Annex – 4
(Immediate measures with financial implication)

Table 1: KTPS status of CPRI recommendation immediate term with financial implications.

S.N.	Total Nos.	Implemented till Date	STATION / UNIT	CPRI Recommendations	Date / Month of Implementation	Work Done / Action Taken as on 31/12/2011	Effects / Results / Improvement seen	Section	Remarks
1	21	11	STATION	Installation of belt weighers for all coal conveyors together with instrumentation for integration and measurement of unit wise bunkered coal. {A) BW on BC 6A & 6B for total bunkered coal for Unit-1 to 4. B) BW on BC 3A & 3B for coal received to crusher. C) BW on BC 3A & 3B for blended imported coal discharge from road hopper. D) BW on BC 9 & 10 for coal stacked / reclaimed. E) BW on BC 7A & 7B for Unit-1 & 2 and on BC 7E & 7F for Unit-3 & 4 for unit wise coal bunkered. }		A) Belt weighers of Conv. 6A & 6B are in service since April-2007 & Oct-2008 respectively. B) Belt weighers for Conv. 3A & 3B for total coal to crusher are already installed & commissioned in May-2009. C) Belt weighers for Conv. 3A & 3B for blended imported coal are installed & commissioned in 3A on 3/12/2010and 3B on 8/12/2010 D) Belt weighers for Conv. 9 & 10 are installed and commissioned for con No 9&10 on dated 25/11/2010 E) Budgetary offer for belt weigher of Conv. 7A / 7B / 7E / 7F is received and will be installed after evaluating the performance of belt weigher on conveyor 3A,3B,6A,6B.	Effect can be seen only after successful installation & commissioning of these belt weighers.	CHP	Partially implemented

2			STATION	Fully automatic pit-less in motion weigh bridges/ wheel impact load detector (WILD) for measurement of coal		As per survey of M/s IPA representative along with M/s. Weightech ,40 m straight length is required on both directions of pitiless in-motion weigh bridge and the site i.e. Pt. No. 11 of rail track is not feasible. In view of above, the installation of pitless in-motion weigh bridge is not possible.	Remark - Pit-less in motion weigh bridge is not feasible. Budgetary offer for WILD system is awaited.	CHP	Not feasible
3			STATION	Software for online coal energy management	Jan-2012	Wagon tippler 1 & 2 integrated with SAP. In motion weigh bridge will be integrated with SAP in Jan-12, material is received.		CHP/IT	
4			STATION	Rail signature system at the sending and arrival point to ensure that the rails have arrived at their intended destination		This issue is discussed with Railways. Presently there is no such system available with railways. In future, if railway provides access to such system, then the data can be interfaced SAP.		CHP/IT	Not feasible
5			STATION	Rail tracking system through GPS or alternative technologies	Jan-2000	The feature is already functional & monitored through web site.		CHP	

6			STATION	Rail signature system for monitoring the time of each rail hopper carriage over a bunker as well as measure the weight.		A) Belt wighers of Conv. 6A & 6B are in service since April-2007 & Oct-2008 respectively. B)Belt weighers for Conv. 3A & 3B for total coal to crusher are already installed & commissioned in May-2009. C) Belt weighers for Conv. 3A & 3B for blended imported coal are installed & commissioned in 3A on 3/12/2010and 3B on 8/12/2010 D) Belt weighers for Conv. 9 & 10 are installed and commissioned for con No 9&10 on dated 25/11/2010 E) Budgetary offer for belt weigher of Conv. 7A / 7B / 7E / 7F is received and will be installed after evaluating the performance of belt weigher on conveyor 3A,3B,6A,6B.	0	CHP	Partially implemented
7			STATION	Microwave or Ultrasonic bunker level monitoring system with digit		Siemens make Radar type level transmitter for measurement of bunker level of bunker No. 2A of unit#2 is installed & commissioned on dtd. 30/06/2010. Performance was not satisfactory hence installed at	Effect can be seen only after successful installation & commissioning of this bunker level monitoring system.	CHP	

						bunker 2F.It will be installed for all the remaining bunkers of all units after observing the performance by March-2011.			
8			STATION	Grab cranes for removal of stones from the wagon tippler area.	Feb-2011	Hyva - make, pedestal mounted hydraulic knuckle boom crane with rock grapple unit for picking / lifting of stones from wagon tippler No. 1 hopper is received and work is executed on 8/2/2011.	Effect / result / improvement can be seen only after successful installation & commissioning of this hydraulic knuckle boom crane at wagon tippler.	CHP	
9			STATION	The gravimetric feeders may be put to use and their coal consumption may be monitored.		Proposal & DPR for procurement Gravimetric rotor weigh feeder is sent to HO vide letter no. KHG/BM/Corr./393/8842 Dtd.22/12/09. Reply to HO observation sent on dated 14/03/2011.AsMOM dated 13/10/11 DPR will be processed.		BM	
10			STATION	Coal fed into the bunker mine wise and its percentage must be declared at the beginning of the shift.	Dec-2010	Software will be made available by Dec-2011, as same is covered in software for online coal energy management.		CHP	

11			STATION	Special compactors can be used for compacting coal to avoid spontaneous combustion by minimizing air pockets.		Requirement shall be consolidated at BTPS and sent to HO	0	CHP	
12			STATION	Implementing fogging dust suppression system at all level from wagon tippling to bunkering	Dec-2009	i) For effective fogging system of wagon tippler, additional headers with mist generators are installed for W/T-I & W/T-II in Nov-09 end. ii) Conflow system is introduced on Conv. 4A & 4B. iii) DPR for Dust Extraction System of crusher house and renovation / revamping of bunker DE system of Unit - 1 & 2 is in process.	i) Effect of fogging system of W/T - 1 & 2 can be evaluated by the end of Dec-09. ii) Due to introduction of conflow system on Conv. 4A & 4B, dust level is slightly reduced. iii) Effect / improvement can be seen only after successful installation & commissioning of new Dust Extraction system of crusher house. iv) Effect / improvement can be seen only after successful installation & commissioning of new Dust Extraction system of bunker Unit - 1 & 2.	CHP	

13			UNIT-1	Installation of gravimetric feeders for the Unit coal flow measurement.		Proposal & DPR for procurement Gravimetric rotor weigh feeder is sent to HO vide letter no. KHG/ BM/ Corr./ 393/ 8842 Dtd. 22/12/09.Reminder letter sent to CE (Works) vide Letter No. KHG / BM-1 / Corr. / 2011 / 26 / 13556 Dtd. 14/09/2011		BM	
14			UNIT-2	Installation of gravimetric feeder for measurement of coal flow		Reminder letter sent to CE (Works) vide Letter No. KHG / BM-1 / Corr. / 2011 / 26 / 13556 Dtd. 14/09/2011		BM	
15			UNIT-4	Zero coal leak policy may be incorporated	Jan-2010	Already in practice.		BM	
16			STATION	Special compactors can be used for compacting coal to avoid spontaneous combustion by minimizing air pockets.		Consolidated at BTPS and sent to HO		HO	
17			STATION	'Zero coal leak tolerance' policy	Jan-2010	Complete replacement of PF pipes for Unit 1 & 2 carried in AOH. On-line coal leakage attending contract is already in service.		BM	
18			STATION	Calibration of RC feeder speed for coal flow in mills	Dec-2009	After Boiler Maintenance work feeder speed calibration for coal flow is done. PR for gravimetric feeders for U1&2 sent to HO		BM&TIC	
19			UNIT-1	Zero coal leak policy may be incorporated to prevent loss of pulverized coal	Jan-2010	Mill outlet elbows, MDV's, MPO's, for all the 06 Nos. of coal mills have been replaced		BM	

						and partial replacement of fuel pipes and bends carried out during AOH.			
20			UNIT-3	Zero coal leak policy may be incorporated.	Nov-2009	Partial replacement of PF pipes for Unit 3, is carried in AOH.		BM	
21			STATION	The risk of the transit loss can be made to be included in the scope of the Liaison agent and this can be included in the tender document for appointing of Liaison agent in future.	Jan-2010	Included in the scope of Liaison agent		HO	
22	2	1	STATION	Installation of 18 nos. of fully automatic water flow meters with digital output, communication media to relay the data to a central server	Oct-2009	All flow Meters installed except for CW flow which will be procured in 12-13		TIC	
23			STATION	Water monitoring software package		14 No's flow meters are already commissioned .Software will be developed after making all the measurements available in a single computer in Modbus TCP format & will be integrated through SAP.		WTP/IT	
24	5	2	STATION	Procurement of TGA analysis of the coal for operational optimization		Non DPR sent to HO in Oct 11		WTP	
25			STATION	Procurement of a CHN apparatus for ultimate analysis for operational optimization		Non DPR sent to HO in Oct 11		WTP	
26			UNIT-1	TGA analysis of coals fired into the boiler can help to optimize combustion controls.		Non-DPR sent to HO in Oct 11.Approval received in Dec 11. Tender to be floated		WTP	

27			STATION	For further refinement in the heat value determination, it is recommended to measure sample to sample variation in a rake (for receiving end coal) for each rake and to measure in-sample variation to select the minimum sample size.	May-2009	Implemented w.e.f 15-May-2009.		WTP	
28			STATION	For further refinement in the heat value determination, it is recommended to measure sample to sample variation in a shift (for bunkered coal) for each bunker and to measure in-sample variation to select the minimum sample size.	May-2009	Implemented w.e.f 15-May-2009.		WTP	
29	5	3	STATION	Ultrasonic level indicators for all fuel oil tanks	Nov-2010	Level indicators installed and commissioned in Nov 10.Local & remote readings available.		TIC	
30			STATION	Fully automatic differential pressure orifice plate or nozzle type or mass based oil flow meters with provision for continuous digital data transfer may be installed for all units.	Jan-2012	Commissioned for Unit 2,3,4 & will be commissioned for Unit 1 during AOH in Jan12 Performance under observation		TIC	
31			STATION	Oil gun on-off operation data must be recorded through a time based system automatically	Oct-2010	Implemented in Unit no. 1 to 4.		TIC	
32			STATION	Pitless in motion weighbridge is recommended or measurement of oil in tankers.		As per survey of M/s IPA representative along with M/s. Weightech ,40 mtr straight length is required on both directions of pitless in-motion weigh bridge and the site i.e. Pt. No. 11 of rail track is not	0	CHP	Not feasible

						feasible. In view of above, the installation of pitless in-motion weigh bridge is not possible.			
33			STATION	Fuel oil monitoring software package		Radar type level indicators & mass flow meters with wireless communication installed. Software development under progress.		TIC/IT	
34	18	2	STATION	Electrical energy monitoring unit wise consumption through continuous recording type with digital interface and provision for Tantalisation over the year.	Dec-2010	System installed and trial taken. Data to PCR and OS through lAN is in progress.		TIC	
35			STATION	The online heat rate evaluation package may be used for computation of unit heat rate and from this the station heat rate can be computed.	Dec-2010	Operation - Will be implemented after installation of on line GCV analysers. proposal sent to HO in OCT11		TIC, Operation, CHP, IT	
36			UNIT-1	O2 measurement may be introduced after APH. This will give the APH in-leakage.		Tender is in process.		TIC	
37			UNIT-1	The O2 measurement may be on the basis of forming a grid of a minimum of 6 sensors in one duct.		Tender is in process.		TIC	
38			UNIT-1	Continuous monitoring of CO before APH may be introduced for combustion optimization.		Tender is in process.		TIC	

