Coal Plant Combustion Residue

Issues and Challenges

O&M Issues

- Fast wear and tear of the plant and equipment.
- Availability of right material at right time.
- Availability of trained manpower.
- Problem in vacuum system leading to backlog in ESP.
- Problem in pressure conveying- again leading to backlog.
- What can be measured only that can be monitored.

O&M Issues

- Bottom Ash System

  -Pressure at inlet of jet pumps: Pump condition, line leakages, parallel valve passing.

  -Clinker Grinder roll healthiness: Worn out teeth, sealing water.

  -BA Slurry line pressurization

  -Slurry line leakages

  -Clinker formation

Fly Ash System Issues

- Reduction in conveying capacity: Coarse ash carry over.
- Slow or no APH evacuation : Long equivalent length-Loop, multiple bends.
- Less net vacuum at ESP hopper outlet: DP Across bag filters.
- Choking of ESP hopper mouth.
- Air ingress in vacuum pipe : coupling leakage, side plate leakage , passing if MHV.
- Air ingress in buffer hopper.
- Deterioration in capability of vacuum pump: low shut off vacuum.
- Non emptying of buffer hopper: Fluidizing, PE valve functioning.
- Pressurization of FATLs.

ECO Flushing Apparatus: Improper evacuation

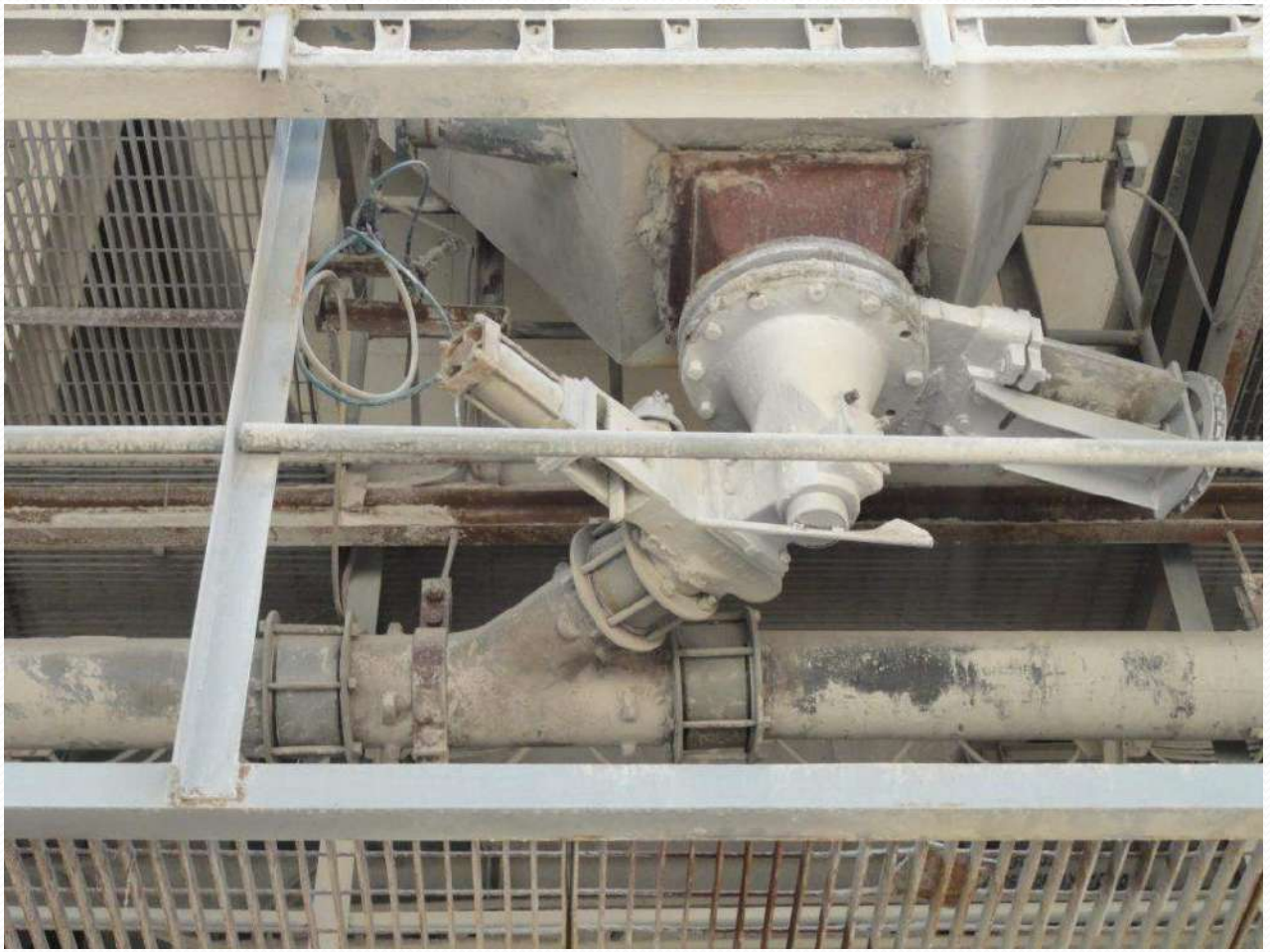
- Placed at two different elevation (17 mtr & 32 mtr).
- Now brought to same level at 17 mtr. Through a sleeve in hot PA duct
- Water supply line diameter was less (25 NB) . Now 32 NB line provided.
- All the KGV are now 100% open

