FINAL REPORT

(PROJECT CODE- TOS –290)

ON

INSPECTION OF DAMAGED /RUNNING/FAILED PARTS CHPA/B/C of Unit 3 to7

AT

M/s. CHANDRAPUR SUPER THERMAL POWER STATION,MSPGCL,CHANDRAPUR

STUDY CONDUCTED BY:

CENTRAL POWER RESEARCH INSTITUTE
THERMAL RESEARCH CENTRE,DHUTI– 441108,
DIST.-NAGPUR (M.S.)

ACKNOWLEDGEMENT

Work of inspection of damaged /running/failed parts at CHPA/B/C of Unit 3 to7 of CSTPS Chandrapur was carried out by M/s. CPRI, Thermal Research Centre, Dhuti, Nagpur during the month of March-2023 vide email dtd. 03.10.2022.

We express our grateful thanks to Superintending Engineer, Executive Engineer,Addl. Executive Engineerof and Engineers of M/s. CSTPS, MSPGCL, Chandrapur for their valuable co-operation and support extended for successful completion of the test.

We also sincerely thank to Chief Engineer, M/s. Chandrapur STPS, MSPGCL, Chandrapur for their co-operation for the successful completion of the study.

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CONTENTS

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TEST REPORT NO. & DATE	:TRC/EMD/TOS-290/2022-23/FR Date 18.03.2023
CLIENT'S ADDRES	: Chief Engineer, Chandrapur Super Thermal Power Station, Maharashtra State Power Generation Co. Ltd., Chandrapur. (M.S.)
WORK ORDER NO.	: email dtd. 03.03.2023
PARTICULARS OF COMPONENT INSPECTED	: Components CHPA/B/C of Unit 3 to7
PERIOD OF INSPECTION	: 16.03.2023-18.03.2023
PARTICULARS OF INSPECTION	: Inspection of damaged /running/failed parts at CHPA/B/C of Unit 3 to7
TEST IN ACCORDANCE WITH STANDARD/SPECIFICATION/ CLIENTS REQUIRMENT	: As per client's requirement.
DEVIATION IF ANY	: NIL
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NOTE: a) This is not a certificate of compliance.
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(D.M.GOURKHEDE)
JOINT DIRECTOR

1.0 INTRODUCTION

1.1 Detailed Project Report for CHP Improvement Schemes at CHPA/B of Unit 3 to7, CSTPS, Chandrapur is in process. In this context M/s. Chandrapur Suprr Thermal Power Station, MSPGCL, Chandrapur, Maharashtrahave decidedto carry out the work of Inspection of damaged /running/failed parts of CHPA/B of Unit 3 to7 vide email dtd. 03.03.2023.

The Chandrapur Super Thermal Power Station of MAHAGENCO is having installed capacity of 2920 MW. Currently, total 7 Nos. of units are in operation, out of which Units # 3 & 4 are each of generation capacity 210 MW and Units # 5 to 9 are each of generation capacity 500 MW. Unit#3&4 are commissioned in the year -1986. Unit# 5, 6 & 7 are commissioned in the year -1992, 1993 and 1997 respectively. Unit#8&9 are commissioned in the year -2016. The daily requirement of coal is @ 47000 MT for overall CSTPS. To feed the required amount of coal to Unit # 3 to 9, total four Coal Handling Plants CHP-A, CHP-B, CHP-C & CHP-D are installed at CSTPS

The CHPA is commissioning in the year 1984. The Coal Handling Plant-A has to feed the coal to 2x210 MW Units (2x210MW). Daily coal requirement of coal is @ 8000 MT and has facility to receive coal from Rail, Rope & Road mode. Two numbers of Ropeways are installed for transportation of coal from (WCL) Durgapur Open casts mine to CHPA of CSTPS. Daily @ 7000 MT coal being transported through ropeways. Further various interconnection conveyors also installed at CHPA to bunker the coal to Unit 5,6&7 to utilized complete infrastructure of CHPA to feed the coal to CHPB of Unit 5 to7.

The Coal handling Plant-B is commissioned in the year 1992 to feed the coal to 3 x 500MW sets. Daily requirement of coal is @ 24000 MT. Coal received through BOXN & BOBR type wagons are being unloaded at Wagon Tippler hopper & Track hopper with the help of wagon tippler & Paddle feeder respectively. CHP-C is installed to receive coal from Padmapur OCM through CSTPS UTS wagons. The belt conveyor system is established for transportation of unloaded coal from receiving point to coal bunkers of each Unit. Hence to ensure coal at bunkers, smooth running of Coal Handling Plant-A,B,C,D is very much essential, for that healthiness and maximum availability all unloading auxiliary and coal conveyor stream is very important to run the coal handling plant for sustainable capacity.

1.2 The work of Inspection of damaged /running/failed parts of CHPA/B/C of Unit 3 to7, CSTPS, Chandrapur was carried out by CPRI, Thermal Research Centre, Dhuti, Nagpur on 16th to 18thMarch - 2023 at site as per the scope given by the plant authorities.

