Annex – 3
(Immediate measures without financial implication)

Table 1: KhTPS status of CPRI recommendation immediate term without financial implications.

Project Code	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
P1	1	STATION	1	An all MSPGCL coal data base may be evolved giving mine wise station wise data of coal.	Sep-2011	Will be covered in SAP ERP	
P2	1	STATION	1	Measurement of Ash to Water ratio on daily basis.	Apr-2009	Implemented w.e.f. May-2009	
P3	1	STATION	1	All attempts may be made by the Fuel Cell to increase the coal quality to the mid-point or above of the grade band.	Jan-2008	All possible efforts are made	
P5	4	STATION	1	Recommendations of the performance optimization group for proactive parameter setting are required for optimization of the unit performance.	Jan-2000	Already in practice	
P5		STATION	2	The data recorded in each shift by the Chemists must be used for Performance Optimization.	Jan-2000	Already in practice	Improvement in operational efficiency (process improvement)
P5		STATION	3	The monthly data submitted to HO and to Regulatory Commission must also give the unit test heat rate and station test heat rate obtained by testing the unit on average coal and obtained through online heat rate monitoring	Jan-2000	Already in practice. Unit test is being carried out once in a month & is submitted to RC, HO during submission of ARR.	

				software.			
P5		STATION	4	The monthly data submitted to HO and to Regulatory Commission must also give the unit test heat rate and station test heat rate obtained by testing the unit on average coal and obtained through online heat rate monitoring software.	Jan-2000	At the time of APR submission, the data is given to RCD. Also monthly Efficiency Test results are conveyed to CGM (Works).	
P7 P7	10	STATION	1	Inventory control software to control the costs on account of the movement of spares.	Dec-2009	This Software is developed and used by BM & TM. Exact requirement will be covered in SAP/ERP.	01-04-2010
P7		STATION	2	The minimum level, maximum level and re-order levels must be constantly optimized, revised based on dynamic data analysis and review of requirement through inventory control software resources.	Dec-2009	This Software is developed by MIS and used by BM & TM ,same will be covered in SAP	
P7		STATION	3	For many items rate contract can be entered into for a yearly basis to minimize inventory levels.	Jan-2000	Already in practice	
P7		STATION	4	Vendors must be free to register or apply for registration with MSPGCL either online or offline at any point of time.	Sep-2009	e-Tendering is started.	

P7		STATION	5	The capacity of the Contractors must be critically examined in the areas of maintenance works so that the work may be given to multiple agencies for completion of similar jobs faster.	Jan-2000	Already in practice	
P7		STATION	6	For special components which are posing difficulty in obtaining spares, competent agencies for reverse engineering should be identified.	Jan-2000	Already in practice	
P7		STATION	7	Utility-academic-vendor initiative or innovative solutions to the TPS problems	Jan-2000	Already in practice	
P7		STATION	8	5 year rolling plan for maintenance should be got approved in one go rather in yearly instalments	Sep-2009	Accepted will be implemented from 2010-11	
P7		STATION	9	For essential OEM maintenance spares of a critical nature, 5 years rolling plan may be made and put up for approval in one go. The process may be simplified.	Mar-2010	Comprehensive 5 Year Rolling Plan submitted to H.O. in March-2010 & is being monitored.	
P7		STATION	10	Simplification of purchase process through planning functions.	Sep-2010	Will be covered in SAP	
P8	9	STATION	1	Condition based predictive maintenance must be substituted for routine maintenance	Jan-2000	In practice	
P8		STATION	2	Reliability and risk indices of equipment must be worked out in formulating maintenance strategy	Jan-2000	History register of critical equipments is maintained & accordingly, Reliability and Risk indices are worked out.	