APH Line Modification: Loops & bends in line causing difficulty in APH evacuation

APH line Modification: Lines directly connected to buffer hoppers with individual valves.

Platform for monitoring & Maint. of line & MHV

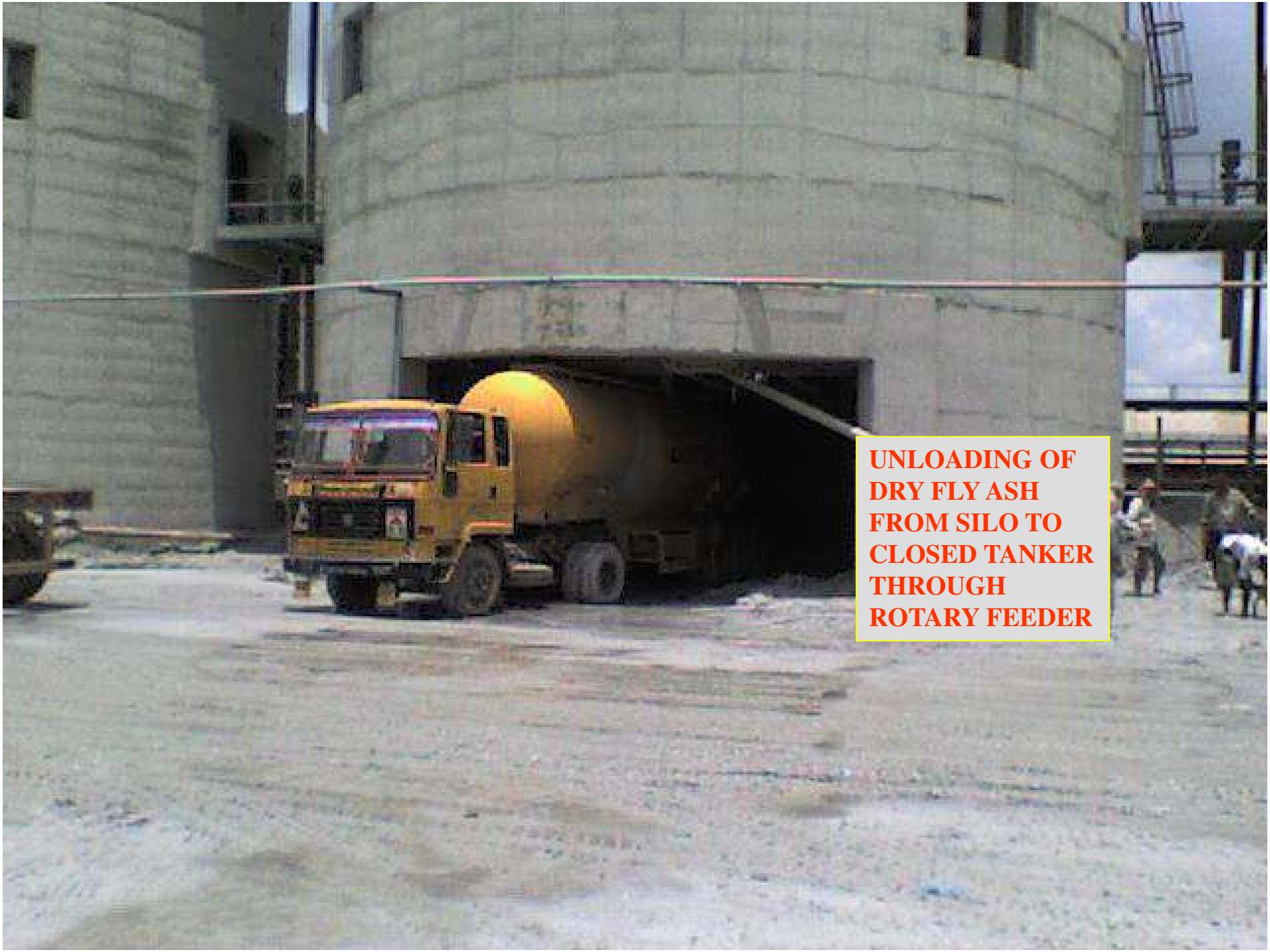
Air Ingress Points : Choking of Hopper Mouth & Loss of Vacuum