39			UNIT-2	O2 measurement may be introduced after APH. This will give the APH in-leakage.		Tender is in process.		TIC	
40			UNIT-2	The O2 measurement may be on the basis of forming a grid of a minimum of 6 sensors in one duct.		Tender is in process.		TIC	
41			UNIT-2	Continuous monitoring of CO before APH may be introduced for combustion optimization.		Tender is in process.		TIC	
42			UNIT-3	O2 measurement may be introduced after APH. This will give the APH in-leakage.		Tender is in process.		TIC	
43			UNIT-3	O2 measurement may be on the basis of forming a grid of a minimum of 6 sensors in one duct.		Tender is in process.		TIC	
44			UNIT-3	Continuous monitoring of CO before APH		Tender is in process.		TIC	
45			UNIT-4	O2 measurement may be introduced after APH at the ID fan discharge.		Tender is in process.		TIC	
46			UNIT-4	O2 measurement may be on the basis of forming a grid of a minimum of 6 sensors in one duct.		Tender is in process.		TIC	
47			UNIT-4	Continuous monitoring of CO before APH may be introduced.		Tender is in process.		TIC	
48			UNIT-1	Temperature sensors with indicators may be installed for energy monitoring of passing of high energy drains.		Scheme shall be implemented in one unit on trial basis in AOH. Presently temp are measured by laser gun		TIC	
49			UNIT-2	Temperature sensors with indicators for energy monitoring of passing in high energy drains.		Scheme shall be implemented in one unit on trial basis in AOH. Presently temp are measured by laser gun		TIC	

50			UNIT-3	Temperature sensors with indicators may be installed after high energy drains for energy monitoring of passing.		To be reviewed after commissioning in Unit 1		TIC	
51			UNIT-4	Temperature sensors with indicators may be installed after high energy drain valves for energy monitoring of passing.		To be reviewed after commissioning in Unit 1		TIC	
52	8	6	UNIT-1	Oxygen measurement must be introduced in the Deaerator.		New SWAS proposal is being made by WT Plant. Work started in Oct 11 &will be completed by June12		WTP	
53			UNIT-2	Oxygen measurement must be introduced in the Deaerator.		New SWAS proposal is being made by WT Plant. Work started in Oct 11 &will be completed by June12		WTP	
54			UNIT-3	Oxygen measurement must be introduced in the Deaerator.	01-01-11	AMC for SWAS is give to Forbes Marshall. Instruments will be put in service.		WTP	
55			STATION	Round the clock condition monitoring group	Jan-2000	Already in practice	Improvement in operational efficiency (process improvement)	Operation	
56			UNIT-3	Frequent classifier settings and cleaning to ensure the fineness and ensuring design coal air mixture temperature and velocity.	Jan-2000	Already in practice.		BM	
57			UNIT-4	Oxygen measurement must be introduced in the Deaerator.	Jan-2011	AMC for SWAS is give to Forbes Marshall. Instruments will be put in service.		WTP	
58			STATION	Round the clock monitoring of units by performance optimization group	Oct-2011	GCR established at HO working in three shifts		HO	

59			STATION	Round the clock condition monitoring group	Oct-2011	GCR established at HO working in three shifts		HO	
60	1	0	STATION	In view of the wide geographic spread of MSPGCL stations across hilly and plain terrain, helicopter facilities for rapid shipping of major critical equipment like generator rotor, turbine rotor, etc., may be established through linkage with commercial cargo air liners.				HO	
61	26	23	UNIT-3	Burner mouth panels may be replaced with hard faced throat tube assemblies	Jan-2000	Coal compartment assembly, duly hard faced coal burner mouth tip and coal nozzle casting are being replaced during each COH.		BM	
62			UNIT-4	Burner mouth panels to be replaced with hard faced throat tube assemblies	Jan-2000	Coal compartment assembly, duly hard faced coal burner mouth tip and coal nozzle casting are being replaced during each COH.		BM	
63			STATION	Planning function must be incorporated with long term planning for refurbishment and renovation unit wise and equipment wise.	Feb-2000	Maintenance Planning Department (MPD) & Field Quality Assurance Department (FQAD) are being set up.		HO	
64			STATION	Cleaning of Lube oil system of all HT equipment	Jan-2000	Preventive maintenance of Lub oil motors of HT Equipment is done regularly during Overhaul or short shutdown. TM - Already in		OS	

						practice			
65			STATION	Cleaning of HT & LT panels at regular intervals.	Jan-2000	Already in practice as cleaning is done during overhauls.		EM	
66			UNIT-1	Burner mouth panels may be inspected during each outage and surface replenished periodic intervals.	Jan-2000	Already in practice.		BM	
67			UNIT-1	Renovation of the Deaerator internals.	Jan-2010	Inspection carried out in Jan 10. No abnormality observed. Regular practice during overhauls		TM	
68			UNIT-1	Overhauling of Seal air Fan 1B to avoid overloading.	Feb-2010	Overhauling of Seal air Fan 1B have been carried out. a) Discharge dampers set for equal balancing of Seal Air Fans. b) Motor overhauling done periodically during Annual Overhaul in Jan 10	0	BM & EM	
69			UNIT-2	Periodic cleaning of ash and debris collection in fan duct during any available outage.	Jan-2000	Already in practice.		BM	
70			UNIT-2	Burner mouth panels may be inspected during each outage and surface replenished periodic intervals.	Jan-2000	Already in practice.		BM	
71			UNIT-2	Renovation of the Deaerator internals.	Sep-2010	Dearerator Internals inspected found ok, Vent condenser tube flarings found damage. Offer called from OEM. DPR sent to HO		TM	

72			UNIT-2	All air dampers such as APH, FDF, PAF and IDF to be checked and calibrated for position.	Jan-2000	Already in practice		BM	
73			UNIT-2	Seal air filters may be cleaned more frequently to minimize the pressure drop across them.	Jan-2000	Already in practice.		BM	
74			UNIT-3	Restoration of the clearance between fan impeller blades & casing during an outage	Jan-2000	Clearance between fan impeller blades & casing is measured and monitored		BM	
75			UNIT-3	All air dampers such as APH, FDF, PAF and IDF to be checked and calibrated for position	Nov-2009	All air dampers such as APH, FDF, PAF and IDF are checked and calibrated for position		BM	
76			UNIT-3	Periodic cleaning of ash and debris collection in fan duct during any available outage.	Nov-2009	Cleaning is carried out during available outages		BM	
77			UNIT-3	Renovation of the Deaerator internals.	Nov-2009	Performance of Deaerator checked. Found normal. Regular practice during overhauls		TM	
78			UNIT-4	Restoration of the clearance between ID fan impeller blades & casing during an outage	Jan-2000	Already in practice.		BM	
79			UNIT-4	All air dampers such as APH, FDF, PAF and IDF to be checked and calibrated for position	Jan-2000	All air dampers such as APH, FDF, PAF and IDF are checked and calibrated for position		BM&TIC	
80			UNIT-4	Periodic cleaning of ash and debris collection in fan duct during any available outage.	Jan-2000	Already in practice. Cleaning is carried out during available outages		BM	
81			UNIT-4	Replacement of HP / LP turbine bypass valves and HP heater group bypass valve.	Jan-2011	Action plan implemented in COH Jan 2011		TM	

82			UNIT-4	Renovation of the Deaerator internals.	Jan-2011	Action plan implemented in COH Jan 2011		TM	
83			STATION	Annual overhauls need to be carried out every year and should not be deferred by over 2 months under any circumstance.		As far as we stick to planned schedule subject to stability of grid condition		HO	
84			STATION	Mini overhauls of 10 days intervals can be considered instead of an AOH if there is no single activity exceeding 10 days. However, these should not e delayed by over a month from the schedule.		Mini overhauls are planned in 5 year overhaul schedule. Mini overhaul of U2 carried out in Sept 11		HO	
85			STATION	Capital overhauls may be taken up in 5 years intervals without fail and should not be delayed by over 3 months under any circumstance.		As far as we stick to planned schedule subject to stability of grid condition		HO	
86			STATION	Multiple tier decisions resulting in frequent changing of the R & M plans must be avoided.	Jan-2009	Five year rolling plan prepared		HO	
87	6	5	UNIT-1	Provision for rolling of the turbine through ATRS may be exercised. Turbine rolling must only be through ATRS.	Jan-2010	Rolling of Turbine is done through ATRS.		TIC	
88			STATION	Operators need to operate the units on sliding pressure mode with 3 element drum level control and through ATRS.	Jan-2010	Being implemented at partial load.	ATRS - Process improvement (safe rolling).	TIC&Operation	
89			STATION	Maintaining the coal – air temperature near to design value	Aug-2009	Cold air gates & dampers checked for passing during AOH	Process improvement	BM&Operation	

90			STATION	Increase the PA fan discharge pressure near to the design value	Aug-2009	Secondary & Cold air dampers checked during overhaul and by attending air leakages of casing & duct.	0	BM&Operation	
91			UNIT-3	Provision for sliding pressure operation to be exercised.	Aug-2009	Unit put on sliding pressure mode on 19/08/2009		TIC	
92			STATION	Technical experts group must be formed by identifying experts from among various MSPGCL power stations.		Policy matter. Referred to HO		HO	
93	8	4	STATION	Formation of quality circles at Khaperkheda TPS.	Dec-2009	Quality circles are formed. Willpower QC of TM got Excellence award & Green belt QC of WTP got Distinguish award at National level competition held at Hyderabad in Dec12	Operation - Process improvement	CGM	
94			STATION	All operators of must undergo simulator training over a period for upgrading their skills.	Jan-2009	Simulator training is conducted at Koradi Training centre		HO	
95			STATION	Re-look of the promotional procedures and policies.		Under consideration		HO	
96			STATION	Financial incentives in areas like wagon tippling, etc., where the productivity results in financial gains to MSPGCL.		Under consideration		HO	
97			STATION	360° feedback is essential for all training programs	Jun-2010	MIS_IT - Training Software is developed and in use as per the requirement of EE (Training) TSC - KPA, KRA & KPI for different		HO	

