

**IMPLEMENTATION OF PRIMAVERA AT MASTER POWER PRIVATE LIMITED**

**For**

**1x20MW Coal Fired Power Plant**

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**ENROLLMENT:** 03-298161-043

**SEMESTER:** Spring-2017, MSPM - III    **PROGRAM:** MSPM

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**BAHRIA UNIVERSITY LAHORE CAMPUS**

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**SUBMITTED TO:** Mr. Muhammad Faisal Shahzad

**SUBMISSION DATE:** 11-Jun-2017

## MASTER POWER (PRIVATE) LIMITED

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Friday, June 09, 2017

### CERTIFICATE

This witness statement is issued to the applicant for the fulfilment of their MS (Project Management) program requirements being carried out at Bahria University Lahore Campus (BULC).

It is witnessed that **Mr. Shahzad Ahmed & Mr. Siddique Ata** Enrollment: **03-298161-06 & 03-298161-018** respectively. Class: **MSPM-III** Semester: **SPRING 2017** have contacted / visited frequently utilized our premises / participated in our real-time projects for implementing project management skills using EPM as a leading software tool.

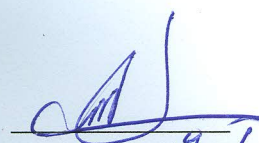
They, in case of participation in organization's project, have contributed fully in the following project and within the highlighted fields (planning, scheduling, earned value analysis, performance monitoring):

**Project Name: 1x20MW Coal Fired Power Plant**

They, in case of visiting/ frequently utilized premises, have been found skillful in applying EPM in the following highlighted fields (planning, scheduling, earned value analysis, performance monitoring, and report generation).

Additionally, it is noteworthy to mention that Mr. Shahzad Ahmed & Mr. Siddique Ata demonstrated good ethical practices, enthusiastic approach to work, task convergence capabilities, professionalism while their stay / connection with this organization.

Certified By Company Official:

  
9-6-2017

Name:

Engr. Muhammad Noman

Designation:

Project Engineer

Contact# 0320-7700226,

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### **Abstract**

The purpose of this study is to implement Primavera P-6 software along with PMI project management approach to the project. Selected project 20MW Coal fired power plant procurement, erection, installation and commissioning phases have a lot of activities and these all activities are dependent to each other. So it is very easy to manage such kind of projects by using Primavera P-6.

Selected company has some other projects running under their domain. The purpose of study is to manage company portfolio by using Primavera P-6 software to manage complex projects.



### **Acknowledgement**

We would like to thank Almighty for giving us the strength to complete this project report on time. We are really thankful to our respected instructor for guiding us in the right direction, we are thankful to our colleagues and university staff who helped us when we were feeling difficulty in implementation of primavera. Last but not least we are thankful to our parents for believing in us and supporting us in every step forward. We are especially thankful to following

|                    |                                          |
|--------------------|------------------------------------------|
| MR. Faisal Shahzad | Primavera Instructor (Bahria University) |
| Mr. Muhammad Noman | Project Engineer (MPPL)                  |
| Mr. Imran Khan     | Project Manager (MPPL)                   |



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## 1 INTRODUCTION TO PROJECT MANAGEMENT

At its core, project management is simply the planning, organizing and managing of tasks and resources to accomplish a defined objective, usually with constraints on time and cost. Most projects, whether they are large and complex or small and simple, can be planned by breaking the project into small, easily manageable tasks, scheduling the tasks, and then tracking the tasks as work progresses.

Project management helps you answer questions such as:

- ♦ What is to be done?
- ♦ Who will complete the task?
- ♦ When must it be done?
- ♦ How much will it cost?
- ♦ What happens if work isn't completed on time?

Typically, project management involves **three** major activities:

### 1.1 Planning the project and creating a schedule

This includes defining the tasks and their duration, setting up relationships between tasks, and, if you are tracking resource usage, assigning resources. ALL later phases of the project are based directly on the information you provide when you first plan your project.