Shut off Vacuum of Buffer Hopper: by continuous monitoring system healthiness is ensured.

Change in Metallurgy of vacuum pump cone to SS-410.

Ash pipe to Silo : Stepping points changed.


UNLOADING OF
DRY FLY ASH
FROM SILO TO
CLOSED TANKER
THROUGH
ROTARY FEEDER


Field Conveyors

Ash Disposal spreader

Improvement in Metallurgy of Rotary Seg. Valve & Seat from CI to White cast iron -600 BHN hardness: life has been increased, no loss of TAC air and filling of buffer hopper.

Improved material ASTM A532 Gr.III with hardness >500 BHN .

Filling of Buffer Hopper :Proper Fluidizing , fluidizing air changed from TAC air to Instrument air with in line pressure regulator.

Filling of Buffer Hopper: PE valve not functioning properly, reciprocating design valve provided.

FATL Pressurization: Loop in the line, more bends and improper stepping of pipe modified.

Provision of cross over valves done: otherwise passing may cause choking of standby lines at downstream .

Bottom Ash System Issues

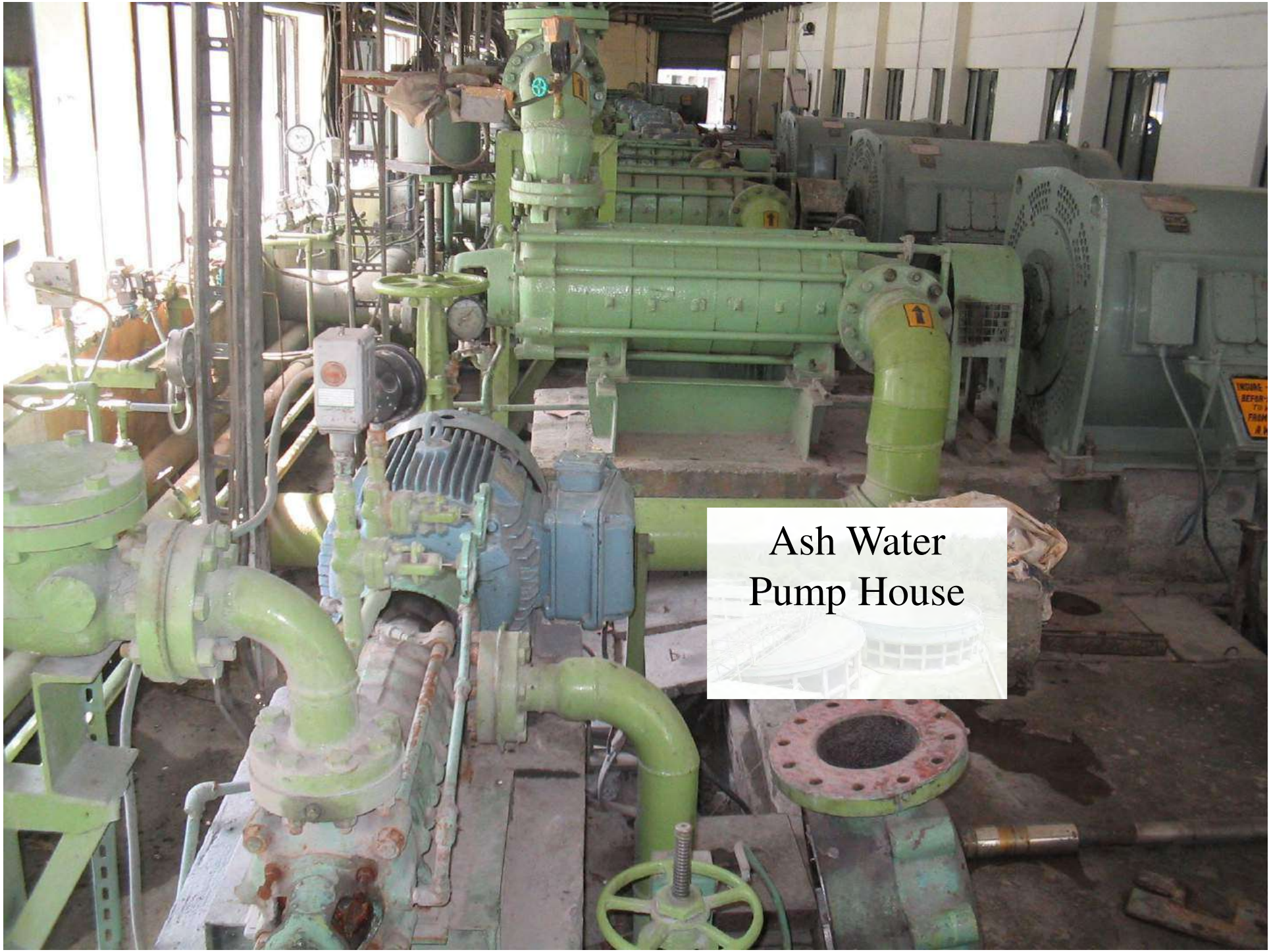
- Long evacuation time : Low HP Pressure.
- Choking of bottom ash discharge line.
- Leakages in Bottom ash line: Line routing
- Ash Carryover from Hydrobins.
- Wear and tear of HP/LP pumps