						Jobs will be decided as part of the TNA exercise being taken up for all Power Station. These will further facilitate implementation of 360 Deg Feedback.			
98			STATION	Simplification and expediting of process for deputing engineer and technicians for training .	Jun-2010	Implemented		HO	
99			STATION	Quality training through MBA, M.Tech., BE, etc.				HO	
100			STATION	Performance based job delivery system are in place at all levels at the section level. These must be focused at the individual engine level. Job functions must be liked to performance.				HO	
101	33	18	UNIT-1	Gas proportioning dampers, flue gas, primary and secondary air dampers should be retrofitted with cold hardened material (medium alloy steel or high carbon steel) with in built hard overlay of tungsten carbide.	Jan-2010	Gas proportioning dampers are not provided at Khaperkheda units. For primary & secondary dampers – material up gradation i.e. high carbon steel with in built hard overlay of tungsten carbide carried out during annual overhaul.		BM	
102			UNIT-1	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.	Jan-2010	All the gas flow guide vanes, direction vanes, diversion baffles are inspected. Materials used for diversion baffles is alloy steel with overlay of hard		BM	

						materials like silicon carbide or tungsten carbide.			
103			UNIT-1	Replacement of the eddy current feeder drive by VFD.		Tender is published.		TIC	
104			UNIT-1	Retrofitting of fuel oil pump motor with VFD for smooth control and invocation of oil guns.		DPR preparation is in process		EM	
105			UNIT-1	Retrofitting of mill with dynamic classifier.		Not feasible with existing coal mill		BM	Not feasible
106			UNIT-1	Bunker level measurement system for bunkers.		Siemens make Radar type level transmitter for measurement of bunker level of bunker No. 2A of unit#2 is installed & commissioned on dtd. 30/06/2010. Performance was not satisfactory hence installed at bunker 2F.It will be installed for all the remaining bunkers of all units after observing the performance by March-2011.	Effect can be seen only after successful installation & commissioning of this bunker level monitoring system.	CHP	
107			UNIT-1	Introduction of digital AVR system		Material received. Will be commissioned in Jan12 forU1		TIC	

108			UNIT-2	To improve the longevity and performance of the dampers, gas proportioning dampers, flue gas, primary and secondary air dampers should be retrofitted with cold hardened material (medium alloy steel or high carbon steel) with in built hard overlay of tungsten carbide.	Sep-2010	Gas proportioning dampers are not provided at Khaperkheda units. For primary & secondary dampers – material up gradation i.e. high carbon steel with in built hard overlay of tungsten carbide carried out during annual overhaul.		BM	
109			UNIT-2	Replacement of the eddy current drives of feeders by VFD		Tender is published.		TIC	
110			UNIT-2	Retrofitting of fuel oil pump motors with VFD for smooth control and invocation of oil guns.		DPR preparation is in process	0	EM	
111			UNIT-2	Retrofitting of mill with dynamic classifier.		Not feasible with existing coal mill		BM	Not feasible
112			UNIT-2	Bunker level measurement system for bunkers.		Initially, Microwave Radar type level monitoring system will be installed for single bunker of Unit-2 by the Oct-2009. After assessing the performance for 2 months, it will be installed for all the remaining bunkers of all units by March-12	Effect can be seen only after successful installation & commissioning of this bunker level monitoring system.	CHP	
113			UNIT-3	Change over to dynamic classifiers for mill		Reminder vide letter no. KHG/BM/CORR./2010/336/11898 Dtd. 31/08/10 is sent to M/s. BHEL.		BM	Budgetary offer

114			UNIT-3	Gas proportioning dampers, flue gas, primary and secondary air dampers to be retrofitted with cold hardened material with in built hard overlay of tungsten carbide.	May-2011	Gas proportioning dampers are not provided at Khaperkheda units. For primary & secondary dampers – material up gradation i.e. high carbon steel with in built hard overlay of tungsten carbide carried out during annual overhaul.		BM	
115			UNIT-3	During overhaul all the gas flow guide vanes, direction vanes, diversion baffles are to be inspected and replaced for flow diversions. Materials of diversion baffles must use alloy steel with overlay of hard materials like silicon carbide or tungsten carbide.	Nov-2009	During OH inspection of APH outlet to ESP inlet duct have been carried out and repair of flue gas guide vanes and direction vanes, diversion portion & slant portion carried out and application FTC chemical bonded refractory have been carried out. Rate of erosion at unit no.3 is less than that of unit no. 1 & 2.		BM	
116			UNIT-3	Replacement of fuel oil pump motor with VFD.		DPR preparation is in process	0	EM	
117			UNIT-3	Bunker level measurement system for bunkers.		Initially, Microwave Radar type level monitoring system will be installed for single bunker of Unit-2 by the Oct-2009. After assessing the performance for 2 months, it will be installed for all the remaining	Effect can be seen only after successful installation & commissioning of this bunker level monitoring system.	CHP	

						bunkers of all units by March-12			
118			UNIT-4	Change over to dynamic classifiers for mills		Reminder vide letter no. KHG/BM/CORR./2010/336/11898 Dtd. 31/08/10 is sent to M/s. BHEL.		BM	Budgetary offer
119			UNIT-4	Gas proportioning dampers, flue gas, primary and secondary air dampers should be retrofitted with cold hardened material (medium alloy steel or high carbon steel) with in built hard overlay of tungsten carbide.	Jan-2011	Gas proportioning dampers are not provided at Khaperkheda units. For primary & secondary dampers – material up gradation i.e. high carbon steel with in built hard overlay of tungsten carbide carried out during capital overhaul.		BM	
120			UNIT-4	All the gas flow guide vanes, direction vanes, diversion baffles to be inspected and replaced with alloy steel with overlay of silicon carbide or tungsten carbide.	Jan-2011	During OH inspection of APH outlet to ESP inlet duct have been carried out and repair of flue gas guide vanes and direction vanes, diversion portion & slant portion carried out and application FTC chemical bonded refractory have been carried out. Rate of erosion at unit no.3 is less than that of unit no. 1 & 2.		BM	
121			UNIT-4	Retrofitting of fuel oil pump motor with VFD		DPR preparation is in process	0	EM	

122			UNIT-4	Bunker level measurement system for bunkers.		Initially, Microwave Radar type level monitoring system will be installed for single bunker of Unit-2 by the Oct-2009. After assessing the performance for 2 months, it will be installed for all the remaining bunkers of all units by March-12	Effect can be seen only after successful installation & commissioning of this bunker level monitoring system.	CHP	
123			STATION	In the heat exchanger replacement process, the station must explore possibilities of material up gradation, material profile improvement, design changes to improve velocity profiles and improved erosion control devices in preference over old design and old material.	Sep-2010	This aspect is covered while replacement of HP heaters in U1&2		TM	
124			UNIT-1	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 un-bonded, felted, mineral / rock / slag wool mattresses.	Feb-2010	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm high grade material and insulation of the flue gas ducts by new un-bonded, felted, mineral / rock / slag wool mattresses have been carried out.		BM	
125			UNIT-1	Coal pipe materials at direction changing sections and flow curvature zones to be replaced by higher grade material like high chrome alloy steel	Jan-2000	Already in practice.		BM	

126			UNIT-1	During the next overhaul, restoration of the clearance between fan impeller blades & casing. Chrome Carbide weld overlay to fill the damaged portions, so that its performance will not deteriorate over a period 5 to 6 years.	Jan-2000	Already in practice.		BM	
127			UNIT-2	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm superior grade material	Oct-2010	Work is completed in AOH in Sept 10		BM	
128			UNIT-2	Higher grade of material for coal pipe at direction changing sections and flow curvature zones.	Jan-2000	Already in practice.		BM	
129			UNIT-2	During the next overhaul, restoration of the clearance between fan impeller blades & casing & Chrome Carbide weld overlay to fill the damaged portions.	Jan-2000	Already in practice.		BM	
130			UNIT-3	Replace MS, HRH and HRH drain valve stems by stellited seats & valve plug with Inconel 750	Nov-2009	Performance of the valves checked. Found normal. Regular practice during overhauls		TM	
131			UNIT-3	Upgrading materials of coal pipes at corners and curves.	Jan-2000	Already in practice.		BM	
132			UNIT-3	Replacement of flue gas ducting zones prone to erosion with 6 to 8 mm better grade material	Nov-2009	Cleaning is carried out. Flue gas duct have been repaired and FTC super chemical bonded refractory was applied at slant, diverter & guide vane zone.		BM	
133			UNIT-4	Coal pipe materials at direction changing sections and flow curvature zones to be replaced by higher grades.	Jan-2000	Already in practice.		BM	

134	40	31	STATION	Closed circuit TVs may be installed in boiler elevations for Units 1-4		Not economically viable.		TIC	Not feasible
135			UNIT-1	Coal flow balance between pipes in an elevation to within ±10 % of the mean value through a variable air jet at a pressure of 110-120 kPa and at an angle of 45° across the pulverized coal flow pipe passage.		TIC - DPR for Unit-1 is in principle approved by MERC. On trial basis, it will be implemented in Unit-1. Tender floated		TIC	
136			UNIT-1	The restoration of on line condenser ball cleaning system to ensure efficient operation of the condenser.		Order Draft is prepared & sent to HO for approval		TM	
137			UNIT-2	Coal flow balance between pipes in an elevation to within ±10 % dynamic flow resistance.		TIC - DPR for Unit-1 is in principle approved by MERC. On trial basis, it will be implemented in Unit-1. After evaluating benefits, it will be implemented in Unit-2.		TIC	
138			UNIT-2	The restoration of on line condenser ball cleaning system to ensure efficient operation of the condenser.		Order Draft is prepared & sent to HO for approval		TM	
139			UNIT-3	Coal flow balance between pipes in an elevation within ±10 % by dynamic air assisted balancing		TIC - DPR for Unit-1 is in principle approved by MERC. On trial basis, it will be implemented in Unit-1. After evaluating benefits, it will be implemented in Unit-3.		TIC	
140			UNIT-4	Coal flow balance between pipes in an elevation to within ±10 % through dynamic flow resistance created by an air jet.		TIC - DPR for Unit-1 is in principle approved by MERC. On trial basis, it will be		TIC	

						implemented in Unit-1. After evaluating benefits, it will be implemented in Unit-4.			
141			STATION	Strategic planning for integrated management (all MSPGCL) of cold stand high capacity and high power by equipment like ID fans, motors, generator rotors, etc.	Dec-2009	Implemented		HO	
142			STATION	'Zero steam leak tolerance' declaration	Jan-2000	On line sealing is already in practice for turbine & boiler. The steam leakages at OHP &main are attended by availing possible opportunity.		TM&BM	
143			STATION	Arresting air leakages and flue gas leakages in ducts .	Jan-2000	In practice		BM	
144			STATION	Optimizing the time for wagon tipplers	Mar-2010	KEC - make, 55 KW digital regenerative thryistor converter panel for inhaul beetle charger No.- 2 is commissioned on dtd. 03/02/2010 & inhaul beetle charger No 1 panel is commissioned on dtd. 08/03/2010.	As electrical problems of inhaul wagon marshalling system are reduced to Zero, Wagon Positioning Time is optimised.	CHP	
145			STATION	Operating CHP near to its full capacity.	Jan-2010	Feeding is optimized & will be monitored after the installation of belt weighers for Conv. 7A, 7B, 7E & 7F and Conv 9 & 10.		CHP	