### 1.2 Managing changes

This is an ongoing process that begins once you create a schedule and the project starts, and ends when the project is complete. It includes tracking and adjusting your schedule to reflect changes that occur as the project progresses.

### 1.3 Communicating project information

This is a very important process that involves communicating project information to clients, project staff, and management.

Project management software is productivity software that will assist you in each of these steps. Many professionals find it is among the most productive tools in



their skill set. Some Information Systems professionals will find it essential to their jobs while many others will use it only on an occasional basis.

2 What is a Primavera P-6?

Primavera is an enterprise project portfolio management software. It includes project management, product management, collaboration and control capabilities, and integrates with other enterprise software such as Oracle and SAP's ERP systems

3 Benefits of Primavera Use:

- 1. Primavera P-6 Reduces Risk
- 2. Easy to use software
- 3. Portfolio Management Software
- 4. Optimized Resources
- 5. Enhanced Visibility
- 6. Forecasting of Project Activities
- 7. Tracking Features
- 8. Enhanced Communications
- 9. Improved Collaboration
- 10. Give employees responsibility in schedule creation

4 Microsoft Project vs. Primavera P-6

| Microsoft Power                                                            | Primavera P-6                                                    |
|----------------------------------------------------------------------------|------------------------------------------------------------------|
| Simple & User Friendly                                                     | Detailed & Complex                                               |
| Does not allow multiple user to work on a single project at the same time. | It allows multiple users to work on single project.              |
| Limited Baseline only 11                                                   | Unlimited Baseline                                               |
| Project Tracking with multiple projects at same time is not possible       | Project Tracking with multiple projects at same time is possible |
| Issue or Risk cannot be tracked                                            | Issue and Risk can be recorded against project                   |

|                                                     |                                                                                |
|-----------------------------------------------------|--------------------------------------------------------------------------------|
| Multiple activity relationship not possible         | It is possible to have a FF as well as SS relationship between two activities. |
| Relatively low cost of installation and maintenance | High installation and maintenance cost.                                        |

Table 1 MS Project vs. Primavera P-6

5 What is Earned Value Management (EVM)?

- A method of integrating scope, schedule, and resources, and for measuring project performance.
- It compares the amount of work that was planned with what was actually earned with what was actually spent to determine if cost and schedule performance are as planned.

5.1 What is needed for EVM?

- A baseline plan
- A project budget (BAC – Budget at Completion)
- A project end date
- Tasks are identified & scheduled
- Each task has a budget or effort (resource loaded / weighting)
- Actuals tracked

5.2 To perform EVM, three values need to be determined

- Planned Value (PV or BCWS)
- Actual Costs (AC or ACWP)
- Earned Value (EV or BCWP)

Planned Value (PV)

What are the budgeted costs of the work scheduled?

- Time phased based on baseline budget



- Only changes when baseline is changed
- Also referred as “BCWS” & “BAC”

### 5.3 Actual Cost (AC)

What are the actual costs of the work performed?

- Based on the actual completion of work packages
- Actual costs for reported work
- Also referred as “ACWP”

### 5.4 Earned Value (EV)

What are the budgeted costs of the work performed?

- Based on the actual completion of work packages
- Baseline value of the reported work
- Also referred as “BCWP”

## 6 Calculating Earned Value and interpreting results

- to measure the progress of the project
- help identify trends
- forecast costs
- And identify ways to correct/mitigate project pitfalls.