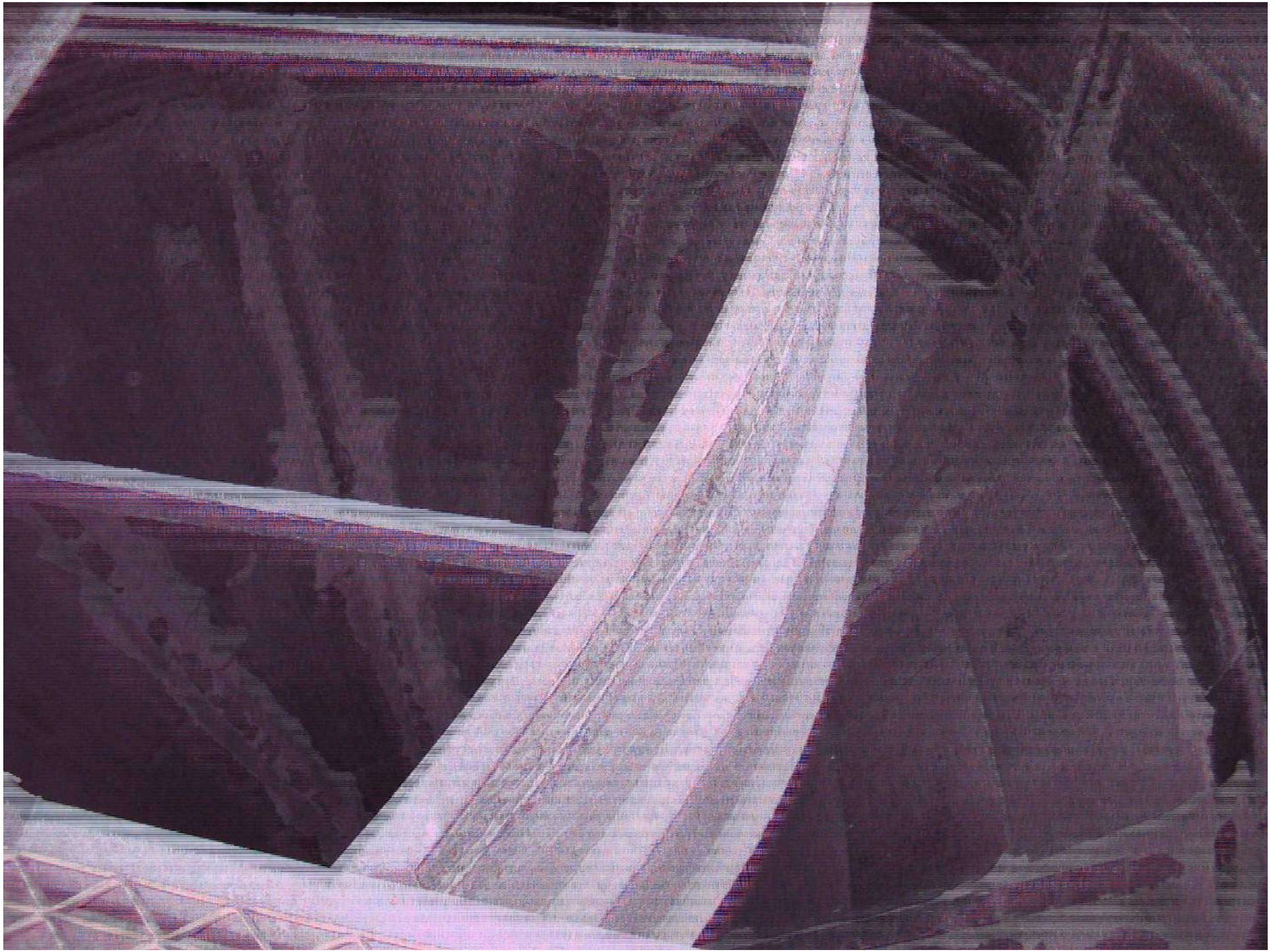
Bottom ash discharge line: More flexibility