146			STATION	Optimizing the voltage at clear water pump motor terminals.	Oct-2010	Work carried out in Dec 10		EM	
147			STATION	Overhauling of ASP-F and HSWP-A pumps & motors to avoid overloading	Jan-2010	Overhaul Work completed on 01/01/2010		EM&AHP	
148			STATION	Overhauling of ASP-C pump and motor to avoid unloading (unbalance) between 3-phases at motor terminals.	Dec-2009	Overhaul of ASP-C is already completed in 14/09/2009	ASPC - Motor loading found balance in three phase after overhaul	EM&AHP	
149			STATION	Overhauling of inter-stage cooler heat exchanger .	Jan-2000	Already in practice.		TM	
150			UNIT-1	The flexible insulation of the boiler to be replaced at hot spots (30 %).	Jan-2010	Flexible insulation of the boiler is replaced at hot spots.		BM	
151			UNIT-1	Replacement of Ciporex slabs at the damaged portions of the penthouse.	Jan-2010	Ciporex slabs at the damaged portions of the penthouse replaced in COH inJan2010.Further procurement planned in 12-13		CIVIL	
152			UNIT-1	The insulation of the primary and secondary air ducts may be replaced by new unbonded, felted, mineral / rock / slag wool mattresses on need basis.	Jan-2010	The insulation of the primary and secondary air ducts is replaced by new unbonded, felted, mineral / rock / slag wool mattresses on need basis.		BM	
153			UNIT-1	MS, HRH, HRH drain valves: replace damaged valve stem by stellited seats, valve plug with Inconel 750, plug by Nitronic 60.	Jan-2010	Work completed. Regular practice during overhauls		TM	
154			UNIT-1	Overhauling PA fan motors to reduce the current unbalance between 3-phases	Jan-2010	Motor overhauled and all three phase C.T. replaced in Aug 10	Motor Currents are Balanced	EM	

155			UNIT-2	The flexible insulation of the boiler to be replaced at hot spots (30 %).	Oct-2010	Work is completed in COH in Jan10		BM	
156			UNIT-2	Replacement of Ciporex slabs at the damaged portions of the penthouse.	Sep-2010	Work will be carried out in AOH,procurement initiated		CIVIL	
157			UNIT-2	MS, HRH, HRH drain valves: replacement of valve internals by superior materials	Oct-2010	MS Strainer drain valves replaced, HRH strainer drain valves servicing carried out.		TM	
158			UNIT-2	Measures to reduce steam losses in piping such as insulation and stopping of leaks.	Oct-2010	Insulation repaired, revamped in damage area in Sept COH 2010		TM	
159			UNIT-2	Restoration of insulation and cladding at appropriate places in the MS and RH lines.	Oct-2010	Insulation repaired, revamped in damage area in regular manner		BM	
160			UNIT-2	Overhauling PA fan motors to reduce the current unbalance between 3-phases	Oct-2010	Work completed in Sept 10	0	EM	
161			UNIT-2	Overhauling of Seal Air Fan 2A to avoid overloading.	Oct-2010	Overhauling of Seal air Fan 2A have been carried out. a) Discharge dampers set for equal balancing of Seal Air Fans. b) Motor overhauling done periodically during Annual Overhaul in Sept 10	0	BM&EM	
162			UNIT-3	Insulation of steam lines	Nov-2009	Performance is normal. Regular practice during overhauls		TM	
163			UNIT-3	The flexible insulation of the boiler needs to be replaced at hot spots (30 %).	Nov-2009	The flexible insulation of the boiler is replaced at hot spots (30%)		BM	

164			UNIT-3	Replacement of Ciporex slabs at the damaged portions of the penthouse.	Nov-2009	Inspection carried out in AOH & Ciporex slabs found in good condition.		CIVIL	
165			UNIT-3	Insulation of the primary and secondary air ducts may be replaced by new unbounded, felted, mineral/rock/slag wool mattresses on need basis.	Nov-2009	Insulation of the primary and secondary air ducts are replaced by new unbounded, rock wool mattresses		BM	
166			UNIT-3	Arresting of steam leaks from soot blower and auxiliary steam lines and re-insulation.	Jan-2000	Already in practice.		BM	
167			UNIT-4	Arresting of steam leaks from soot blower and auxiliary steam lines; and insulation of steam lines	Jan-2000	Already in practice.		BM	
168			UNIT-4	The flexible insulation of the boiler needs to be replaced at hot spots (30 %).	Jan-2011	Attended in COH in Jan2011		BM	
169			UNIT-4	Replace MS, HRH, HRH drain valve stem by stellited seats, valve plug with Inconel 750.	Jan-2011	Action plan implemented in COH Jan 2011		TM	
170			UNIT-4	Replacement of Ciporex slabs at the damaged portions of the penthouse.	Jan-2011	Ciporex slabs are in good condition. However inspection will be carried out in AOH.		BM	
171			UNIT-4	Insulation of the primary and secondary air ducts to be replaced by new unbonded, felted, mineral/rock/slag wool mattresses on need basis.	Jan-2011	Attended in COH.		BM	
172			STATION	After stabilizing and levelling of previous years backlogs of skipping of COH & AOH, maintenance budget and man power allocation should be linked to performance of the units in terms of availability.				HO	

173			STATION	MSPGCL must have back to back MoU understanding with neighbouring utilities for sharing of hardware, technical expertise and knowledge. Periodic interactions are essential for confidence building.				HO	
174	14	11	UNIT-1	Air washer unit of unit may be made effective.		Budgetary offer submitted is not feasible & Revised offer requested from other agencies. The tender proposal audited. Tender will be floated by Jan12		TM	
175			UNIT-1	Pressurization of turbine area to avoid dust in turbine floor.	Jul-2011	Present turbine house design has already taken care of dust ingress and modification is restricted due to structural constraints. Hence recommendation is deferred for implementation. (Decision as per MOM No.CE/WORKS/CPRI-Consultation/No.09510 dt.26.07.2011)		TM	
176			UNIT-2	Pressurization of turbine area to avoid dust in turbine floor.	Jul-2011	Present turbine house design has already taken care of dust ingress and modification is restricted due to structural constraints. Hence recommendation is deferred for implementation.		TM	

						(Decision as per MOM No.CE/WORKS/CPRI-Consultation/No.09510 dt.26.07.2011)			
177			UNIT-1	Boiler structures including coal bunker structure are in need of painting.		Tender proposal is initiated for the painting of Unit # 1 & 2 bunker hopper structure. Will be done in FY 2011-2012	0	BM&CHP	
178			UNIT-1	Water / air washing of boiler gallery once a month	Jun-2009	Running boiler skin washing is being carried out once in two month w.e.f. June-2009		OS	
179			UNIT-2	Boiler structures including coal bunker structure are in need of painting.		Tender proposal is initiated for the painting of Unit - 1 & 2 bunker hopper structures. Will be done in FY 2011-2012	Rusting of coal bunker structure will be avoided.	BM&CHP	
180			UNIT-2	Ash handling cleanliness to be improved by covering of trucks and filing should be covered/leak proofed to avoid dispersion of dust during filling.	Jan-2000	Already in practice		AHP	
181			UNIT-2	Water / air washing of boiler gallery once a month until cleanliness level is improved.	Jul-2009	Running boiler skin washing is being carried out once in two month w.e.f. July-2009		OS	
182			UNIT-3	Improvement in cleanliness levels in the boiler and turbine area to prevent secondary damage.	May-2009	Necessary efforts are made.		OS	
183			UNIT-3	Boiler structures including coal bunker structure are in need of painting.	01-05-11	Bunker structure painting not required.		BM&CHP	

184			UNIT-3	Water / air washing of boiler gallery once a month until cleanliness level is improved.	Aug-2009	Running boiler skin washing is being carried out once in two month w.e.f. Aug-2009		OS	
185			UNIT-4	Boiler structures including coal bunker structure to be painting.	Jan-2011	Bunker structure painting not required		BM&CHP	
186			UNIT-4	Covering of trucks and should be covered/leak proofed to avoid dispersion of fly ash during filling.	Jan-2008	Already in practice. venting system modified		AHP	
187			UNIT-4	Water / air washing of boiler gallery once a month.	Jul-2009	Running boiler skin washing is being carried out once in two month w.e.f. July-2009		OS	
	187	**117**			**117**				

Table 2: Deferred Recommendations with Justification.

S. N.	Project Code	Total Nos.	Implemented till Date	STATION / UNIT	S. N.	CPRI Recommendations	Date / Month of Implementation	Work Done / Action Taken as on 31/12/2011	Effects / Results / Improvement seen
1	P1	3	3	STATION	1	Rotary pneumatic or electrical hammers may be used for crushing coal lumps at the wagon tippler in place of manual hammering.	Aug-2009	Put in service.	Breaking of coal lumps became easier due to use of electrical hammer instead of manual hammering.
2	P1			STATION	2	Management of Wet Coal at Conveyors– Roofing for conveyors	Jan-2000	Already provided for conveyors.	During rainy season, coal on conveyor is not getting wet.
3	P1			STATION	3	Management of Wet Coal at Wagon Tippler Hoppers – Cleaning of wagon tippler grills by hydraulic operated breaking devices	Aug-2009	Electrical hammers are put in service at wagon tippler as well as at Track Hopper for breaking coal lumps.	Breaking of coal lumps became easier due to use of electrical hammer instead of manual hammering.
4	P2	15	13	STATION	1	Zero water leak policy may be adopted.	Jan-2000	Policy is already available. On line leakage attending contract is in service & other leakages are attended on regular basis .Weekly review is taken in	Operation - Reduction in leakages and conservation of Resources

								planning meeting.	
5	P2			STATION	2	Install the separate flow meter for DM water for each unit.	Nov-2009	DM flow meters are installed in Dec09	
6	P2			STATION	3	Clean the cooling tower pond, splitter plates from algae.	01-01-11	Already in practice.	
7	P2			UNIT-1	4	Reduction in permissible oxygen in steam to below 100 ppb.		New SWAS proposal is being made by WT Plant. Work started in Oct 11 &will be completed by June12	
8	P2			UNIT-1	5	Optimization of blow down (CBD+IBD) based on judicious setting of purity.	02-07-09	CBD is operated for half hour instead of one hour from 2nd July 2009.Now once in a week depending upon Silica in boiler drum.	0
9	P2			UNIT-1	6	Monitoring of make-up water to control excessive steam consumption through actual flow measurement of make up.	Jan-2000	Already in service.	0

10	P2			UNIT-2	7	Reduction in permissible oxygen in steam to below 100 ppb.		New SWAS proposal is being made by WT Plant. Work started in Oct 11& will be completed by July12	
11	P2			UNIT-2	8	Optimization of blow down (CBD+IBD) based on judicious setting of purity.	02-07-09	CBD is operated for half hour instead of one hour from 2nd July 2009.Now once in a week depending upon Silica in boiler drum.	0
12	P2			UNIT-2	9	Monitoring of make-up water to control excessive steam consumption through actual flow measurement of make up.	Jan-2000	Already in service.	0
13	P2			UNIT-3	10	Reduction in permissible oxygen in steam to below 100 ppb.	01-01-11	AMC for SWAS is given to Forbes Marshall.	
14	P2			UNIT-3	11	Optimization of blow down (CBD+IBD) based on judicious setting of purity.	02-07-09	CBD is operated for half hour instead of one hour from 2nd July 2009.Now once in a week depending upon Silica in boiler drum.	Correct monitoring of DM water make-up leads to reduction of DM water consumptio n.