### 6.1 Cost Variance (CV)

$$CV = EV - AC$$

- Good News: If CV value is positive, the project is currently under budget (spending less than planned for the work)
- Bad News: If CV value is negative, the project is currently over budget (spending more than planned for the work)

### 6.2 Cost Performance Index (CPI)

$$CPI = EV / AC$$



- Good News: If CPI value is  $>1$  or  $=1$ , the project cost trend is currently under or at planned budget
- Bad News: If CPI value  $<1$ , the project cost trend is currently over budget

Cost Variance % (CV %)

$$CV\% = CV / EV$$

- Good News: If CV% value is positive, the project is currently under budget by the CV%
- Bad News: If CV% value is negative, the project is currently over budget by the CV%

Schedule Variance % (SV %)

- $SV\% = SV / PV$
- Good News: If SV value is positive, the project is currently ahead of schedule
- Bad News: If SV value is negative, the project is currently behind schedule

### 6.3 Estimate at Completion (EAC) #1

Actual costs to date plus a new estimate for all remaining work (original plan no longer valid)

$$EAC = AC + ETC \quad \text{Estimate at Completion (EAC) \#2}$$

Actual costs to date plus remaining budget (current variances are viewed as atypical of future variances)

$$EAC = AC + BAC - EV$$

Chapter#02

1 Master Group of Industries:

Introduction:

Master Group is one of the most dynamic and diverse business groups of Pakistan. The Group started its operations by entering the bedding industry in 1963 as a licensee of Bayer A.G. (Germany) to manufacture foam mattresses in Pakistan and became a pioneer in the market. Today, Master Moltyfoam has become a household name, synonymous with the highest quality products in the Pakistani market. The Group controls a large asset base of over PKR 20 billion and has an annual turnover of over PKR 25 billion. Master Group is not only the leading player in the bedding market, but has also diversified over the period into the textile, automobile, engineering and energy sectors.

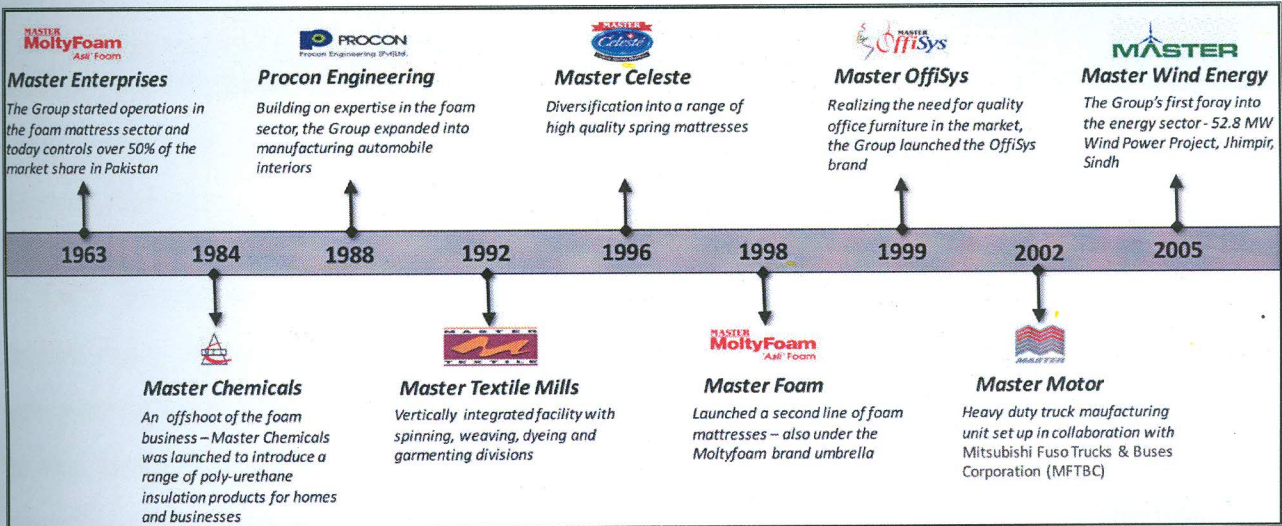


Figure 1Master Group History

Master Molty Foam:

Since 1963, Master has been the most trusted name in bedding, furniture and healthcare industry providing products of unmatched quality with guaranteed customer satisfaction. Innovating from a technical collaboration with Bayer (Germany), Master Moltyfoam evolved as a generic name for foam.