- Front hydro-ejector discharge merged in one and similarly the rear one.
- Now separate line has been laid resulting in more operational flexibility.

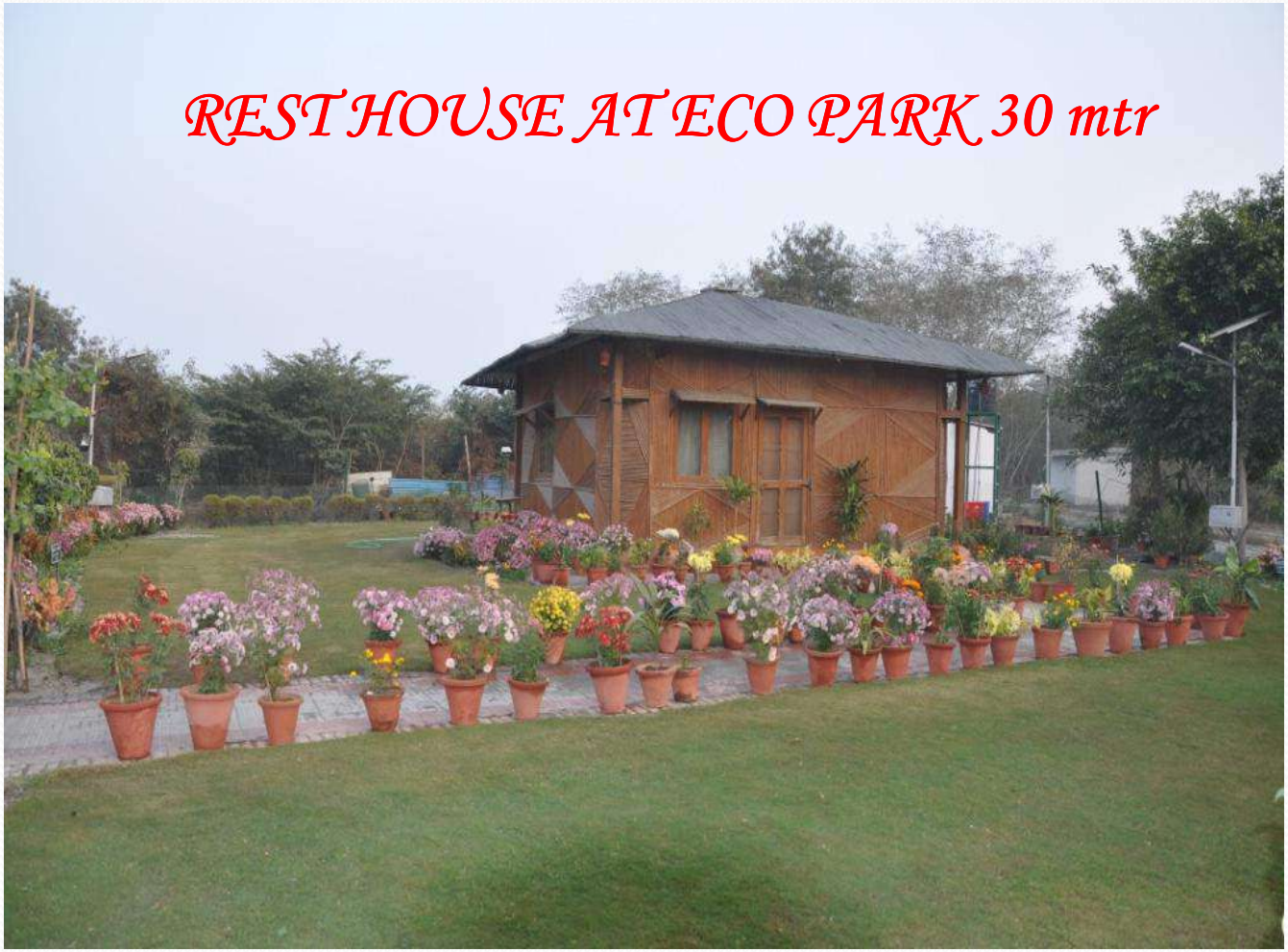
BA slurry line inside trench: Difficult to attend leakage