2.0 PROJECT TEAM

Sr. No.	Name of the official	Dsignation
1.	Sh. D. M. Gourkhede	Joint Director

3.0 OBJECTIVE

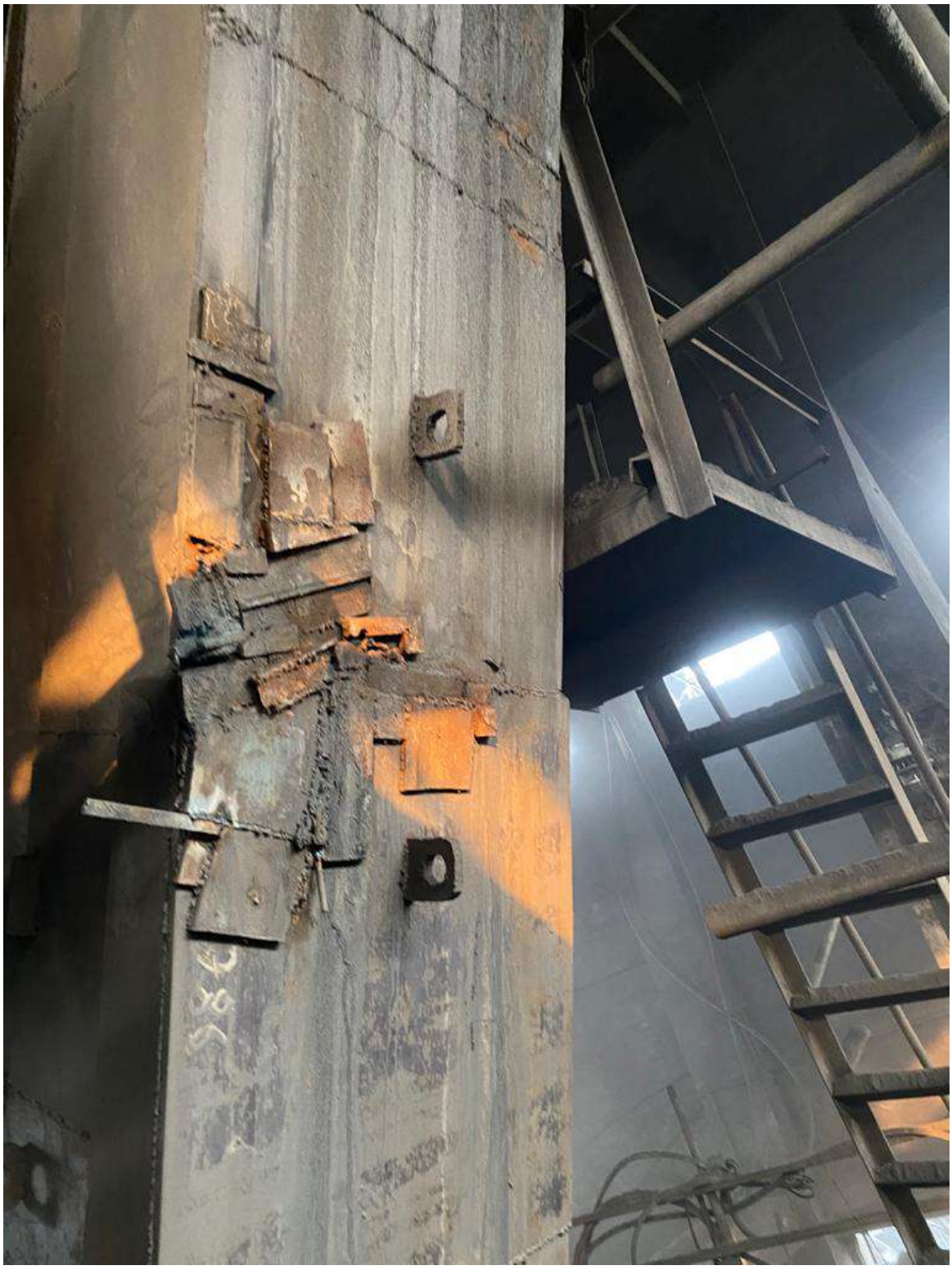
3.1 To carry out the work of Inspection of damaged /running/failed parts of CHPA/B/C of Unit 3to7

3.2 To submit a final report after completion of detailed inspection.

4.0 INSPECTION OF CHP EQUIPMENT AND RECOMMENDATION:

4.1 Crusher House of CHPA of Unit 3&4:

The crusher house of CHPA of Unit 3&4 was inspected. Three nos. of Coal Crushers with vibrating screens are installed for crushing of raw coal received from various coal mines. Other allied auxiliaries are installed at various elevations on complete steel structure of crusher house All installed auxiliaries are in service since commissioning in 1986 and its structure & it's supporting bracing are badly corroded. Many times, repairing/reconditioning & strengthening work done earlier. Vibration level at Crusher House is also noted at higher level. Due to long service i.e., more than 36 years the crusher conveyor structure is subject to rust and wear out mainly due to aging effect and rust prone environment working condition in CHP area.



Recommendation:

Many times, repairing/reconditioning & strengthening work done earlier and now it is beyond repairable. Vibration level at Crusher House is also noted at higher level need urgent modification/modernization/strengthening to avoid secondary failures

In view of observation at crusher house, it is recommended to undertake the suitable concrete major renovation/modification works in installed equipment's in crusher house to enhance the life of Crusher House and for safe & smooth operation of all equipment's to avoid any unforeseen incidence in future.

