Annex – 4
(Immediate measures with financial implication)

Measures implemented

Sr. No.	volume	Recommendations	Action plan / Present status / comment	Effects / Results / Improvements seen
1	NTPS_VOL1, PAGE-7,S.N.-1	Installation of belt weighers for all coal conveyors together with instrumentation for integration and measurement of unit wise bunkered coal	Material Received on Dtd. 24.09.09	Bunkered Coal Feed Measurement/ Weighment is achieved.
2	ALL UNITS_VOL3, PAGE-6,S.N.-24	Arresting leakages in Mills.	Leakages are attended during outage of mills. Already in Practice at NTPS	Coal mill environment is improved.
3	NTPS_VOL1, Page-8, S.N.-13	Ultrasonic level indicators for all fuel oil tanks	Scheme is implemented	Accurate Measurement of FO consumption for station achieved
4	NTPS_VOL1, Page-16, S.N.-97	Ready reckoner books of 100-150 pages books may be brought out for Units 1-5 in sufficient copies and distributed to operation and maintenance staff.	To be implemented	Hard Copies are available & circulated to sections. Soft copy data is available in LAN.
5	NTPS_VOL1, Page-12, S.N.-32	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.	Already in Practice at NTPS & Implemented. for HP Hers procurement, Stage-2, LP heater tube nest material change from admiralty brass to copra nickel 90/10.	Life is enhance . Plugging of the tubes reduced.
6	NTPS_VOL1, Page-13, S.N.-55	"Zero coal leak tolerance" policy	Zero coal leakage policy prepared .Schedule of replacement of coal pipes will be prepared before developing leakages.	Coal mill bay Environment improved .Fire chances due to coal leakages reduced to NIL.
7	VOL3_U1,2,3,4,5 Page- 6, S.N.-11	Check the end termination temperatures for all joints	Preparation of Schedule for Checking the end termination temperatures for all joints is in practice from Feb 2010.	No abnormal occurrences / failure since Feb 2010

8	VOL2_U1,2,3,4,5 Page- 7, S.N.-10	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.	Implemented.	ID fan loading improved
9	VOL2_U1,2,3,4,5 Page- 8, S.N.-20	Zero coal leak policy may be incorporated to prevent loss of pulverized coal	Zero coal leakage policy prepared .Schedule of replacement of coal pipes will be prepared before developing leakages. Pl.refer Sr.No.20.	Coal mill bay Environment improved .Fire chances due to coal leakages reduced to NIL.
10	VOL2_U1,2, Page-9, S.N.-36	Repair and check of hangers and supports	Already in Practice at NTPS during AOH of Unit	Unit-3,4,5 load hangers healthiness improved.
11	VOL2_U1,2, Page-9, S.N.-38	Polyglass coating of the condenser water boxes.	During AOH of The Unit NO.5 One Water box coating done with chemical resistance coating	Erosion /Corrosion of the Water Box stopped . Life of the equipment improved.-
12	VOL2_U3 Page- 9, S.N.-31	Replacement of tube nest of LP heater 3, and Main ejector 3 B	1) LP Heater No.3 Tube nest Replaced On 20.03.11 2) Main ejector Tube nest replacement taken under DPR. DPR Scheme Status 1) Offer called from OEM BHEL After receipt Proposal will be submit.	Condensate water Temp. After LPH-3 Improved by 25 C.
13	NTPS_VOL1, Page-15, S.N.-96	Video conference facilities of MSPGCL to be put to effective usage for HO-station and Station to station meetings/discussions.	Already Implemented. and is in service.	-
14	NTPS_VOL1, Page-16, S.N.101	Simulator training must be repeated once in 6 months with new learning of fault simulation topics/situations. Under the scheme of training sub center the simulator courses are to be conducted at Power Stations,, the process of approval of budget for TSC is under progress.	Simulator Training is available at NGTC, Whenever the courses are arranged participants are being deputed.	It has helped participants to refresh the knowledge of systems in TPS
15	NTPS_VOL3, Page-7, S.N.12	Overhauling of H_2 Booster pump and DM/GS pump 2 to avoid overloading	DM/DM pump No.2 of complete overhauling done.H_2 cooler booster pump Discharge valve throttled.	Stage-2, DM/DM pump no.2 loading reduced from 80 A. To 60 A. H_2 Booster Pump loading reduced

				from 156 A to 130 A.
16	NTPS_VOL3, Page-7, S.N.-11	Arresting air leakages and flue gas leakages in ducts	Already in Practice at NTPS during and short outages and AOH	Implemented.. Loading of Fans reduced.
17	VOL2_U1,2,3,4,5, Page- 7, S.N.-12	Performance optimization software	will be implemented in GCR Project & DCS (U3 & U5)	
18	VOL2_U1,2,3,4,5, Page- 7, S.N.-15	Burner mouth panels may be inspected during each outage and surface replenished periodic intervals.	Already in Practice at NTPS	-
19	VOL2_U1,2,3,4,5, Page- 8, S.N.-18	Need based insulation replacement during overhaul	Already in Practice at NTPS	-
20	VOL2_U1,2, Page-8, S.N.-27	Overhauling of hydrogen cooler to maintaining the cold gas temperature near to design value	Deferred	-
21	VOL2_U3, Page-6, S.N.-2	Condenser acid tube cleaning followed by bullet shot cleaning followed by Condenser tube surface painting by brushable ceramic coating	Unit 3 : 1) During COH From-08.06.09 to 14.07.09. And AOH July-11 . Condenser acid cleaning, bullet shot, jetting done. Surface plate coating done. Vacuum improved from 620 to 655 at full load and maintaining .There is no loss on vacuume.Unit 4 : 1) During AOH From-15.09.10 to 16.11.10 Condenser acid cleaning ,bullet shot,jetting done. Surface plate coating done. Vacuum improved from 620 to 655 at full load and maintaining .There is no loss on vacuum. 2) During AOH of Sept -11 Only Jetting of the condenser done. Vacuum improved from 625 to 655 at full load and maintaining. Unit 5: 1) During AOH From-25.11.09 to 22.12.09 Condenser acid cleaning ,bullet shot,jetting done. Surface plate coating done. Vacuum improved from 618 to 655 at full load and maintaining . 2) During Short Shutdown from 09.01.12 to 14.01.12 Jetting of the condenser done. Vacuum improved from 608 to 655 at full load. Reading Noted on 17.01.12 at 18 hrs load 210 Mw Vacuume-660 MM of HG	Vacuum improved from 625 to 660 mm of hg.