15	P2			UNIT-3	12	Monitoring of make-up water to control excessive steam consumption through actual flow measurement of make up.	Jan-2000	Already in service.	Correct monitoring of DM water make-up leads to reduction of DM water consumptio n.
16	P2			UNIT-4	13	Reduction in permissible oxygen in steam to below 100 ppb.	01-01-11	AMC for SWAS is give to Forbes Marshall.	
17	P2			UNIT-4	14	Optimization of blow down (CBD+IBD) based on judicious setting of purity.	02-07-09	CBD is operated for half hour instead of one hour from 2nd July 2009.Now once in a week depending upon Silica in boiler drum.	Correct monitoring of DM water make-up leads to reduction of DM water consumptio n.
18	P2			UNIT-4	15	Monitoring of make-up water to control excessive steam consumption through actual flow measurement of make up.	Jan-2000	Already in service.	Correct monitoring of DM water make-up leads to reduction of DM water consumptio n.
19	P3	7	7	STATIO N	1	Tarpaulins may be placed before wagon tippler area.	Jan-2000	Before monsoon tarpaulins were covered on imported & indigenous coal stock after due compacting.	Due to covering of tarpaulins, while reclaiming choke up problems were as good as nil.
20	P3			STATIO N	2	To minimize sample to sample variations in coal quality use of	01-06-11	Augur received in June11,Helps for better sampling	

						automatic samplers is suggested			
21	P3			STATION	3	The simple software may be developed for computation of UHV and GCV (as per GoI formula)	Oct-2009	This software is developed and given to WTP section on our internal site.	
22	P3			STATION	4	Domes for Coal for protection from rain water.	July-11	Differed as per Board meeting	
23	P3			STATION	5	Management of Wet Coal at Stock Pile – Adequate water drains with slopes.	Jan-2000	Before monsoon, all the yard drains were cleared.	Due to cleaning of drains and maintaining the slopes, water was not accumulated in the coal piles.
24	P3			STATION	6	Management of Wet Coal at Stock Pile – Dome cover	July-11	Differed as per Board meeting	
25	P3			STATION	7	Management of Wet Coal at Stock Pile – Covering with tarpaulins	Jan-2000	Before monsoon, coal stock were covered with tarpaulins after due compacting.	Due to covering of tarpaulins, while reclaiming choke up problems were as good as nil.
26	P5	42	11	STATION	1	Software for automatic data logging of generated and auxiliary power is required for evaluation of energy consumption and its use pattern.	01-06-10	System installed and trial taken. Data to PCR and OS through LAN is in progress.	

27	P5			STATIO N	2	For all HT auxiliaries their power output should be recorded through sensors and specific energy consumption should be indicated for process optimization		DPR will be prepared. Planned in 12-13	
28	P5			STATIO N	3	The online heat rate evaluation package may be used for computation of unit heat rate and from this the station heat rate can be computed.	26-07-11	Operation - Will be implemented after installation of on line GCV analysers. proposal sent to HO in OCT11	
29	P5			STATIO N	4	Establishment of Performance Optimization Group different from Operation Services directly under station head exclusively for operational optimization activities with the supporting staff with intellectual and analytical thinking		Presently POG group is attached with OS section	
30	P5			STATIO N	5	Installation of separate energy meters for air compressors and monitor the energy consumption on daily or monthly		Proposal will be implemented in 2012-13.	

						basis.			
31	P5			STATIO N	6	At CHP, the energy consumption details have to be recorded on a daily basis and specific energy consumption can be computed on daily basis and displayed in LAN system	18-08-09	Recording of daily energy consumption started from 18/08/2009.	
32	P5			UNIT-1	7	The auxiliary power computation can be made on-line (as followed in Koradi TPS). The computation of auxiliary power for every 15 minutes interval and displayed on the computer screen.	01-06-10	System installed and trial taken. Data to PCR and OS through lan is in progress.	
33	P5			UNIT-1	8	The GT secondary energy meter (from GCR) reading may also be incorporated in auxiliary power computation. This will give the total auxiliary power including GT losses.		Spare signal not available with MSETCL. However signal will be made available after installation of check meter by MSETCL. Matter to be taken up with GCR.	
34	P5			UNIT-1	9	The auxiliary power variation with plant load may be plotted and made		Up gradation of east package by MAXDNA to be taken in 2012-13	

						available at control room for the operator to monitor the auxiliary power.			
35	P5			UNIT-1	10	The currents of individual equipment for different plant load may be made available in the control room.		Available in Unit No 3 & 4.Will be made available in Unit 1 & 2 after up gradation of east package by MAXDNA to be taken in 2012-13	
36	P5			UNIT-1	11	Installation of primary transducers for online recording of Feed water flow, condensate flow, CW flow, air flow through FD and PA fans; O2 in flue gas at APH inlet and outlet.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	
37	P5			UNIT-1	12	Provision for online computation of coal flow for the purpose of calculating SEC by calibrating the Feeder speed.		DPR sent to HO for Gravimetric feeder.	
38	P5			UNIT-1	13	On-line computation of flue gas flow.		Work will be carried out in R&M in FY 15-16	
39	P5			UNIT-1	14	Installation of power transducers for all major HT equipments.		Will be implemented after up gradation of east package in2012-13	

40	P5			UNIT-1	15	On-line computation and monitoring of specific energy consumption for each HT equipment.		Procurement planned in 2012-13	
41	P5			UNIT-2	16	The auxiliary power computation can be made on-line (as followed in Koradi TPS). The computation of auxiliary power for every 15 minutes interval and displayed on the computer screen.	March-11	System installed and trial taken. Data to PCR and OS through lan is in progress.	
42	P5			UNIT-2	17	The GT secondary energy meter (from GCR) reading may also be incorporated in auxiliary power computation. This will give the total auxiliary power including GT losses.		Spare signal not available with MSETCL. However signal will be made available after installation of check meter by MSETCL. Matter to be taken up with GCR.	
43	P5			UNIT-2	18	The auxiliary power variation with plant load may be plotted and made available at control room for the operator to monitor the auxiliary power.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	

44	P5			UNIT-2	19	The currents of individual equipment for different plant load may be made available in the control room.		Available in Unit No 3 & 4.Will be made available in Unit 1 & 2 after up gradation of east package by MAXDNA to be taken in 2012-13	
45	P5			UNIT-2	20	Installation of primary transducers for online recording of Feed water flow, condensate flow, CW flow, air flow through FD and PA fans; O2 in flue gas at APH inlet and outlet.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	
46	P5			UNIT-2	21	Provision for online computation of coal flow for the purpose of calculating SEC by calibrating the Feeder speed.		DPR sent to HO for Gravimetric feeder.	
47	P5			UNIT-2	22	On-line computation of flue gas flow.		Work will be carried out in R&M in FY 15-16	
48	P5			UNIT-2	23	Installation of power transducers for all major HT equipments.		Will be implemented after up gradation of east package in2012-13	
49	P5			UNIT-2	24	On-line computation and monitoring of specific energy consumption for each HT		Procurement planned in 2012-13	

						equipment.			
50	P5			UNIT-3	25	The auxiliary power computation can be made on-line (as followed in Koradi TPS). The computation of auxiliary power for every 15 minutes interval and displayed on the computer screen.	March-11	System installed and trial taken. Data to PCR and OS through lan is in progress.	0
51	P5			UNIT-3	26	The GT secondary energy meter (from GCR) reading may also be incorporated in auxiliary power computation. This will give the total auxiliary power including GT losses.		Spare signal not available with MSETCL. However signal will be made available after installation of check meter by MSETCL. Matter to be taken up with GCR.	
52	P5			UNIT-3	27	The auxiliary power variation with plant load may be plotted and made available at control room for the operator to monitor the auxiliary power.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	
53	P5			UNIT-3	28	The currents of individual equipment for different plant load may be made available in the control room.	Jan-2000	Already available	

54	P5			UNIT-3	29	Installation of primary transducers for online recording of Feed water flow, condensate flow, CW flow, air flow through FD and PA fans; O2 in flue gas at APH inlet and outlet.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	
55	P5			UNIT-3	30	Provision for online computation of coal flow for the purpose of calculating SEC by calibrating the Feeder speed	Jan-2000	Already available	
56	P5			UNIT-3	31	On-line computation of flue gas flow.		Work will be carried out in 12-13	
57	P5			UNIT-3	32	Installation of power transducers for all major HT equipments.		DPR will be prepared by Dec2011.	
58	P5			UNIT-3	33	On-line computation and monitoring of specific energy consumption for each HT equipment.		Procurement planned in 2012-13	
59	P5			UNIT-4	34	The auxiliary power computation can be made on-line (as followed in Koradi TPS). The computation of auxiliary power for every 15 minutes interval and displayed on	March-11	System installed and trial taken. Data to PCR and OS through lan is in progress.	

						the computer screen.			
60	P5			UNIT-4	35	The GT secondary energy meter (from GCR) reading may also be incorporated in auxiliary power computation. This will give the total auxiliary power including GT losses.		Spare signal not available with MSETCL. However signal will be made available after installation of check meter by MSETCL. Matter to be taken up with GCR.	
61	P5			UNIT-4	36	The auxiliary power variation with plant load may be plotted and made available at control room for the operator to monitor the auxiliary power.		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	
62	P5			UNIT-4	37	The currents of individual equipment for different plant load may be made available in the control room.	Jan-2000	Already available	
63	P5			UNIT-4	38	Installation of primary transducers for online recording of Feed water flow, condensate flow, CW flow, air flow through FD and PA fans; O2 in flue gas at APH inlet and		Budgetary offer for transducer measurement received. Proposal will be put by Mar-2011.	

						outlet.			
64	P5			UNIT-4	39	Provision for online computation of coal flow for the purpose of calculating SEC by calibrating the Feeder speed.	Jan-2000	Already available	
65	P5			UNIT-4	40	On-line computation of flue gas flow.		Work will be carried out in 12-13	
66	P5			UNIT-4	41	Installation of power transducers for all major HT equipments.		DPR will be prepared by Dec11.	
67	P5			UNIT-4	42	On-line computation and monitoring of specific energy consumption for each HT equipment.		Procurement planned in 2012-13	
68	P6	5	5	UNIT-1	1	Constant adjustment of spring load setting and roll clearance setting	Jan-2000	Already in practice.	
69	P6			UNIT-1	2	Mill DP measurement must be available for all coal mills to monitor and reduce the mill chocking problem.	Jan-2000	Already available	
70	P6			UNIT-2	3	Constant adjustment of spring load	Jan-2000	Already in practice.	

						setting and roll clearance setting			
71	P6			UNIT-3	4	Constant adjustment of spring load setting and roll clearance setting	Jan-2000	Already in practice.	
72	P6			UNIT-4	5	Constant adjustment of spring load setting and roll clearance setting	Jan-2000	Already in practice.	
73	P7	1	1	STATIO N	1	Present re-order points for the OEM spares may be critically analyzed and fixed in terms of economic order quantity, time delays and consumption rates based on historical data.	01-01-10	OEM list available and updated by maint. sections	
74	P8	30	29	STATIO N	1	Zero ash leak policy may be adopted.	Sep-10	AHP- Already in Practice New pipes received. pipe replacement by used pipes in progress Further Pipe procurement from H.O .is in process	