4.2 Belt Conveyor 10A/B/C of CHPA of Unit 3&4

Belt Conveyors BC- 10A/B/C are the critical conveyors, any failure or breakdown may lead to generation loss. These conveyors are located near to coal reject yard having high sulfur fumes due to whichbelt conveyor steel structures are subjected to heavy rate of rusting. As per visual survey, it is observed that conveyor steel structures are badly rusted at several locations.Conveyors trusses supporting conveyor belt floor are apparently highly corroded and top member of N trusses are showing extensive deterioration. After rendering the more than 36 years of service, sign of deterioration were observed in the form of collapsing walkway, increased deflection of N trusses between towers due to extraordinary loads of electric cables they are made to support, extraordinary corrosion of cross member supports, broken cross bracing and structural member of tower supporting conveyor belts. The vertical gantry supports & bracing are damaged or dislocated at many places. This led to the misalignment of the deck channel structure which further led to the running out problem of conveyor belts 10A/B/C.

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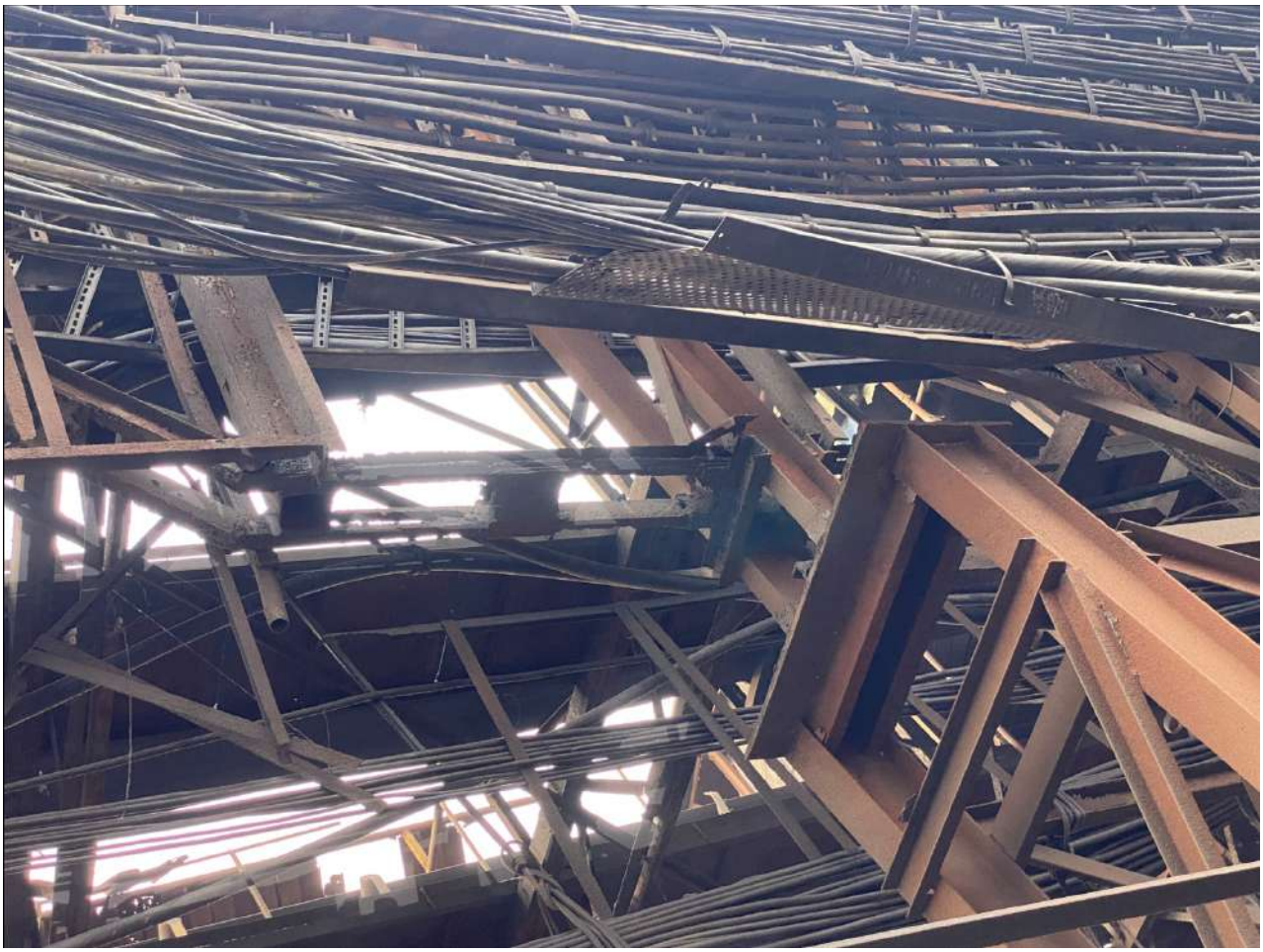
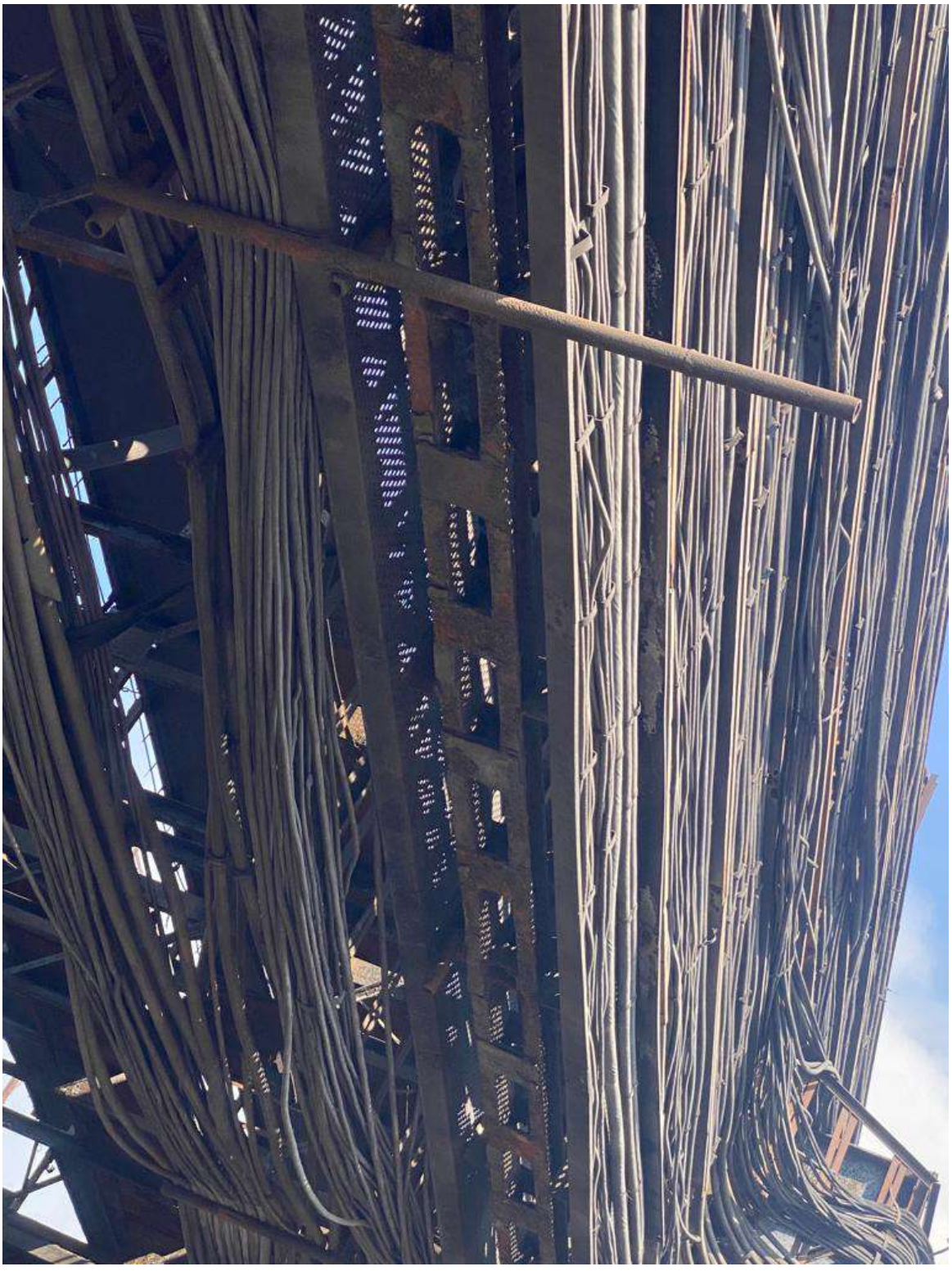
Recommendation:

In past strengthening or repairing of the above conveyors structure has been done, but now it is beyond repairable and its post dislocated from concrete foundation. Hence it is recommended to take up the work of Renovation/Upgradation/Modification of Belt Conveyor 10A/B/C with allied works on urgent basis in CHPA, so that bunkering conveyor stream BC 10A/B/C will run sustainable capacity.

4.3 Conveyor cable of 10 A/B/C of CHPA of Unit 3&4:

At present conveyor cable are installed along both side of conveyor gantry structure which increases the load on conveyor gantries. Further, in past major breakdown was occurred at belt conveyor 10A/B/C in which conveyor gantry structure was buckled at some locations. On thorough inspection it is due to the long service of more than 36 years & aging effect and all overweighed conveyor cable, the conveyor gantry is under danger zone





Recommendation:

Considering importance of BC 10A/B/C as main bunkering streams and comes under generation path &safety point of view it is recommended for Modification/Modernization of conveyor cable of 10 A/B/C of CHPA in which unwanted excess cables (Unit 1&2 are decommissioned) may be

removed permanently and running existing cable may installed on separate New structure for smooth generation of Unit 3&4 sets.

4.4 Bypass chute with hydraulic cylinder at JT-08 of CHPA of Unit 3&4:

JT-08 (Junction Tower) is installed where reclaiming conveyor streams BC 23A/B/C are provided to receive coal from Elecon stacker through BC 22B and DRCC reclaiming through BC 21B.Various multiple chutes & flap gates are installed at JT-08 through which coal from BC 21B & BC 22B transported to bunkering streams.However, there is some limitation like BC 21B (DRCC conveyor) delivered coal only on BC 23A or BC 23B not in BC 23C and BC 22B (Elecon conveyor) delivered coal only on BC 23B or BC 23C not in BC 23A. Due to these limitations, generation loss occurred for unit 3&4. Further BC 119 is installed at JT-08 as a priority conveyor to transport the coal from Elecon reclaiming conveyor through BC 22B to Unit 5,6&7. Hence JT-08 play very vital role to maintained the bunker level of Unit 3&4. Due to long service life i.e., more than 36 years & aging effect, existing JT-06 structures are rusted at many location and concrete structures also dislocated.The repairing / refurbishment / strengthening also done in past.At present, coal stacked at Elecon stack yard is being utilized for CHPB by feeding the coal to bunkers of Unit 5,6&7 via BC 119 in JT-08. In case, there is shortage of coal at CHPB stack yard or there is problem of Stacker Reclaimer for reclaiming purpose and no coal rakes for unloading to bunkered, then there may be generation loss to Unit5,6&7 on account of poor coal bunkering. Further, coal stacked at DRCC stack yard is needs to be feed from BC 21B to BC 119. So, feasibility is checked to interconnect stack pile of DRCC of CHPA to CHPB so that there will be additional alternatives to feed the coal to Unit 5,6&7 bunkers of CHPB. This will help for reduction in demurrage charges by unloading N-box wagon at CHPA wagon tippler on regular basis, to maintain the bunker level of Unit5,6&7. Accordingly, bypass chute arrangement & hydraulic actuator system may be installed at DRCC discharge chute of BC 21B to utilized coal for Unit 5,6&7

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Recommendation:

In view of above, to utilize the infrastructure of CHPA to its full extent, to use the excess coal stacked in CHPA, for better performance of Coal handling plant in terms to avoid generation loss and reduction in rake detention time it is recommended for Design, Engineering, Supply, Erection and commissioning of bypass chute with hydraulic cylinder & modification/renovation at JT-08

for smooth running of coal handling plant for smooth generation of Unit 3 to 7 and fast unloading of wagons at CSTPS Chandrapur.

4.5 Wear Resistance Chutes for Belt Conveyor System at CHPA/B of Unit 3to9:

The various conveyor discharge/receiving chute & other auxiliaries skirt board is under unloading zone are subjected to heavy impact and abrasion due to transportation of ROM coal received from various coal mines.It is observed that back/side plates of receiving/discharge chutes are worn out.On the inspection of chutes of CHPA & CHPB, it is observed some conveyor chutes are worn out heavily and resulted into frequent coal leakages. Repeated patching works were carried out on the chutes as per history records.

Recommendation:

Due to repeated patching & other work, these chutes are beyond repairable and need replacement on urgent basis to avoid secondary damages to costly conveyor system and to avoid hampering the unloading of 'N' box wagons.Hence to avoid coal spillage and to ensure smooth operation of coal handling plant, timely replacement of these chutes plates with suitable wear plates of sufficient hardness & suitable material composition is required as per wear pattern & coal flow trajectory.

In view of above and to ensure higher availability of unloading system for smooth running of coal handling plant, it is proposed for Design, Engineering, Supply, Erection and Installation of Wear Resistance Chutes for Belt Conveyor System at CHPA/B of Unit 3to9 of CSTPS Chandrapur.

4.6 Ventilation System of Track Hopper of CHPB of Unit 5,6&7

On preliminary inspection the existing ventilation system at Track hopper tunnel is not sufficient to supply the fresh air as per MPCB norms. Ventilation system is badly damaged and it is beyond repairable.

Recommendation:

In order to ensure the sufficient air in each elevation, provision of new ventilation system is recommended by renovation of existing ventilation system as per requirement. Further Environmental Pollution Control norms have been made more stringent and are observed very strictly which enforces to take all necessary renovation upgradation which control fugitive emission within prescribed limits of MPCB. Hence, it is very much essential to install New Ventilation system to avoid human health hazard.

To achieve healthy working environment condition and also to maintain the ambient air temperature & sufficient fresh air at Track Hopper Tunnel in all the season, it is recommended for Work of Modification/Renovation/Upgradation of Ventilation System of Track Hopper of CHPB of Unit 5,6&7 of CSTPS Chandrapur

4.7 Work of Renovation /Upgradation of Hydraulic System of Paddle Feeder at CHPB of Unit 5,6&7

Smooth running of Paddle Feeder plays very vital role in unloading of BOBR wagons within a given time and also play important role in bunkering. Failure of this system may hamper complete unloading result in poor unloading and penalizing of demurrage charges. Paddle Feeder is at CHPB in the year 1992 and hydraulic system of Paddle Feeder is design & supply in 1989-90. Hence maximum availability of this system healthiness of this equipment's is very essential. Since the Paddle Feeder is in service since last 35 years the mechanical maintenance of this paddle feeder and aging effect as per the history records. OEM has declared that existing hydraulic pumps, valves are obsolete and suggested to change the hydraulic system for up gradation so that it will work for next 15-20 years and the required hydraulic spares may be easily available in the market. Control panel of existing paddle feeder is of old version and the Electronic Amplifier Card obsolete & is not available in market. Hence it was repaired by local party to cater to the present need but the service life is of short duration and frequent repairing is needed which eventually hamper the Paddle Feeder operation. All interlocks are also not in service which is of great concern as far as safety point of view.

Recommendation:

In view of the above it is recommended to renovate the three nos. of Paddle Feeder by replacing hydraulic system with upgraded version so that after renovation it may work for next 15-20 years with assurance of availability of spares.

