Annex – 3
(Immediate measures without financial implication)

Measures Implemented

Functional Group	Sl. No.	CPRI Recommendation	REMARKS
P4	1	Ultrasonic level indicators for all fuel oil tanks	Oil stock & Oil consumption can be correctly monitored.
P-7	1	The software resources for online tendering and paperless process need to be upgraded.	Jan-09
P-8	1	Repair and check of hangers and supports	In U-3,4 & 5 Implemented during AOH/COH.
	2	Check the end termination temperatures for all joints	
	3	**'Zero steam leak tolerance'** declaration (Station)	Necessary steps are being taken.
	4	**Zero coal leak** policy may be incorporated to prevent loss of pulverized coal Unit-3	Necessary steps are being taken
	5	**Zero coal leak** policy may be incorporated to prevent loss of pulverized coalUnit-4	Necessary steps are being taken
	6	**Zero coal leak** policy may be incorporated to prevent loss of pulverized coal Unit-5	Necessary steps are being taken
	7	During overhaul all the gas flow guide vanes, direction vanes, diversion baffles are to be inspected. Materials of diversion baffles must use alloy steel with overlay of hard materials like silicon carbide or tungsten carbide for unit No 3	Work carried out during AOH/COH
	8	During overhaul all the gas flow guide vanes, direction vanes, diversion baffles are to be inspected. Materials of diversion baffles must use alloy steel with overlay of hard materials like silicon carbide or tungsten carbide for unit No 4	Work carried out during AOH/COH

	9	During overhaul all the gas flow guide vanes, direction vanes, diversion baffles are to be inspected. Materials of diversion baffles must use alloy steel with overlay of hard materials like silicon carbide or tungsten carbide for unit No 5	Work carried out during AOH/COH
	10	Chemical cleaning of boiler pressure part internals	cleaning is done in AOH/COH.
	12	Standard Calibration Equipment and Field Instrument Calibrators. For Unit- 3	Master equipment available.
	13	Standard Calibration Equipment and Field Instrument Calibrators. For Unit- 4	Master equipment available.
	14	Standard calibration equipment and field instrument calibrators For Unit- 5	Master equipment available.
P-10	1	100 % availability of boiler lifts for round the clock monitoring of the boiler elevations especially drum and pent house levels. are to be immediately repaired. (Unit 5)	
	2	Safety door on L & R sides of boiler at entrance of 2nd pass to prevent boiler over pressurization Unit-3	
	3	Safety door on L & R sides of boiler at entrance of 2nd pass to prevent boiler over pressurization Unit-4	
	4	Safety door on L & R sides of boiler at entrance of 2nd pass to prevent boiler over pressurization Unit-5	
	5	40 KVA UPS Supplying 230 VAC is required Unit-3	
	6	New protection switches for lube oil protection, furnace draft and vacuum.Unit-3	Existing Switches calibrated & Found OK.
	7	New protection switches for lube oil protection, furnace draft and vacuum.Unit-4	Existing Switches calibrated & Found OK.

	8	New Protection Switches for Lube Oil Protection, Furnace Draft and Vacuum. Unit-5	Existing Switches calibrated & Found OK.
	9	Re-design of reject gates of mills U-3	
	10	Re-design of reject gates of mills U-4	
	18	Additional Hydrastep for Drum Level Measurement Unit-5	Both available,
P.12	1	Digitization of the ISO 9001 QMS work instructions	
	2	Burner mouth panels to be replaced with upgraded materials	At present Burner mouth panels are checked during AOH /COH & replacement carried out.
	7	Burner mouth panels may be inspected during each outage and surface replenished periodic intervals. U-3 ,4 & 5.	Carried in AOH / COH of unit-3 , 4 & 5
P-13	1	Transformer management	To be implemented held up because of because of low payback period.
	2	Temperature sensors with indicators may be installed for energy monitoring of passing of high energy drains. Unit- 3	Monitoring carried out with portable laser gun.
	3	Temperature Sensors with Indicators may be installed for Energy Monitoring of passing of High Energy Drains. Unit-4	Monitoring carried out with portable laser gun.
	4	Temperature Sensors with Indicators may be installed for Energy Monitoring of passing of High Energy Drains. Unit-5	Monitoring carried out with portable laser gun.