Our vision has always been focused at keeping a smile on our customers' faces. This is the driving force that keeps us introducing new products. State of the art



technology, finest craftsmanship, strict quality controls, and continuous consumer interactions ensure that we achieve the highest level of perfection in our products.

Our research departments and technical testing laboratories confirm Master's high standards of excellence; and working constantly to innovate and formulate new and better foam applications designed for your comfort.



Figure 2 Master Celeste

### Master Celeste:

In 1997, Master introduced the American brand, Celeste that has today become the bench mark of luxurious sleep system in Pakistan. We are committed to providing you with a luxury lifestyle that is supported with the Ultimate Sleep System perfected to the last detail. Wake up every morning feeling refreshed and rejuvenated. Our promise to you is a healthy life. Celeste Home Fashion is a premium retail lifestyle brand offering a wide range of ready-made signature bedrooms in styles ranging from classic, to modern, edgy, or minimalist to perfectly suit our customers' style needs.

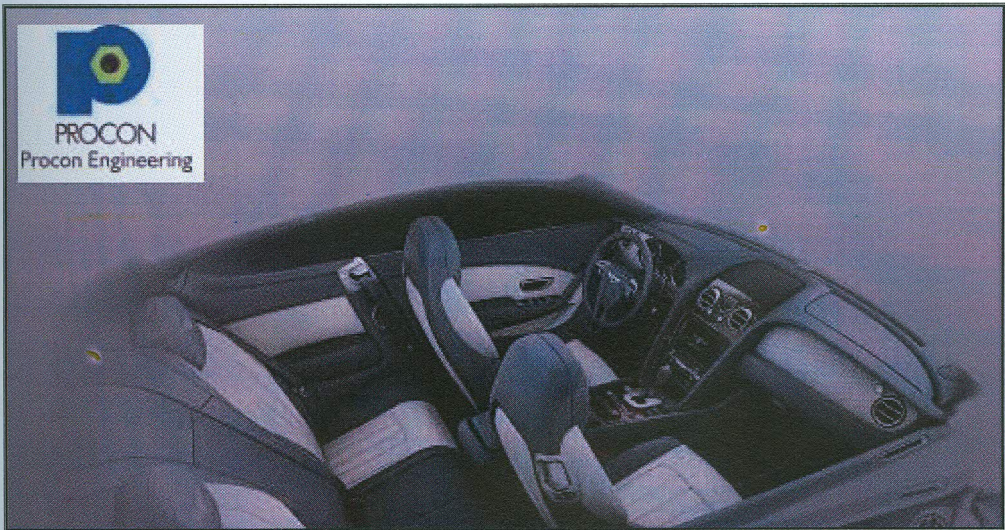




Figure 3 Master Celeste

**Master Procon Engineering:**

Procon Engineering works started in 1998, Procon has proved its courage as the leading car interior and other component manufacturer of Pakistan. Procon supplies high quality finished products and interiors to leading car, bus, and motorcycle and truck manufacturer.





**Master Chemicals:**

Master Chemicals Ltd is a company that has put up great efforts and ventured into conserving energy with an intention of making its contribution to the nation's economic growth. It also introduced Master Thermo shield, a product that could assist in saving substantial electricity and contribute towards a more energy efficient Pakistan.



Figure 4 Master Chemicals



**Master Textile Mills:**

Since 1993, Master textiles have been one of the leading Textile Manufacturers of Pakistan. Equipped with state of the art spinning, weaving and garments facility, Master Textiles is dedicated to producing according to European and American standards



Figure 5 Master Textiles



**Master Motor Corporation:**

Master Motor Corporation Limited (MMCL) is an ISO certified automobile assembling; manufacturing company. It is an authorized assembler/ manufacturer in Pakistan for leading Commercial Vehicles from Japan & China. MMCL has a strong commercial base in both Public and Private sector organizations.