4.8 Design, Engineering, Manufacturing, Fabrication, Erection and commissioning of Modified Wobbler Feeder at CHPB of Unit 5,6&7

Four nos. Wobbler Feeders are installed & commissioned in the year 1992 for raw coal at a controlled rate and scalping fines from theraw coal received from various coal mines and in service since commissioning. Due to continuous operation of wobbler feeders since commissioning, most of the spares viz wobblers feeder head & tail bar , wobblers bar – intermediate, wobblers bar –intermediate, triplex roller chain 2" pitch x 177 links + 1 master link triplex roller chain 2" pitch x 177 links + 1 master link, simplex cahin simplex cahin, hold down bar hold down bar, drive chain sprocket, UCX-20 Bearing & Housing UCX-20 Bearing & Housing of Wobblers Feeders are worn out results into misalignment and subsequently disturbance of timing of Wobbler bars results into outage of Wobbler Feeders. Also receiving &discharge chutes of Wobbler Feeder is

also damaged badly. Patches welded at various places in the past.The main girder of wobble feeder on which wobbler bars are positioned through UCX20 bearing & housing is also rusted & worn out which resulting frequent looseness in bearing housing bolts. Consequently the non-availability of Wobbler Feeder and its consequential effects on unloading and transporting of coal, may causes to levy more demurrage charges, also a generation loss due to poor bunkering. Hence maximum availability of this system and healthiness of this equipment's is very essential.

Recommendation**:**

In view of above and for better performance of Wobbler Feeders of Coal handling plant B in terms to reduce unavailability of unloading stream and to reduce demurrage charges, it is recommended to replace the 03 nos wobbler Feeder with modified wobbler Feeder of CHPB of Unit 5,6&7 in CSTPS Chandrapur.

4.9 Crusher House & Track Hopper Unloading System of CHPC of Unit-6&7.

Installed crushers & wobbler feeders of CHPC are in service commissioning (i.e., 1997) and failures/breakdown of crushing elements or screening elements are increased due to long service life. As per history register many times repeated work carried out to attend the breakdown and put in service, but getting very less service life. Hence it is very much essential to upgrade/renovate the existing elements of crusher & wobblers to give sustainable life and able to handle coal more than 9000 MT coal per day.

To avoid ingress of dust from crusher house during crushing & transportation of coal, crusher house structure is covered with corrugated GI sheet.Healthiness and availability of sufficient corrugated GI sheet is essential to ensure proper enclose of Crusher House and it is statutory requirement for dust emission control.During inspection most of the corrugated GI sheet are damaged which needs to replace with new upgraded size and type of sheet for longer service life with proper enclosure of crusher house. Also it is observed that CHPC Crusher House is very

nearer to public school and due to noise produce by crusher house it creates noise pollution and affects them. Further it is observed that mechanical lift provided is condemned.

Recommendation:

Considering long service life with other aging effect and Critical Auxiliary as comes under generation path it is very much essential to taken up the work of Work of

Upgradation/Renovation of Crusher House & Track Hopper Unloading System of CHPC for smooth running of coal handling plant that includes smooth unloading of wagons, smooth bunkering & safety and other statutory norms so that all auxiliary in Crusher House will run sustainable capacity for next 15-20 years and to run the all the Units of 500MW as per KRA target. For abatement of noise, it is recommended to suitable sound barrier along the length of public school. For mechanical lift it is recommended to remove it for safety of human being.

4.10 LED based energy efficient illumination system at CHPA,B&C.

Conventional lighting systems installed at various locations of CHP- A, B & C consist of high intensity discharge (HID) lamps such as metal halide or high-pressure sodium lamps. In conventional lamps like incandescent and gas discharge lamps, most of the electricity is wasted in terms of heat and also since ballast requires high voltage at the time of starting, these consume more power, making them extremely energy inefficient. These conventional lighting systems are installed since commissioning of respective coal handling plants, and in due course of time, many fixtures, wiring, junction boxes, conduits etc. are damaged and corroded because of excessive coal dust prevalent in CHP area. Therefore, frequent occurrences of short circuits and flashovers in old lighting circuits are common and are hazardous to safety of operation and maintenance personnel thereby affecting the quality of lighting system. Conventional lighting consumes far more energy producing a lot of heat as well, and the hot equipment can be difficult to handle and manage. Also due to significantly shorter life, conventional fixtures have to be replaced and repurchased often. This directly increases the cost of maintaining the lighting system with increased inventory requirement and manpower management. Also due to various onsite modifications and addition of auxiliaries over the years, the existing lighting system has become insufficient to maintain the required illumination level. There has been an unbalanced phase distribution of lighting circuits is also one of the major issues of concern. The lighting design also strongly affects visual performance and visual comfort by aiming to maintain adequate and appropriate illumination while controlling reflection and glare.

Recommendation:

By installing advanced lighting technologies, reduction in the amount of electricity consumed and energy costs associated with lighting can be achieved. Energy efficient lighting reduces the electricity demand and is a cost-effective method of lighting system compared to conventional lighting methods. Energy efficient lighting includes the use of more illumination from less power lights by replacing high power consumption lights like incandescent, high discharge lamps, etc. It will also replace high power lighting accessories by low power devices such as electronic ballasts, fixtures, etc.