75	P8			STATION	2	Management of Wet Coal at Hoppers & Chutes – Vibrators using thyristors / solid state technology.		Initially 2 Nos. vibrators will be provided for Conv. 7A discharge chute (i.e. just below F/G-1), After assessing the performance, vibrators for Conv. 7B, 7E & 7F discharge chutes will be installed in phase manner.	
76	P8			STATION	3	Management of Wet Coal at Hoppers & Chutes – Pressurized water jets.	Jan-2000	Already in practice wherever required.	Chute choke up problem is negligible.
77	P8			STATION	4	Management of Wet Coal at Hoppers & Chutes – Re-engineering to widen angle of chute walls .	Jan-2000	Already, following chute walls are widened i.e. discharge chutes of A/F-1 & 2, Conv. 1A/1B, 6A/6B & inlet chutes of Shuttle Conv. 1 to 4.	Chute choke up problem is negligible.
78	P8			STATION	5	Management of Wet Coal at Hoppers & Chutes – Re-engineering to enlarge openings.	Oct-2009	i) Work of enlargement of discharge opening chutes of Conv. 3A/3B & work of enlargement of head end chutes of Conv. 3A/3B, 5A/5B. 6A/6B, 7A/7B & 7E/7F is completed in the month of	Due to these enlargement , unscrapped coal accumulation below snub pulley is reduced and will ultimately results into longer life of

								Sept-09 & Oct-09.	belt conveyor.
79	P8			STATION	6	Management of Wet Coal at Hoppers & Chutes – Deflector plates of low friction flow promoting materials such as SS304 (6-8 mm) or polymeric liners (10-12 mm)	Jan-2000	Deflector plates such as SS-304 (8 mm) & SAIL hard plate (16 mm) are already installed, wherever necessary.	Introduction of deflector plates, resulted in to centre feeding of coal on conveyor belt, thereby running out of conveyor belt is avoided.
80	P8			STATION	7	Management of Wet Coal at Hoppers & Chutes – Sealing of conveyor belt sides between chute and pan of vibrating feeders.	Jan-2000	Belt sides of conveyor chutes are already sealed by using 20 mm thick natural rubber sheet.	As skirt rubber is of lesser shore hardness, conveyor belt does not damaged at sealing (contact) portion. Enhance the life of conveyor belt.
81	P8			STATION	8	Management of Wet Coal at Hoppers & Chutes – Hanging belts in hopper mouths.	Jan-2000	Chute's mouths are already provided with hanging belts.	Reduction in escaping of coal dust from chutes.

82	P8			STATION	9	Management of Wet Coal at Conveyors–Belt scrappers for conveyor belts.	Jan-2000	Belt scrappers are already installed for conv.3A/3B, 4A/4B, 5A/5B & 6A/6B.	Sticky coal accumulation on seal plates of return side of the conveyor belt is reduced.
83	P8			STATION	10	Management of Wet Coal at Conveyors–Adjust skirt board seal of conveyor.	Jan-2000	Adjustable skirt boards are already installed for Conv.7E/7F, 7G/7H. Rest of the conveyor skirt boards are provided with 20 mm thick natural rubber sheet.	As skirt rubber is of lesser shore hardness, conveyor belt does not damaged at sealing (contact) portion. Enhance the life of conveyor belt.
84	P8			STATION	11	Management of Wet Coal at Conveyors–Conveyor baffle plate / centering plate at loading zone and at belt cleaning point.	Sep-2009	Baffle plate were already provided at belt feeder - 1 & 2, Conv. 7E / 7F & 7G/7H. Baffle plates for Boom Conveyor 1 & 2 are provided in the month of Sept-09.	Life of the coal flow side chute plate is increased.
85	P8			STATION	12	Management of Wet Coal at Conveyors – Flow promoting liners of polymer (10-12 mm) or SS 304 (6-8 mm).	Jan-2000	Uncrushed coal chutes are already provided with 6 mm thick SAIL hard liners. However, crusher coal chutes are already	Chute choke up problem is negligible.

								provided with 10/12 mm thick SS-304 & SAIL hard plate.	
86	P8			STATION	13	Management of Wet Coal at Conveyors– Slopes of conveyors restricted to 30°	Jan-2000	Slopes of conveyor is below 17o.	Due to low inclination of conveyor, coal on conveyor is not getting slipped down.
87	P8			STATION	14	Management of Wet Coal at Conveyors – Reduction of belt speed	Jan-2000	Speed of conveyor belt is moderate (i.e. 2.2 to 2.7 mtr/sec).	As the conveyor belt speed is moderate, chute choke up problem are very less.
88	P8			STATION	15	Management of Wet Coal at Wagon Tippler Hoppers– Side build up: mechanical scrapping of sides	Jan-2000	Wagon tippler hoppers are provided with 8 mm thick MS liners & it is a regular practice of timely replacement of liners to avoid the accumulation of wet coal on sides of the hoppers.	In wagon tippler hoppers, wet coal is not sticking to the inner side walls of the hopper.
89	P8			STATION	16	Management of Wet Coal at Wagon Tippler Hoppers – Use of grab cranes to remove or upset the build	01-02-11	Electrical hammers are put in service at wagon tippler as well as at Track Hopper for	Already covered at Sr. No. 20

						up.		breaking coal lumps.	
90	P8			STATION	17	Management of Wet Coal at Wagon Tippler Hoppers – Tippling angle to be increased to 175°	Jan-2000	Present tipping angle is 1700 & wagons are fully getting emptied.	Wagons are getting fully emptied at present tipping angle i.e. 1700
91	P8			STATION	18	Management of Wet Coal at Stock Pile – Pyramidal shape with flat crest.	Jan-2000	Already in practice.	Handling of wet coal problems are eliminated.
92	P8			STATION	19	Management of Wet Coal at Stock Pile – Pile must not have surface depressions or pits.	Jan-2000	Regular compacting is being done with dozer.	Due to compacting of coal pile by dozer, coal not getting very wet due to accumulation of water.
93	P8			STATION	20	Bottom rollers of conveyor belts have to be checked and maintained periodically.	Jan-2000	Freeness of bottom rollers & timely replacement of defective rollers is being closely monitored.	Due to regular checking / replacement of rollers, belt running out problems are minimized & ultimately resulted into reduction in coal spillage.
94	P8			STATION	21	Pressure settings of air compressors need to be checked periodically (may	Jan-2000	Already in practice.	

						be bi-monthly or half yearly).			
95	P8			UNIT-1	22	Generator heat exchanger may be cleaned with high pressure water jet cleaning to improve the heat exchanger effectiveness	Jan-2000	Performance is satisfactory. Regular practice during overhaul	
96	P8			UNIT-1	23	The air leakages at PA fan 1B and PA fan 1F near flange are observed and to be attended.	May-2009	Work completed in May 09	
97	P8			UNIT-1	24	The flue gas leakages observed near man hole of ID fan 1A and to be attended.	Jan-2010	The flue gas leakages are attended near man hole of ID fan 1A during AOH in Jan 10	
98	P8			UNIT-2	25	Generator heat exchanger may be cleaned with high pressure water jet cleaning to improve the heat exchanger effectiveness	Sep-2010	Heat exchangers cleaning done by nylon brushing in COH Sept 2010.	
99	P8			UNIT-2	26	The air leakages at PA fan 2A, 2B, 2D, 2E and 2F near flange are observed and to be attended.	May-2009	The air leakages at PA fans attended in May-2009.	
100	P8			UNIT-2	27	Mill 2A and 2D PC coal leakages at mill outlet are to be attended.	May-2009	Mill 2A and 2D PC coal leakages at mill outlet are attended.	
101	P8			UNIT-2	28	Flue gas leakages near	Aug-2009	Work is completed	

						flange at ID fan 2B are to be attended.		during AOH in Sept10	
102	P8			UNIT-3	29	Generator heat exchanger may be cleaned with high pressure water jet cleaning to improve the heat exchanger effectiveness	Nov-2009	Performance checked. Found normal. Regular practice during overhauls	
103	P8			UNIT-4	30	Generator heat exchanger may be cleaned with high pressure water jet cleaning to improve the heat exchanger effectiveness	Jan-2011	Action plan implemented in COH Jan 2011	
104	P10	22	22	STATION	1	Resource consumption and conservation (coal, oil, DM water make up) is also to be given importance in the operational process.	Jan-2000	Already in practice. For Unit 3 & 4, on line measurement of DM Water, Coal & Oil is available. For Unit 1 & 2, only DM water on line measurement is available. The impact of coal quantity & quality is already available in Performance Evaluation Module. Impact of DM water & oil consumption will be calculated	Will help in reduction in cost of generation

								through on line evaluation package of Generation Control Room after confirmation by IT.	
105	P10			STATION	2	Design profiles may be drawn on the MMI screens and displayed at the time of start-up and shut down operation	Jan-2000	Already available for all Units	
106	P10			UNIT-1	3	Regular venting of air lines in HPH.	Jan-2000	Not required for HPH at Khaperkheda TPS as air vents are connected to deaerator.	
107	P10			UNIT-1	4	Optimizing on the number of starts. Hot/warm/cold starts reduced to 8/2/2 per unit.	Jan-2000	Already in practice.	Improvement in PLF,availability & reduction in resource consumption.

108	P10			UNIT-1	5	The change over of stand-by BFP & CEP has to be carried at regular interval of 21 – 25 days.	Jan-2000	Already in practice as per recommendations	Availability of standby BFP & CEP are increased.(process improvement)
109	P10			UNIT-1	6	The regular interval of 2 – 3 days for change over of stand-by Coal Mill is to be practiced.	Jan-2000	Already is in practice.	Availability of standby coal mills are increased (process improvement)
110	P10			UNIT-1	7	It is to be ensured that the isolation valves of Hot & Cold air dampers to be kept open for mills in service.	Jan-2000	Already being ensured.	Beneficial in maintaining coal mill outlet temperature to designed value. Thus improvement in mill performance. (process improvement)
111	P10			UNIT-2	8	Regular venting of air lines in HPH.	Jan-2000	Not required for HPH at Khaperkheda TPS as air vents are connected to deaerator.	
112	P10			UNIT-2	9	Optimizing on the number of starts. Hot/warm/cold starts reduced to 8/2/2 per unit.	Jan-2000	Already in practice.	Improvement in PLF,availability & reduction in resource consumption.

113	P10			UNIT-2	10	The change over of stand-by BFP & CEP has to be carried at regular interval of 21 – 25 days	Jan-2000	Already in practice as per recommendations	Availability of standby BFP & CEP are increased . (process improvement)
114	P10			UNIT-2	11	The regular interval of 2 – 3 days for change over of stand-by Coal Mill is to be practiced.	Jan-2000	Already is in practice.	Availability of standby coal mills are increased (process improvement))
115	P10			UNIT-2	12	It is to be ensured that the isolation valves of Hot & Cold air dampers to be kept open for mills in service.	Jan-2000	Already being ensured.	Beneficial in maintaining coal mill outlet temperature to designed value.Thus improvement in mill performance (process improvement)
116	P10			UNIT-3	13	Regular venting of air lines in HPH.	Jan-2000	Not required for HPH at Khaperkheda TPS as air vents are connected to deaerator.	
117	P10			UNIT-3	14	All OEM manuals must be thoroughly studied and DON'Ts must be carefully understood and observed. This will avoid long term damage to asset equipment	Nov-2009	Prepared and circulated at site	Improvement in operational process with safety of man & machine

						and irreversible degradation of heat rate which will be costly to reverse.			
118	P10			UNIT-3	15	Optimizing on the number of starts. Hot/warm/cold starts reduced to 8/2/2 per unit.	Jan-2000	Already in practice	Improvement in PLF,availability & reduction in resource consumption.
119	P10			UNIT-3	16	The change over of stand-by BFP & CEP has to be carried at regular interval of 21 – 25 days.	Jan-2000	Already in practice as per recommendations	Availability of standby BFP & CEP are increased (process improvement).
120	P10			UNIT-3	17	The regular interval of 2 – 3 days for change over of stand-by Coal Mill is to be practiced.	Jan-2000	Already is in practice.	Availability of standby coal mills are increased (process improvement).
121	P10			UNIT-3	18	It is to be ensured that the isolation valves of Hot & Cold air dampers to be kept open for mills in service.	Jan-2000	Already being ensured.	Beneficial in maintaining coal mill outlet temperature to designed value.Thus improvement in mill performance (process improvement).