	5	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm high grade material and insulation of the flue gas ducts may be replaced (need based depending on the deterioration) by new unbonded, felted, mineral/rock/slag wool mattresses.**(Unit- 3)**	Carried in AOH / COH of the Unit.
	6	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm high grade material and insulation of the flue gas ducts may be replaced (need based depending on the deterioration) by new unbonded, felted, mineral/rock/slag wool mattresses.**(Unit- 4)**	Carried in AOH / COH of the Unit.
	7	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm high grade material and insulation of the flue gas ducts may be replaced (need based depending on the deterioration) by new unbonded, felted, mineral/rock/slag wool mattresses.**(Unit- 5)**	Carried in AOH / COH of the Unit.
	8	Coal pipe materials at direction changing sections and flow curvature zones to be replaced by higher grade material like high chrome alloy steel Unit- 3	At present these bends are in ceramic are having satisfactory performance
	9	Coal pipe materials at direction changing sections and flow curvature zones to be replaced by higher grade material like high chrome alloy steel Unit- 4	At present these bends are in ceramic are having satisfactory performance
	10	Coal pipe materials at direction changing sections and flow curvature zones to be replaced by higher grade material like high chrome alloy steel Unit- 5	At present these bends are in ceramic are having satisfactory performance

	11	Transformer management for CT transformers and ESP transformers	1. During AOH/COH preventive maintenance carried out. 2. Oil sample sent to ERDA twice a year for testing.
	2	Avoiding leakage of boiler drum safety valves through 50 mm drain line in place of 12.5 mm line **Unit - 3,4 & 5.**	
P-12	**1**	Knowledge management portal.	Oct-09
	2	Replacement of electro mechanical relays for generator protection may be replaced by group solid state numerical relays.	
	3	Replacement of Electro-Mechanical Relays for Generator Protection may be replaced by Group Solid State Numerical Relays.	Already implemented for Generator-4 & Relay for UAT will be procured.
P-13	**1**	Replacement of Old and Obsolete Primary Sensors with Smart Digital Data Transmission. Unit-3	
	2	Replacement of APH seals Unit-3,4,5	Carried out in AOH / COH.
	3	**Sonic soot blowers** may be re-commissioned.Unit-4	Implemented for A/H
	4	**Sonic soot blowers** may be re-commissioned.Unit-5	Implemented for A/H
	5	Condenser tube acid cleaning followed by bullet shot cleaning followed by Condenser tube surface painting by brushable ceramic coating; 40 % condenser tube replacement Unit-3	Work completed.1000 Nos of condenser tubes replaced

	6	Condenser tube acid cleaning followed by bullet shot cleaning followed by Condenser tube surface painting by brushable ceramic coating; Unit-4	Work is carried out in AOH /COH
	7	Condenser tube acid cleaning followed by bullet shot cleaning followed by Condenser tube surface painting by brushable ceramic coating; Unit-5	Work is carried out in AOH /COH
	8	Replacement of APH seals	APH seals replaced in AOH/COH
	28	Steam path audit: Conduct of steam audit and replacement of important elements like seals, eroded blading, diaphragms, etc.Unit-3	Carried for Unit-3
P-13	**1**	Replacement of rear RH coils Unit-3	Replaced in Apr 10
	2	Replacement of LTSH coils Unit- 3 (B/M-II)	Replaced in Apr 10
	3	Replacement of platen Water wall and LTSH coils Unit- 4	Replaced in July- Aug 2009
	4	Partial replacement of ECO coils Unit- 5	Replaced in Dec -2010