22	VOL2_U3,5, Page-8, S.N.-25	Rectification of temperature indicators of cold gas temperature and overhauling of hydrogen cooler	Already in Practice at NTPS Implemented.. To Be Considered as NFI	-
23	VOL3_U5, Page-7, S.N.-19	Avoiding overloading of H_2 booster pump 1, DM water pump & PCR AC compressor	EM: Motor Overloading is avoided by throttling DV. Higher capacity(110 kW instead of 90 kW) motor procurement proposal is under process. TM:Overhauling of the Auxiliaries carried out Loading reduced . Pumps running normal	EM: Motor Overloading is avoided by throttling DV. Higher capacity(110 kW instead of 90 kW) motor procurement proposal is under process. TM: Overhauling of the Auxiliaries carried out Loading reduced . Pumps running normal
24	VOL2_U4,5, Page-7, S.N.-13	Main ejector nozzle and diffuser replacement.	Unit 4: Both Ejector Nozzle and Diffusers Replaced.1) Main Ejector A Tube Nest , Nozzle and Diffusers Replaced in AOH March-April -2007. 2) Main Ejector B Nozzle and diffusers Replaced in AOH Nov-2010.Unit 5: 1) During AOH From- 25.11.09to 22.12.09. Main Ejector A Nozzles replaced . And Main Ejector B Nozzles with Diffusers replaced	Performance of the ejectors improved. Steam consumption reduced as pressure required from 7.5 kg/cm^2 to 6 kg/cm^2 for maintaining vacuum.
25	NTPS_VOL3, Page-9, S.N.-4	Improving the BFP efficiency by overhauling of pump & motors	EM : Motors OH is planned in phase manner in as per availability of BFP Motor .TM: Unit 3 : 1) BFP 3C overhauled. Cartridge replaced with repaired cartridge During COH Jun-July-09. Performance improved pump amp. Reduced by 20 amp.at same flow Unit4: 1) BFP 4B overhauled. Cartridge replaced with repaired cartridge in the month of Nov.-10 Performance improved pump amp. Reduced by 20 amp.at same flow. Compared with other pump & previous data of the pump. Unit 5 : 1) BFP 5C overhauled. Cartridge replaced with repaired cartridge in the month of Oct-2011 Performance improved pump amp. Reduced by 20 amp.at same flow. Compared with other pump & previous data of the pump.	EM : Due to Overhauling, healthiness of motor is ensured.. TM : Performance & Availability improved

26	NTPS_VOL3, Page-9, S.N.-5	Improving the CEP efficiency by overhauling of pump & motors	EM : Motors OH is planned in phase manner in as per availability of CEP Motor TM : 1) CEP 3C overhauled in Aug-11. Mechanical seal cartridge type Designed by EBIPL installed . Pump is in service from August-11 .	EM : Due to Overhauling, healthiness of motor is ensured. TM : Performance & Availability improved
27	NTPS_VOL3, Page-9, S.N.-6	Reducing the air ingress in flue gas duct between APH to ID outlet	Unit-3,4,5-Flue gas duct leakages are attended in every short shut down of units. Extensive works will be taken during Forthcoming AOH	ID loading reduced.
28	NTPS_VOL3, Page-9, S.N.-7	Reducing flue gas pressure across APH	Cleaning of APH baskets by high pressure jet in each unit AOH.	Diff.pressure reduced due to choke up removal of baskets.
29	NTPS_VOL3, Page-9, S.N.-8	Reducing flue gas pressure across ESP	ESP Inlet Primary & Secondary Gas Distribution Screens Replaced at all 4 passes in Unit - 3 & 4 during AOH.	-
30	NTPS_VOL3, Page-9, S.N.-9	Optimizing the ID fan discharge pressure	Will be checked & be done during AOH of each Unit.	Unit-3 &4 ID fan efficiency improved.
31	NTPS_VOL3, Page-9, S.N.-14	Improving IDF efficiency by overhauling of fan & motors	BM : IDF in each overhaul complete O/H is carried out. EM : ID Fan Motors are overhauled in situ in every AOH/COH.	BM : Reliability is increased EM : Due to Overhauling, healthiness of motor is ensured.
32	VOL2_U3,4 Page-12, S.N.-3	Replacement of ECO coils	Unit-3 Already carried out in July 2009 COH. Unit-4 - replaced in Sept-2010.	Only one BTL in Unit-3 & No BTL in Unit 4 Economiser zone from installation.