122	P10			UNIT-4	19	Regular venting of air lines in HPH.	Jan-2000	Not required for HPH at Khaperkheda TPS as air vents are connected to deaerator.	
123	P10			UNIT-4	20	The change over of stand-by BFP & CEP has to be carried at regular interval of 21 – 25 days.	Jan-2000	Already in practice as per recommendations	Availability of standby BFP & CEP are increased (process improvement)
124	P10			UNIT-4	21	The regular interval of 2 – 3 days for change over of stand-by Coal Mill is to be practiced.	Jan-2000	Already is in practice.	Availability of standby coal mills are increased(process improvement)
125	P10			UNIT-4	22	It is to be ensured that the isolation valves of Hot & Cold air dampers to be kept open for mills in service.	Jan-2000	Already being ensured.	Beneficial in maintaining coal mill outlet temperature to designed value.Thus improvement in mill performance (process improvement)
126	P11	2	2	STATION	1	Complete details of the training program such as contact persons, contact telephone, postal address, how to reach there, etc., must be given to the trainee well	Jan-2000	The practice is being followed for all outside training programmes, as per circular from HO for E-Mail communication for training programmes.	

						in advance to make the training a memorable experience.			
127	P11			STATION	2	Areas of training must be those which have immediate or very serious relevance to MSPGCL like reduction in auxiliary power, reduction in fuel oil, conservation of DM water, improvements in O & M procedures	Jan-2000	The Water conservation programme in the colony was successfully carried out from 29-12-1009 for a week. Training Course on "Energy Conservation in compressed air systems" is was conducted on 9th & 10th April 10	
128	P12	25	21	STATION	1	The station should avoid procurement of analog stand alone measuring equipment which cannot be seamlessly integrated into a central server and which does not have provision for downloading data into a data base.	Jan-2000	In practice	

129	P12			STATION	2	Automation of operation of conveyor system.	Jan-2000	Operation of conveyor system on both modes i.e. auto & manual is available. However, conveyor system runs on either mode as per the requirement of the plant.	
130	P12			UNIT-1	3	Economizer coils are prone to erosion due to excess fly ash generated due to low-grade coal. The design flue gas velocity at ECO is expected to be in the range of 8.5 to 9.5 m/s. Due to ash accumulation and fouling, the velocities increase to nearly 12 m/s or more resulting in enhanced erosion rates. To reduce erosion, close monitoring of flue gas velocity is needed. Also suitably designed cassette baffles of ceramic/steel with hard overlay may be introduced for reduction of erosion.	Jan-2010	Pre & post CVAT is carried out. Complete replacement of ECO coils is carried out during COH 2009. Coils & Cassette baffles have been replaced.	

131	P12			UNIT-1	4	Up gradation of the APH rotor		Referred to OEM vide letter no. KHG / BM / Corr. 362 / 13416 Dtd.26/10/2009 Reminder vide letter no. KHG/BM/CORR. /2010/336/11898 Dtd. 31/08/10 is sent to M/s. BHELWill be taken in EER&M	0
132	P12			UNIT-1	5	The insulation of the primary and secondary air ducts may be replaced by new unbonded, felted, mineral/rock/slag wool mattresses on need basis.	Jan-2010	The insulation of the primary and secondary air ducts is replaced by new unbonded, felted, mineral/rock/slag wool mattresses.	
133	P12			UNIT-1	6	Strain gauge under the bearing supports of the mill for on- line weight of the mill to indicate the status of the loading of the mill. This practice is used in International practices to know the level of loading rather than other indirect parameters such as mill current and mill	26-07-11	Not feasible with existing mills	0

						differential pressure.			
134	P12			UNIT-1	7	Steam supply system for quenching of mill fires.	Jun-2009	Alternate arrangement is available.	
135	P12			UNIT-1	8	Performance analysis software with provision for data downloadable into a data base and EXCEL sheet can be procured for on- line analysis of performance. The same can also be used for sensitivity analysis of parameter variations for performance improvement. Alternatively, PADO (Performance analysis, diagnostic and optimization) software may be installed typically of BHEL or Teleperm.		Earlier version of PADO i.e. Performance Evaluation Module is already available. Up gradation will be done in 2012-2013	

136	P12			UNIT-1	9	It is suggested to install Fixed capacitor bank of 4.5 MVAR for Station Transformer	26-07-11	The power factor correction and power saving are the main areas on the basis of which the suggestion was given. However if benefits are lower then power factor issue may be absorbed and recommendation may be differed. (Decision as per MOM No.CE/WORKS/ CPRI-Consultation/No.09510 dt.26.07.2011)	0
137	P12			UNIT-2	10	The insulation of the primary and secondary air ducts may be replaced by new unbonded, felted, mineral/rock/slag wool mattresses on need basis.	Nov-2010	The insulation of the primary and secondary air ducts is replaced by new unbonded, felted, mineral/rock/slag wool mattresses.	
138	P12			UNIT-2	11	Strain gauge under the bearing supports of the mill for on- line weight of the mill to indicate the status of the loading of the mill. This practice is used	Jul-2011	Not feasible with existing mills	

						in International practices to know the level of loading rather than other indirect parameters such as mill current and mill differential pressure.			
139	P12			UNIT-2	12	Steam supply system for quenching of mill fires.	01-06-09	Alternate arrangement is available.	
140	P12			UNIT-2	13	Performance analysis software with provision for data downloadable into a data base and EXCEL sheet can be procured for on- line analysis of performance. The same can also be used for sensitivity analysis of parameter variations for performance improvement. Alternatively, PADO (Performance analysis, diagnostic and optimization) software may be installed typically of BHEL or Teleperm.		Earlier version of PADO i.e. Performance Evaluation Module is already available. Up gradation will be done in 2012-2013	

141	P12			UNIT-2	14	It is suggested to install Fixed capacitor bank of 3 MVAR for Station Transformer	26-07-11	The power factor correction and power saving are the main areas on the basis of which the suggestion was given. However if benefits are lower then power factor issue may be absorbed and recommendation may be differed. Decision as per MOM No.CE/WORKS/ CPRI-Consultation/No.09510 dt.26.07.2011	0
142	P12			UNIT-3	15	The insulation of the primary and secondary air ducts may be replaced by new unbonded, felted, mineral/rock/slag wool mattresses on need basis.	Nov-2009	Insulation of the primary and secondary air ducts are replaced by new unbounded, rock wool mattresses	
143	P12			UNIT-3	16	Change over to rotating vane assembly in place of stationary vane assembly.	Jan-2000	Rotary vane wheels already existing.	

144	P12			UNIT-3	17	Strain gauge under the bearing supports of the mill for on- line weight of the mill to indicate the status of the loading of the mill. This practice is used in International practices to know the level of loading rather than other indirect parameters such as mill current and mill differential pressure.	Jul-2011	Not feasible with existing mills	
145	P12			UNIT-3	18	Steam supply system for quenching of mill fires.	01-06-09	Alternate arrangement is available.	
146	P12			UNIT-3	19	Performance analysis software with provision for data downloadable into a data base and EXCEL sheet can be procured for on- line analysis of performance. The same can also be used for sensitivity analysis of parameter variations for performance improvement. Alternatively,		Earlier version of PADO i.e. Performance Evaluation Module is already available. Up gradation will be done in 2012-2013 .HMI system will be installed	

						PADO (Performance analysis, diagnostic and optimization) software may be installed typically of BHEL or Teleperm.			
147	P12			UNIT-3	20	It is suggested to install Fixed capacitor bank of 2 MVAR for Station Transformer	26-07-11	The power factor correction and power saving are the main areas on the basis of which the suggestion was given. However if benefits are lower then power factor issue may be absorbed and recommendation may be differed. (Decision as per MOM No.CE/WORKS/ CPRI-Consultation/No.09510 dt.26.07.2011)	0
148	P12			UNIT-4	21	During the next overhaul, restoration of the clearance between fan impeller blades & casing during an outage is recommended. As a preventive measure, it is	Jan-2000	Already in practice.	

						recommended to go for Chrome Carbide weld overlay to fill the damaged portions, so that its performance will not deteriorate over a period 5 to 6 years.			
149	P12			UNIT-4	22	Change over to rotating vane assembly in place of stationary vane assembly.	Jan-2000	Rotary vane wheels already existing.	
150	P12			UNIT-4	23	Strain gauge under the bearing supports of the mill for on- line weight of the mill to indicate the status of the loading of the mill. This practice is used in International practices to know the level of loading rather than other indirect parameters such as mill current and mill differential pressure.	Jul-2011	Not feasible with existing mills	
151	P12			UNIT-4	24	Steam supply system for quenching of mill fires.	01-06-09	Alternate arrangement is available.	

152	P12			UNIT-4	25	It is suggested to install Fixed capacitor bank of 2 MVAR for Station Transformer	Jul-2011	The power factor correction and power saving are the main areas on the basis of which the suggestion was given. However if benefits are lower then power factor issue may be absorbed and recommendation may be differed. (Decision as per MOM No.CE/WORKS/ CPRI-Consultation/No.09510 dt.26.07.2011)	0
153	P13	43	42	STATION	1	Shift-wise feedback to operations group is required to track and control performance levels of each unit.		Shift-wise feedback to operations group will be given after establishment of independent POG cell	
154	P13			STATION	2	Controlling of CW flows for individual pumps.	Jan-2000	It is our regular practice during winter season only 3 CW pumps were running instead of 4 pumps for 2 Units & no flow throttling facility is available.	Reduction in aux. consn.

155	P13			STATION	3	Reducing CT fan motor voltages to rated voltage.	Aug-2010	Checked voltages found as per the rated voltages	
156	P13			STATION	4	The voltage at motor terminals is slightly on higher side and higher voltage will strain the motor insulation	Oct-2009	Voltage at motor terminals are measured & necessary corrective action is taken in the month of Oct-09.	
157	P13			STATION	5	The average running hours of CHP is 18 - 20 hours per day	Jan-2000	The average running hours of CHP are 14-15 hours per day & for further optimization, conveyor coal loading is being closely monitored.	0
158	P13			STATION	6	The specific energy consumption of CHP, crushers and conveyor system is slightly on higher side	Apr-2009	Loading is optimised & specific energy consumption is monitored on daily basis.	
159	P13			STATION	7	Operating the CHP near to its full capacity and regular preventive maintenance schedule for CHP will reduce the SEC	Apr-2009	Loadability is being closely monitored. For the last 6 months, monthly specific energy consumption of CHP has reduced from 1.466 to 1.221 KWH/MT of coal received.	