In view of above, it is recommended for Design, supply, installation & commissioning of LED based energy efficient illumination system at CHP-A, B & C.

4.11 Conveyor deck module for underground belt conveyor streams of CHPB of Unit 5 to 7

Belt Conveyor 102A/B/C and BC 105A/B are partial underground conveyor belt of CHPB and play very key role in unloading of coal and bunkering of coal. On thorough inspection of the deck module of underground conveyor installed in CHPB, it is found that the deck channels and supports are badly corroded. The vertical supports are damaged or dislocated at many places. This

led to the misalignment of the deck channel structure which further led to the running out problem of conveyor belts. Due to spillage of coal & corrosive property of coal, most of the deck plates are badly rusted, dislocated and tend to touch the conveyor belt on return side. In past strengthening or repairing of these damaged stinger channel /angle post has been done.

Recommendation:

The rusted deck module needs immediate complete replacement with providing proper angle support underneath and painting with anticorrosive paint. In past strengthening or repairing of these damaged stinger channel /angle post has been done, but now it is beyond repairable and its angle post dislocated from concrete foundation.

Hence it is very much essential and recommended to taken up the work of Renovation & upgradation of conveyor deck module for underground belt conveyor streams of CHPB by replacement of conveyor deck module with allied works on urgent basis in CHPB.

4.12 Transfer Point of CHPB of Unit 5 to 7

Various Transfer Points (like TP104/TP105/TP106/TP 110/11) are installed at CHPB to transfer the coal from one conveyor to another conveyor by longitudinal or transverse transfer. Healthiness, reliability and safe working operation activities at Transfer Points is very much essential for smooth transportation of coal from unloading end to bunkers of all units. These transfer points are in service since commissioning. Due to rusting & abrasion property of coal, transfer points structure has leads to heavy vibration. As per history register in past such type of vibrations are noticed and attended locally at Transfer Point 104.

The dust emission is occurred in Transfer Point during transportation of coal. Transfer Pont structure is covered with corrugated GI sheet to avoid dust ingress in atmosphere. Healthiness and availability of sufficient corrugated GI sheet is essential to ensure proper enclose of Transfer

Point and it is statutory requirement for dust emission control. In past some damaged corrugated sheets are replaced with new.

Further it is observed that mechanical lift provided at TP 104 is condemned.

Recommendation:

To address above, Transfer point vibrations analysis along with structural audit will be required and necessary modification & modernization of Transfer Pontstructure is recommended. The dust emission is occurred in Transfer Point during transportation of coal.Transfer Pontstructure is to be covered with new upgraded size and type of sheet for longer service life with proper enclosure to avoid dust ingress in atmosphere.

In view of the above, the Design, engineering, providing & installation of ventilation system as per area of transfer point for fresh air as per statutory norms is recommended. For mechanical lift it is recommended to remove it for safety of human being.

4.13 Walkway pathway of CHPB of Unit 5 to 7

Coal Handling Plant –B of Unit 5,6&7 is commissioned in the year 1992-93 and handling @ 60-70 lakhs MT coal per year. The length of 22 Km conveyor belts is installed in CHPB for transportation of coal from unloading end to bunkers of each unit. To ensure coal at bunkers, smooth running of conveyor belt system is very much essential. Walkway platform are provided on both sides of belt conveyor system for walking, inspection and maintenance of conveyor belt system. The concrete walkway platform is provided at both side of conveyor belt system at elevated height. Healthy and good condition of walkway is necessary for safe and smooth maintenance of conveyor belt system and also safe movement of human being. Due to long service of concrete walkways & accumulation of coal on walkways, dislocating of concrete metals are observed. Hence, in past repairing/replacement/strengthening of damaged walkways platform was done to avoid fatal incidence. However, quantum of concrete walkways is much more, hence till date repeated works carried on walkway way platform for repairing/strengthening, but till date some walkway platforms are not safe. Fatal incidence may happen in CHP due to unsafe condition of walkways platform. At present walkways platform of BC 103A/B, BC 108A/B & BC 109A/B are badly damaged and due to repeated patching/repairing/partial replacement of walkways, it needs modernization of walkways with renovation & upgradation so that it will get sustainable life and ensure healthy working environment.

Recommendation:

In view of above, to ensure safety of manpower for healthy working environment, it is recommended for modernization of existing old concrete walkways platform with new upgraded steel platform considering additional features like additional supporting cross bracing, new toe guard, provision of supporting vertical seal plates at receiving ends, main supporting structure replacement, etc.

4.14 Bunker Shuttle Conveyor of CHPB of Unit 5 to 7

At CHPB, Belt Conveyor 112A/B, 113A/B and 115A/B are the shuttle conveyor exclusively to the feed coal to bunkers of Unit 5,6&7 respectively. These Shuttle Conveyors are playing very vital role to maintain the bunker levels for smooth generation of electricity (500MWx3). Shuttle conveyor moveable & reversible conveyor and travelled on rail track system provided below shuttle conveyor. The shuttle conveyor deck module consists of horizontal stringer channel with supporting steel angle bracing, conveyor frames, idlers, deck sheets, drive units, etc. These shuttle conveyors are in service commissioning i.e., 1992, 1993 & 1997. On thorough inspection of the deck module of shuttle conveyor, it is found that the deck channels and supporting bracing steel are badly corroded. This led to the misalignment of the shuttle conveyor which further led to the

running out problem of conveyor belts and coal spillage. Further rail track system also worn severely. Slipping problem also notice frequently as per records. In past repairing/replacement/strengthening of deck module/take up system/rail track system was done but problems still persist. Further it is noticed that bunker grills are made of mild steel material which are prone to erosion results in less life.

