearing notification raised.	OPRN		
8	If ALI is hi-hi & field not tripped, notification is raised to EMD. Such field is not charged till problem is rectified.	OPRN/EMD		
9	Is in case of any fault in ESP hopper evacuation system, concerned maintenance people informed and notification raise in SAP?	OPRN		
10	Is emptiness of ESP hopper ensured from local in case of doubt?	OPRN		
11	After isolation of two passes in case of four pass ESP or three pass in six pass ESP, if the problem of any ESP ash evacuation still persists (ALI is showing Hi for more than 8 hours), i.e. all charged ESP hoppers are not getting evacuated through the system envisaged in every shift, Is Boiler is to be taken under shutdown for complete evacuation?	OPRN		
12	Is necessary precautions is taken during poking	OPRN		
13	Is when hoppers are over filled, the corresponding rapping motors switched off.	OPRN		
14	Is record of ESP hopper evacuation is maintained by Ash handling control room, UCE and SCE	OPRN		
15	Is necessary precautions are taken if hopper poking is required.	OPRN		

AKASH

DOs & DON'Ts

Issue Date: 30.07.2018/Rev: 0

Dos

- Record of ESP pass evacuation is maintained in Ash handling control room, UCE & SCE engineer logbook.
- ESP field parameter monitoring is done through IOS panel placed in control room in every shift.
- In case of any fault in ESP hopper evacuation system, concerned maintenance people informed and notification raise in SAP.
- Emptiness of ESP hopper ensured from local in case of doubt.
- ALI switches to be commissioned prior to ESP Pass charging and joint protocol by Operation / Electrical / C&I / AHP Maintenance is prepared
- Weekly check ALI healthiness jointly with C & I (local switch & in DCS)
- Take immediate action evacuate hopper if ALI hi alarm appears.
- Whenever ALI-Trip (Ash level HI-HI trip) appears. Following action is taken in this case
 - Identify filled ESP hopper.
 - Check locally if hopper is filled. In case of false ALI inform C & I.
 - Corresponding ESP hopper evacuation started on immediate basis.
 - If necessary, poking is to be done taking necessary precautions.
 - Switch off the corresponding rapping motors when hoppers are over filled
- If it appears that hopper is choked and not getting clear from poking, issue PTW to maintenance for clearing hopper after necessary isolation as per PTW requirement.
- When 6 ESP passes in service, if there are 3 no. of ALI trip in particular ESP pass the corresponding ESP pass may be isolated immediately from Flue gas side to ensure safety of ESP internals and structures. Evacuation of pass will continue till all hopper emptiness is ensured. After that pass can be taken in service.
- If the similar ALI high condition/field tripping (as mentioned above) appears in any other pass of the unit, in this case load reduction to be done proportionately to reduce ash loading in ESP. (If 5 ESP passes in service, in this case isolating this pass will cause tripping of one of ID/FD fan).
- Load on the unit may be reduced proportionately after each ESP pass isolation if required (as in case of coal quality deterioration)
- The isolated ESP pass may be put back in service only after ensuring the ash evacuation system healthiness, emptying of all hoppers of the pass through physical inspection of all the fields and restoration of the fields in all respects.
- After isolation of two passes in case of four pass ESP or three pass in six pass ESP, if the problem of any ESP ash evacuation still persists (ALI is showing Hi for more than 8 hours), i.e. all charged ESP hoppers are not getting evacuated through the system envisaged in every shift, Boiler is to be taken under shutdown for complete evacuation of ESP ash.

DON'Ts

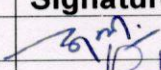
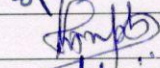
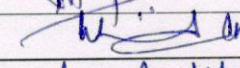
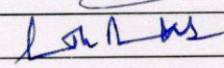
- Do not bypass any procedure & protection.
- Do not overlook ALI alarms.
- Do not run unit in full load if problem of ESP evacuation increasing.
- Do not put back defective ESP pass in service.
- DO not stop hopper evacuation system if not required.
- Do not charge ESP field if ALI is defective.
- Do not charge ESP field if not tripping on ALI hi hi protection trip.

AKasturkar

Dear Sirs,

As per operation directive and operation guidance note issued by corporate OS following LMIs has been prepared.

May please review/suggest changes if any and put your signature for concurrence.

LMI 12-R0/OPN/ COS-ISO-00-OGN/OPN/SYST/032 Operating procedure to be followed in case of excess ash accumulation inside ESP hoppers		
SL NO.		Signature
1	AGM (OPERATION)	
2	AGM (AHP)	
3	AGM (C & I)	
4	AGM (EMD)	

Regards



Alok Kastwar

Sr.Manager (Operation)