Figure 6 Master Motors

**Offisys by Master:**

Master Offisys excels in the field of manufacturing a diverse range of innovative, trendy and comfortable office furniture. Since its inception it has set a new benchmark in the world of corporate furnishing.

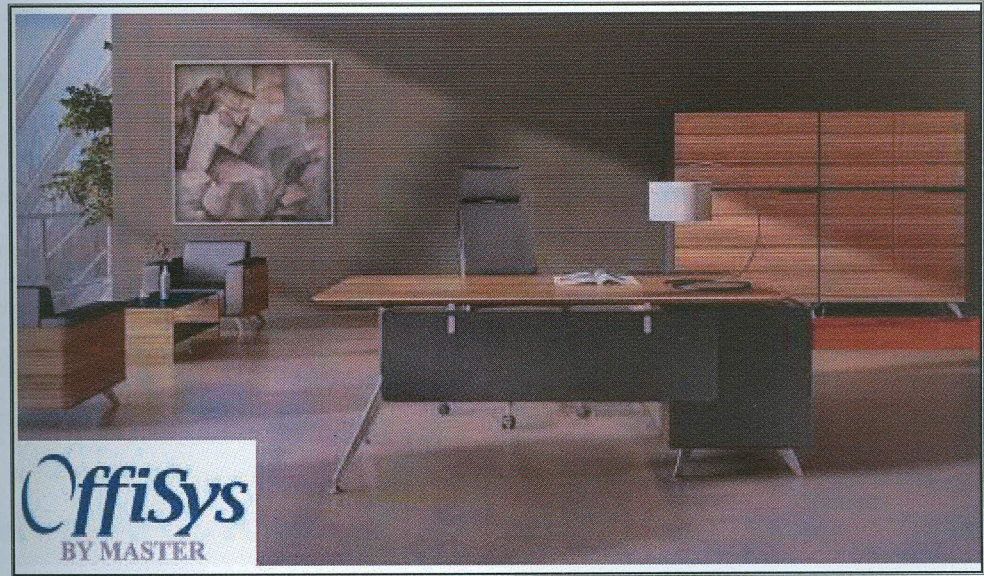


Figure 7 Master Offisys



**Master Wind Energy:**

At Master Wind, We are committed to growing our businesses in a direction that contributes to a sustainable and progressive Pakistan. In line with our commitment, we aim to provide a clean and reliable energy source by building and operating state of the art wind power facilities.



Figure 8 Master Wind Energy

**Master Power Private Limited:**

Power house is one of the major divisions of Master Group that takes care of the electricity needs of the whole mill. It is a versatile facility with a lot of power generation options including Gas Turbines, Gas Engines, Diesel Engines and Heavy Furnace Oil Engines. Power house ensures that the electricity supply to all the divisions of Company is continuous and without any interruption. As it is a multi-option power house so the load distribution on various sources is according to the cost analysis of per unit price. It is ensured to keep an eye on varying prices of different fuel sources so that the electricity generated is by cheapest available source. There is a Grid station of 8MW for WAPDA to manage and distribute this electricity. The detail of all the sources is as under



| Sr. No. | Source            | Make        | Generation Capacity |
|---------|-------------------|-------------|---------------------|
| 01      | Gas Turbines      | TURBOMACH   | 2*4.6 MW            |
| 02      | Gas Engines       | JENBACHER   | 4*2 MW              |
| 03      | HFO Generator Set | WARTSILA    | 6.7 MW              |
| 04      | HFO Generator Set | MAN         | 4.2 MW              |
| 05      | Diesel Generators | CATERPILLAR | 4*1 MW              |
| 06      | Grid Station 13KV |             | 8MW                 |

Table 2 Master Power Private Limited Details

So total capacity of power house of Master Group is 40MW and total self-generation capacity is 32 MW. There is a synchronizing system to manage all these sources in such a way that if one of the sources stops due to any reason, then other sources continue to supply electricity to some selected consumers to avoid total blackout. So power house ensures the smooth operation of whole company.