Recommendation:

Considering long service life minimum 15 years, shuttle conveyor needs to be renovated and modernized for smooth running of coal handling plant for smooth generation by complete replacement of travel rail track system with modified system, modification of deck module by reducing load on shuttle gross weight, replacement of deck sheets, modified take up tensioning arrangement etc.

Hence considering smooth generation of electricity as per KRA target and to ensure the system runs to the maximum capacity for next minimum 15 years and to run the all the Units of 500MW as per KRA target., it is very much essential to taken up the work of Renovation & upgradation of Bunker Shuttle Conveyor with allied works on urgent basis in CHPB. For improving the life of bunker grills it is recommended to provide suitable layer of wear resistant material at top only.

4.15 Wagon Locking System for Wagon Tippler and Portable Reclaim Feeder of CHP of Unit 5 to 9

As already mentioned, to feed the required amount of coal to Unit # 3 to 9, total four Coal Handling Plants CHP-A, CHP-B, CHP-C & CHP-D are installed at CSTPS since commissioning of respective units. Hence total 05 nos. of Wagon Tippler are installed in CHPB & CHPD for unloading of NBOX wagons and having pulling capacity of 20 nos. wagons & 30 nos. wagons respectively. Nearly 80% coal received through rail mode out of which 60% rake received through N rakes. Hence healthiness and availability of Wagon Tipplers are very much essential for smooth unloading of NBOX wagons for smooth generation of electricity. At present received N rakes are distributed & unloaded at CHPB&CHPD and in case of bunching rakes wagons distributed at CHPA wagon tippler. The distributed wagons in the bunch of 20-30 wagons placed at inhaul rail track side of wagon tippler and after brake release wagon unloading starts with the help of Side Arm Charger. After wagon unloading empty wagons forwarded to outhaul track. To avoid rolling of loaded/empty wagons towards tippler side or backward direction, holding of wagon is very much essential for safety of Wagon Tippler and safety of manpower working at site. In past rolling problem & wagon derailed problem noticed due to non-holding of wagon wheel.

Further it is noted that CSTPS handling more than 115 Lakh MT coal per year and having generation capacity is also high i.e., 2920 MW. If some problem occurred in the Stacker it will affect the generation.

Recommendation:

Hence for safe and reliable wagon tippler operation hydraulically operated wagon wheel locking system is need to be provided for secure locking of loaded as well as empty wagons during tippler operation to avoid fatal accidents. It is submitted that perfect wagon wheel clamping system is the top most essential for safety & operational requirement for the wagon tippler system.

Considering the above silent features & maintenance benefits & to enhance the safety of wagon tippler, it is recommended to install the Wagon Locking System for all 05 nos. Wagon Tippler at inhaul side.

To avoid the generation loss due to unavailability of stacker, it is recommended to have portable reclaimed feeder which is an efficient and cost effective mechanism for reclaiming stock coal piles and coal feeding.

4.16 Dust Extraction System for Crusher House of CHP of Unit 3 to 7 and Energy Efficient Air-Cooling System for CHP of Unit 5,6&7

During operation activities of Coal Handling Plant considerable coal dust is generated at Crusher House. To control the emission of dust particle, the Dust Extraction system was provided during commissioning of coal handling plant. Since it is @ 25-30 years old system, it is not in service and unable to handle existing dust load at crusher house & bunker house. The existing dust suppression system is not sufficient to combat dust emission as per standard set by MPCB. Further, Environmental Pollution Control norms have been made more stringent and are observed very strictly which enforces to install new Dust Extraction system which control fugitive emission within prescribed limits of MPCB. As per records MPCB have served the show-cause notice for legal action to be taken against CSTPS under provision of Water (Prevention & Control of Pollution) Act, 1974 & Air (Prevention & Control of Pollution) Act, 1984.

Further Air-cooling system also known as ventilation system is provided at Wagon Tippler MCC room, Switchgear rooms in SS I & SS II & CHPC MCC room is badly damaged.These are beyond repairable need to be replaced with new energy efficient air temperature air cooling system with upgraded version. Available air-cooling system installed in CHPB/C are in service since commissioning and in past many times repairing,retrofitting, strengthening done but air-cooling system is not sufficient to maintain the conditioning temperature of MCC/Relay rooms.

Recommendation:

It is recommended to install New Dust Extraction System to avoid human health hazard and penal action from MPCB.

Also, it is recommended for design, engineering and supply of new up graded version new energy efficient air temperature air cooling system.

5.0 Conclusion:

Inspected equipment are badly damage & are beyond repair. Replacement seems to be the only solution to further improve the coal handling plant availability & performance as CEA has circulated the necessary guidelines & advised that all power utilities not to retire any thermal units till 2030 and ensure the availability of units after carrying out the necessary renovation and modernization of aged coal fired thermal power plant for life extension and improve the reliability of thermal units considering the expected demand scenario in future.

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