- Cast basal line with sleeve coupling routed in trench.
- Leakage causing filling of trench (1.2 mtr) /culvert (3.0 mtr) with ash making it very-very difficult for repair. MS line over the ground provided.


Ash Water
Pump House



REST HOUSE AT ECO PARK 30 mtr



Considerations for Dry Ash Disposal System

- Coal quality : calorific value & Ash percentage
- Ash utilization
- Rainfall
- Water availability
- Land availability
- Capital expenditure
- Maintenance cost

Issues & Challenges in Ash Disposal

- Storage of Dry Fly Ash & Bottom Ash for utilization.
- Quality of fly ash and bottom ash: Graded Fly Ash
- Sufficient off-take of fly ash from storage area.
- Long term agreement with users.
- Market for ash utilization.
- Movement of vehicles inside plant and fugitive dust.
- Land for dyke and water recirculation.

Future Plans

- Increasing of redundancy in pressure conveying system and operation of both buffer hoppers of one pass.
- Changing of ACI pipe by Cast basalt pipes in stage-I units.
- Reclamation of vacuum pump casing and side cover with removable wear plates.

Conclusion

- Low ECO foot print of our ash handling system due to less use of water and land.
- No water and air pollution.
- Ash as a resource material instead of waste : difficult to dispose.

Thanks

Operational Parameter

AHP HEALTHINESS REPORT FOR DATE 02/11/2015

UNIT-5

	A Pass					B Pass				C Pass				D Pass				
B/H in service																		
Vacuum Pump i/s																		
B/H Vacuum*																		
Bag Filter DP																		
Dust Sensor																		
Cycle Time(min)																		
	APH	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	APH
Orifice Size																		
Header Vacuum																		

UNIT-6

	A Pass					B Pass				C Pass				D Pass				
B/H in service	A1					B1				C2				D2				
Vacuum Pump i/s	A2					B2				C2				D2				
B/H Vacuum*	490					490				480				500				
Bag Filter DP	25					25				19				16				
Dust Sensor	NHI					NHI				NHI				NHI				
Cycle Time(min)	60					60				60				60				
	APH	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	APH
Orifice Size	50	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	50
Header Vacuum	240	200	205	200	210	195	200	200	205	190	190	190	195	200	195	190	190	245
Drier in service	5A			5B			5C			6A				6B		6C		
Dew Point(drier outlet)													N/W		N/W			
Instrument air pressure					5.85	interconnection valve position(o/c)							C					
IAC i/s	5A			5B				6A				6B						
1st St. Pressure	1.7							1.7				1.8						
Int. Cooler Air O/L temp.	36							42				40						
COOLING WATER PR.					2.69	COOLING WATER TEMP							27.23					

Hydro ejector		HP	Pr	AMP	SL Pp	Pr	AMP		5A	5B	5C	5D		6A	6B	6C	6D
Bottom Deashing Time	8.00 HR	A	8.9	160	B	5.0	275							60			60
	16.00HR	B	8.6	120	B	4.9	272								75	60	
	00.00HR	A	9.1	150	B	4.9	272							50			55

		A-SHIFT	B-SHIFT	C-SHIFT	TOTAL (IN HOURS)
ENERGY CONSERVATION	UNIT-5	SHUTDOWN	SHUTDOWN	SHUT DOWN	
	UNIT-6	2	2	4	8