There are some utilities in power house that are not used for power generation but are equally important. These utilities include R.O. plant, Chiller Plant, Water turbines and Waste water plant. The major consumers of R.O. plant are boilers and the consumers of Chiller plants are weaving department, spinning department, main offices and gas Turbines.

#### Different Utilities with Capacity and Make

| Sr. No. | Source      | Make | Capacity  |
|---------|-------------|------|-----------|
| 1       | Chiller #01 | LG   | 570 USRT  |
| 2       | Chiller #02 | LG   | 1390 USRT |
| 3       | R.O. plants | CWG  | 2*20 TONS |

Table 3 Chillers at MPPL



## 2 Selected Projects for Primavera P-6 Report:

### Introduction:

Master Group never depends upon single energy source, by keeping it in mind Master Group has decided to produce electricity by using Coal. So in first phase Master group has started to install 1x20MW Coal Fired Power Plant and we have selected this project as an assignment for MS Project report.

### Location:

3kms off Raiwind, Manga-Mandi Road, District Lahore, Punjab, Pakistan

### Project Title:

1 x20MW Coal Fired Power Plant

### Project Objectives:

Project objective is to produce 20MW cheaper electricity by burning solid fuel that is coal.

### Project Critical Success Factors:

- Company & Vendor collaboration
- End product must meet business requirements.
- Project Team Development
- Effective communication
- Project Management as per Management Standards.

### External Dependencies:

- Boiler with auxiliaries is to be provided by Jinan Boiler Group P.R. China.
- Turbine, Generator, Condenser along with Auxiliaries is to be provided by HTC, P.R. China
- Power Plant Design is to be provided by SYEDI, P. R. China.
- BOP is to be supplied by SYEDI, P.R. China



Project Major Stakeholders:

- Master Group of Industries
- Main Project Sponsor; Master Textile Mills limited
- Master Project Management Team
- Jinan Boiler Group, P. R. China
- Shandong Yangguang Engineering Design Institute (SYEDI). P. R. China
- Hangzhou Steam Turbine Company, P. R. China
- MEC Engineering Company Pakistan
- Taheem Construction Company (TCC), Pakistan
- TUV Austria

Stakeholders Analysis:

| Sr# | Stakeholder                                                          | Power | Interest | Priority       |
|-----|----------------------------------------------------------------------|-------|----------|----------------|
| 1   | Master Group of Industries Management                                | High  | High     | Manage Closely |
| 2   | Main Project Sponsor; Master Textile Mills limited                   | High  | High     | Manage Closely |
| 3   | Master Project Management Team                                       | High  | High     | Manage Closely |
| 4   | Jinan Boiler Group, P. R. China                                      | Low   | High     | Keep Informed  |
| 5   | Shandong Yangguang Engineering Design Institute (SYEDI). P. R. China | Low   | High     | Keep Informed  |
| 6   | Hangzhou Steam Turbine Company, P. R. China                          | Low   | High     | Keep Informed  |
| 7   | MEC Engineering Company Pakistan                                     | Low   | High     | Keep Informed  |
| 8   | Taheem Construction Company (TCC),Pakistan                           | Low   | High     | Keep Informed  |
| 9   | TUV Austria                                                          | Low   | High     | Keep Informed  |

Table 4 Stakeholders Analysis



### 3 Project Scope Statement (PSS)

Document # MPPL/02

13<sup>th</sup>-April -2017



**Master Power Private Limited**

82-C-1, Gulberg-III, Lahore, Pakistan



**Business Objective:**

HFO & Diesel Oil prices are increasing day by day. It is very compulsory to have cheaper electricity for production, to survive in international market. Coal energy is very cheap as compare to HFO & Diesel so by doing this project, 30% cheaper electricity will be available for production.