P8		STAT ION	3	Each and every maintenance action must be reviewed and unnecessary planned scheduled maintenance frequency may be modulated based on reliability and risk indices.	Jan-2000	Unnecessary planned schedule maint. is already reduced. History Record Updated	
P8		STAT ION	4	Analysis of forced outages and equipment failures, development of a knowledge base of these and conversion of the knowledge base into a learning experience with horizontal and vertical penetration	Jan-2000	Already in practice. Tripping / Outages Analysis Reports of last five years in the form of Booklets circulated to all Operation & Maintenance sections.	Improvement in operational efficiency and knowledge
A		STAT ION	5	Multiple tier decisions resulting in frequent changing of the R & M plans must be avoided.	Jan-2009	Five year rolling plan prepared	
P8 P8		STAT ION	6	Capex budget scheme may be utilized better for renovation and modernization of old equipment, components, sub-systems and systems.	Jan-2000	Already in practice. Capital Budget is utilised for R & M of Equipments.	
P8 P8		STAT ION	7	R & M schemes must be aligned to performance improvement	Jan-2000	In practice	
P8		STAT ION	8	Check end termination temperatures for all electrical joints	Jan-2000	In practice	

P8		STATION	9	Strengthening and Improving the maintenance practices at CHP	Aug-2009	1) Cleaning is improved, (2) Scrappers are working properly, (3) P.M. is carried out as per schedule.	System availability is increased.
P9	5	STATION	1	Trend analysis of coal may be performance by the Coal Handling Plant which can be used as an input for more meaningful load predication for ABT.	Jan-2000	In practice	
P9 P9		STATION	2	As is followed in stations In USA and Europe, the previous years data on the same day may be used as in input for load prediction ABT	Sep-2011	Covered in SAP/ERP	
P9		STATION	3	In MOD, costs may be further refined / fine tuned by more accurate data.	Sep-2011	Package is developed &is used by GCR.	

P9		STATION	4	GCR working needs to be strengthened in respect of heat rate and its financial impact on realistic basis.	Oct-2011	Package is developed &is used by GCR. Impact of various Operational parameters on heat rate is circulated to all PCR	
P9		STATION	5	Trend analysis of coal may be performance at Corporate level which can be used as an input for more meaningful load predication for ABT.	Jan-2000	In practice	
P10	12	STATION	1	Booking of generation loss in appropriate category by Operation Head for effective analysis of root cause.	Jan-2000	Already in practice	Improvement in plant performance by taking corrective action against the booked generation loss.
P10		STATION	2	Increasing FD fan discharge pressure.	Nov-2009	For Unit 1 & 2, it is as per air flow curve. For Unit 3 & 4, discharge pressure checked and correction carried out during AOH of U3 &U4	
P10		UNIT-1	3	Exercising of variable and sliding pressure operation option of unit	Sep-2010	Sliding pressure mode is exercised at partial loading	

P10		UNIT-1	4	Increase the PA fan discharge pressure near to the design value	Feb-2010	Secondary & Cold air dampers checked during overhaul and by attending air leakages of casing & duct.	
P10		UNIT-2	5	Tilting mechanism to be operated in the gang mode.	Jan-2000	Tilting mechanism is already in gang mode.	Improvement in reheat temperature control. (process improvement)
P10		UNIT-2	6	All OEM manuals must be thoroughly studied and DON'Ts must be carefully understood and observed.	Jan-2000	Prepared & circulated at site	Improvement in operational process with safety of man & machine
P10		UNIT-3	7	Available provision for variable pressure operation (VPO) may be exercised.	Aug-2009	Unit put on sliding pressure mode on 19/08/2009	
P10		UNIT-3	8	Provision for rolling of the turbine through ATRS to be exercised.	Jan-2000	Rolling through ATRS is done regularly.	
P10		UNIT-4	9	Minimizing energy for hot, warm and cold starts to 1, 2, 3 kcal/kWh respectively	Jan-2000	Monitoring & Recording is being done.	
P10		UNIT-4	10	Minimizing the number of hot / warm / cold starts to 8 / 2 / 2	Jan-2000	Already in practice.	Improvement in PLF, availability & reduction in resource consumption.
P10		UNIT-4	11	Provision for sliding pressure operation is available and to be exercised.	Feb-2011	Unit put on sliding pressure mode on 15/02/2011.	
P10		UNIT-4	12	Provision for rolling of the turbine through ATRS exists and may be	Feb-2011	Rolling done through ATRS since	

				exercised. Turbine rolling must only be through ATRS.		15/02/2011.	
P11	2	STATION	1	The topics chosen for in-house training appear to be random topics and do not show any focus. Objective oriented topics must be chosen based on actual need for training in certain areas where knowledge is required to be imparted.	Dec-2009	In the Training Calendar for 2010-11, training on technical subjects for engineers & artisans are planned. These are planned to be covered with specific objectives. This is apart from the objective oriented courses on Energy Conservation & Reliability Centred Maintenance.	
P11		STATION	2	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 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.	