160	P13			STATION	8	Operation of clear water pumps may also be optimized based on the number of units in service.	Jan-2000	Already in practice. A special care is taken when Unit No. 1 or 2 is under shutdown. Record of clear water pumps (HP) running hours is maintained.	Reduction of clear water pump running hrs observed
161	P13			STATION	9	Non-return valves of air compressors have to serviced.	Jan-2000	Already in practice.	
162	P13			STATION	10	Air leaks in compressors and piping system have to be checked and leakages have to be arrested.	Jan-2000	Already in practice.	
163	P13			UNIT-1	11	During a shut down, before cleaning and clearing of the debris a clean air velocity test may be conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it may be ensured that the velocities are within 8.5 to 9.5 m/s. This is being followed	Jan-2000	During a shut down, before cleaning and clearing of the debris a clean air velocity test is conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it is ensured that the velocities are within 8.5 to 9.5 m/s.	

						by the station.			
164	P13			UNIT-1	12	The measures for the primary and secondary APH are as follows: Renewal of radial and axial seals during an outage APH water washing Adjustment of radial sector plates to maintain gap	Jan-2000	Already in practice.	
165	P13			UNIT-1	13	Arresting of steam leaks from soot blower and auxiliary steam lines typically at flanges, valve stems, etc.	Jun-2009	Attended	
166	P13			UNIT-1	14	Steam loss in areas outside the unit area such as oil tank heating, oil line tracing, may be curtailed by plugging uncontrolled	Jan-2010	Steam loss in areas outside the unit area such as oil tank heating, oil line tracing, are attended.	

						losses. Steam losses are seen at a number of locations in the oil plant.			
167	P13			UNIT-1	15	Insulation of steam lines by 50 mm unbonded, felted, inorganic based mineral / rock / slag wool of thermal conductivity followed by MS pipe skin cladding. The insulation is damaged at many locations in the boiler gallery and at the oil plant.	Jan-2010	Insulation is provided to steam lines by 50 mm unbonded, felted, inorganic based mineral / rock / slag wool of thermal conductivity followed by MS pipe skin cladding.	
168	P13			UNIT-1	16	a) Check the passing in BFP re-circulation by-pass valve by conducting the test. b) Reducing the specific energy consumption of unit. c) Overhauling of pump and checking the clearances between impeller and casing.	Jan-2010	Action plan is prepared for the work during Unit 1 OH in Jan. 2010	

169	P13			UNIT-1	17	Wind box DP may be optimized to reduce the furnace ingress.	Jan-2010	Wind box DP is optimized to reduce the furnace ingress. Repairs of wind box & servicing of Aux. dampers carried out during AOH in Jan 10	
170	P13			UNIT-1	18	It is suggested to overhaul the motor of PA fan 1C and check the winding resistance and no load current during overhaul.	Jan-2010	PA Fan-1C motors winding resistance & inductance measured in Sept 09 & found normal	0
171	P13			UNIT-2	19	During a shut down, before cleaning and clearing of the debris a clean air velocity test may be conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it may be ensured that the velocities are within 8.5 to 9.5 m/s. This is being followed by the station.	Oct-2010	During a shut down, before cleaning and clearing of the debris a clean air velocity test is conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it is ensured that the velocities are within 8.5 to 9.5 m/s.	

172	P13			UNIT-2	20	The measures for the primary and secondary APH are as follows: Renewal of radial and axial seals during an outage APH water washing Adjustment of radial sector plates to maintain gap	Jan-2000	Already in practice.	
173	P13			UNIT-2	21	The LP heater drain temperature and pressure need to be maintained as per design through performance trending.	Sep-2010	LPH-3 Tube bundle replaced. LPH-2 tube leakages detected. Leaking tube dummied. Paring plane refurbishement done in COH Sept 2010..	
174	P13			UNIT-2	22	Arresting of steam leaks from soot blower and auxiliary steam lines typically at flanges, valve stems, etc.	Jan-2000	Already in practice.	
175	P13			UNIT-2	23	Steam loss in areas outside the unit area such as oil tank heating, oil line tracing, may be curtailed by plugging uncontrolled losses. Steam losses are seen at a number of	Jan-2000	Already in practice.	

						locations in the oil plant.			
176	P13			UNIT-2	24	Insulation of steam lines by 50 mm unbonded, felted, inorganic based mineral/rock/slag wool of thermal conductivity followed by MS pipe skin cladding. The insulation is damaged at many locations in the boiler gallery and at the oil plant.	Oct-2010	Insulation is provided to steam lines by 50 mm unbonded, felted, inorganic based mineral / rock / slag wool of thermal conductivity followed by MS pipe skin cladding.	
177	P13			UNIT-2	25	MS / RH pipe cladding is not present in many places. Cladding of piping is bare in open areas which is exposed to rains resulting in secondary damage to insulation through soaking. Recommendation : Restoration of insulation and cladding at appropriate places in the MS and RH lines. Or else roofing similar to Units 3 & 4 may be used	Oct-2010	Work carried out during AOH in Sept 10	

						to avoid ingress of water / rain water damaging insulation.			
178	P13			UNIT-2	26	Skin cladding sheet at 54 m back and rear walls is damaged. Cladding sheets of 30-35 m elevation is damaged. Recommendation: Restoration of skin insulation of the boiler at 30 % of the area.	01-10-10	Work carried out during AOH in Sept 10	
179	P13			UNIT-2	27	Cladding around soot blowers 1,2,3 is damaged and need to be restored. Near soot blower line SB 16 at 29.5 m elevation, insulation of two steam lines is damaged. Cladding of ECO inlet line near ECO inlet is damaged. Ejector steam line insulation and cladding is damaged.	Oct-2010	Work carried out during AOH in Sept 10	

180	P13			UNIT-2	28	a) Check the passing in BFP re-circulation by-pass valve by conducting the test. b) Reducing the specific energy consumption of unit. c) Overhauling of pump and checking the clearances between impeller and casing.	Oct-2010	Revisioning of BFP RV in COH Sept 2010 carried out	
181	P13			UNIT-2	29	It is suggested to overhaul the motor of PA fan 2E and check the winding resistance and no load current during overhaul.	Oct-2010	Motor overhauled in Sept 2010	0
182	P13			UNIT-3	30	During a shut down, before cleaning and clearing of the debris a clean air velocity test may be conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it may be ensured that the velocities are	Nov-2009	Pre & post CAVT for measurement of flue gas velocity & installation of expanded metal screens to control the erosion & to achieve smooth flow gas configuration with optimum velocity is carried out.	

						within 8.5 to 9.5 m/s. This is being followed by the station.			
183	P13			UNIT-3	31	The measures for the primary and secondary APH are as follows: Renewal of radial and axial seals during an outage APH water washing Adjustment of radial sector plates to maintain gap	Jan-2000	Already in practice. Checked during AOH in May 11	
184	P13			UNIT-3	32	Arresting of steam leaks from soot blower and auxiliary steam lines typically at flanges, valve stems, etc.	Jan-2000	Already in practice.	
185	P13			UNIT-3	33	Steam loss in areas outside the unit area such as oil tank heating, oil line tracing, may be curtailed by plugging uncontrolled losses. Steam losses are seen at a number of locations in the	Jan-2000	Already in practice.	

						oil plant.			
186	P13			UNIT-3	34	Insulation of steam lines by 50 mm unbonded, felted, inorganic based mineral/rock/slag wool of thermal conductivity followed by MS pipe skin cladding. The insulation is damaged at many locations in the boiler gallery and at the oil plant.	Nov-2009	Insulation is provided to steam lines by 50 mm unbonded, felted, inorganic based mineral / rock / slag wool of thermal conductivity followed by MS pipe skin cladding.	
187	P13			UNIT-3	35	a) Check the passing in BFP re-circulation by-pass valve by conducting the test. b) Reducing the specific energy consumption of unit. c) Overhauling of pump and checking the clearances between impeller and casing.	Nov-2009	Internal energy audit is carried out. BFP 3C efficiency found low. Action plan is prepared and cartridge replaced in Mar 11.	
188	P13			UNIT-3	36	Wind box DP may be optimized to reduce the furnace ingress.	Nov-2009	Repairs of wind box & servicing of Aux. dampers is carried out	

								during OH .	
189	P13			UNIT-4	37	During a shut down, before cleaning and clearing of the debris a clean air velocity test may be conducted to confirm the velocity profile in the ECO in the running condition. After clearing of all debris and fouling, the same may be repeated and it may be ensured that the velocities are within 8.5 to 9.5 m/s. This is being followed by the station.	Jan-2000	Pre & post CAVT for measurement of flue gas velocity & installation of expanded metal screens to control the erosion & to achieve smooth flow gas configuration with optimum velocity is carried out.	
190	P13			UNIT-4	38	The measures for the primary and secondary APH are as follows: Renewal of radial and axial seals during an outage APH water washing Adjustment of radial sector plates to maintain gap	Jan-2000	Already in practice.	
191	P13			UNIT-4	39	Arresting of steam leaks from soot blower	Jan-2000	Already in practice.	

						and auxiliary steam lines typically at flanges, valve stems, etc.			
192	P13			UNIT-4	40	Steam loss in areas outside the unit area such as oil tank heating, oil line tracing, may be curtailed by plugging uncontrolled losses. Steam losses are seen at a number of locations in the oil plant.	Jan-2000	Already in practice.	
193	P13			UNIT-4	41	Insulation of steam lines by 50 mm unbonded, felted, inorganic based mineral/rock/slag wool of thermal conductivity followed by MS pipe skin cladding. The insulation is damaged at many locations in the boiler gallery and at the oil plant.	Jan-2011	Insulation is provided to steam lines by 50 mm unbonded, felted, inorganic based mineral / rock / slag wool of thermal conductivity followed by MS pipe skin cladding.	
194	P13			UNIT-4	42	a) Check the passing in BFP re-circulation by-pass valve by conducting the test. b) Reducing the specific energy consumption of	01-01-11	Action plan implemented in COH Jan 2011	

						unit. c) Overhauling of pump and checking the clearances between impeller and casing.			
195	P13			UNIT-4	43	Wind box DP may be optimized to reduce the furnace ingress.	Jan-11	Repairs of wind box & servicing of Aux. dampers carried out during AOH .	
196	P14	3	2	STATION	1	Monthly air / water cleaning of boiler, galleries and surrounding areas can be considered.	Jun-2009	Cleaning of Unit -1, 2 & 4 is carried out on 29-06-2009, 09-07-2009 & 31-07-2009 resp. Unit-3 carried on 11-08-2009.Regular practice	
197	P14			STATION	2	Cleaning coal from bottom of conveyor belts to reduce SEC.	Apr-2009	Deck plate as well as idlers are made free of coal and is being closely monitored.	
198	P14			UNIT-1	3	Pressurization of turbine area to avoid dust in turbine floor.		Present turbine house design has already taken care of dust ingress and modification is restricted due to structural constraints. Hence recommendation is deferred for implementation. (Decision as	

								per MOM No.CE/WORKS/ CPRI-Consultation/No.09510 dt.26.07.2011)	
	Total	**198**	**158**				**158**		