P12	1	STATION	1	While procuring replacement spares, material up gradation and new technology options must be kept in mind instead of old time tested spares.	Jan-2000	In practice	
P13	10	STATION	1	Effectiveness of the overhaul should be evaluated through performance testing before and after an AOH using the same type of coal and the results should be archived.	Jan-2000	Already in practice. Same type of Coal will be ensured in future for tests before & after AOH.	
P13		STATION	2	Transformer management of ESP TR & CT TR.	May-10	One no. of Transformer made off with load shifted to another one. However, unloaded transformer kept charged to maintain oil parameters and healthiness as a stand by in the event of another transformer failure.	Experiment done in Unit-4. Observations are as below - 1) ESP Transformer 1 No. unloaded and load shifted on other transformer. There is immeasurable effect. 2) In case of failure of charged transformer, emission will be high which is not allowed as per MPCB norms.
P13		STATION	3	Overhauling PA fan motors to reduce the current unbalance between 3-phases	Nov-09	CTs checked by Testing in Bus Shutdown. Motors Winding resistance &	

						inductance are checked & found normal.	
P13		STATION	4	Operating 75% of CT fans during Winter season.	Jan-2000	Already in practice.	Reduction in aux. consn.
P13		STATION	5	Operating single CW pumps during winter season	Jan-2000	Already in practice. Design is 2 CW pumps per unit. 3 CW pumps are kept in service instead of 4 CW pumps in winter season for 2 Units.	Reduction in aux. consn.
P13		UNIT-1	6	Transformer management of ESP TR & CT TR.	May-2010	Experiment done in Unit-4. Observations are as below - 1) ESP Transformer 1 No. unloaded and load shifted on other transformer. There is immeasurable effect. 2) In case of failure of charged transformer, emission will be high which is not allowed as per MPCB norms.	0
P13		UNIT-2	7	Transformer management of ESP TR & CT TR.	May-2010	Experiment done in Unit-4. Observations are as below - 1) ESP Transformer 1 No. unloaded and	0

						load shifted on other transformer. There is immeasurable effect. 2) In case of failure of charged transformer, emission will be high which is not allowed as per MPCB norms.	
P13		UNIT-3	8	Transformer management of ESP TR & CT TR.	May-2010	Experiment done in Unit-4. Observations are as below - 1) ESP Transformer 1 No. unloaded and load shifted on other transformer. There is immeasurable effect. 2) In case of failure of charged transformer, emission will be high which is not allowed as per MPCB norms.	0
P13		UNIT-4	9	Transformer management of ESP TR & CT TR.	May-2010	1) ESP Transformer 1 No. unloaded and load shifted on other transformer. There is immeasurable effect. 2) In case of failure of charged	1) ESP Transformer 1 No. unloaded and load shifted on other transformer. There is immeasurable effect. 2) In case of

						transformer, emission will be high which is not allowed as per MPCB norms.	failure of charged transformer, emission will be high which is not allowed as per MPCB norms.
P13		STATION	10	Capital budget should be linked to business strategy.	Jan-2009	Already in practice.(Discussed in meeting on29.12.11)	
P13		STATION	11	Previous/historic efficacy of funding vis-à-vis performance may be compared for present year's allotment.		Policy matter. Referred to HO	
P14	3	STATION	1	The cleanliness levels in the boiler and turbine galleries need to be improved at all elevations by removal of debris of the repair works.	Apr-2009	Debris of the repair works at all elevations removed & cleanliness levels improved.	
P14		UNIT-1	2	Covering of trucks and ash filing should be covered / leak proofed to avoid dispersion of dust	Jan-2000	Already in practice	
P14		UNIT-4	3	Improvement in cleanliness levels in the boiler and turbine area to prevent secondary damage.	May-2009	Necessary efforts are made.	