**PROJECT OBJECTIVE:**

Project objective is to produce 20MW electricity by consuming coal with 4500 Kcal/kg. Project must be completed within time and budget.

**DELIVERABLES / TECHNICAL REQUIREMENTS:**

Engineering, Procurement & Construction of 20MW Coal Fired Power Plant which consists of Following Systems

**1. General**

- Complete Design of the Coal Fired Power Plant
- Overall descriptions & General Documents
- Operation & Maintenance Document & Staff Trainings

**2. Mechanical**

- 100TPH @ 98 Bar Circulating Fluidized Bed Coal Fired Boiler.
- 1x20MW Extraction Condensing Steam Turbine
- Water Supply System
- Steam Supply System
- Coal Crushing System
- Fuel handling & Supply System
- Fuel Feeding System
- Fuel storage System
- HFO & Natural Gas Supply System
- Ash handling & Transportation System
- Emission Control System
- CEMS System
- Firefighting system

- Complete Manuals, Test Documents and Commissioning Documents as per international standard for each equipment and overall system
3. Civil & Structure Work
- Complete Design, Procurement and Civil construction work
  - Ground area with concrete
  - Complete structure work design, Procurement & installation
4. Electrical System
- Complete Design, Procurement & Installation
  - UPS Diesel Generator System for Feed Water System
  - Diesel Generator System for Auxiliaries
  - Complete international standard documentation for each equipment
5. Instrument & Control System
- DCS Control System
  - Complete Design, Procurement & installation
6. HVAC System

**MILES STONES:**

- Electricity Generation License from NEPRA
- Basic Power Plant Design Completion
- Kick off Meeting
- Detail Design Completion
- Civil foundation work completion
- Chimney work completion
- Mechanical Erection Work Completion
- Project successful commissioning and test run for 72 hours



**LIMITS AND EXCLUSIONS:**

- Coal Transportation planning & Arrangements
- Ash disposing system or Bricks making plant
- Deep Well Turbine for Ground Water
- Anything which is not clearly mention in project scope statement

**Project Major Risk:**

- Change in higher management during planning phase.
- Cost overrun due to low bearing strength of project site soil and delay in project completion due to pilling work.

**Assumptions:**

- One dollar is equal to 103 PKR.
- Project will be completed within 19-months.
- Project will not increase more than USD 20,000,000/-

**4 Project Charter:**

| Project Charter   |                             |                                                                                                                                                 |              |          |
|-------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------|
| Document# MPPL/03 |                             |                                                                                                                                                 |              |          |
| A                 | General Project Information |                                                                                                                                                 |              |          |
|                   | Project Name:               | 1x20MW Coal Fired Power Plant                                                                                                                   |              |          |
|                   | Project Sponsor:            | Master Group of Industries                                                                                                                      |              |          |
|                   | Impact of Project:          | 30% Cheaper Electricity will be available for Textile & Molyfoam production. As a result more competitive products will be available in market. |              |          |
| B                 | Project Team:               |                                                                                                                                                 |              |          |
|                   | Name                        | Designation                                                                                                                                     | Contact#     | Email ID |
| 1                 | Mr. Imran Khan              | Project Manager                                                                                                                                 | 0320-7700300 |          |



|   |                                                                                                                                                                                                                                                        |                    |             |  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|--|
| 2 | Mr. Shahzad                                                                                                                                                                                                                                            | Project Engineer   | 320-7700544 |  |
| 3 | Mr. Khalid Mehmood                                                                                                                                                                                                                                     | Executive Director |             |  |
| C | Stakeholders:                                                                                                                                                                                                                                          |                    |             |  |
| 1 | Master Group of Industries                                                                                                                                                                                                                             |                    |             |  |
| 2 | Master Textile Mills Limited                                                                                                                                                                                                                           |                    |             |  |
| 3 | Jinan Boiler Group Co. Ltd, Jinan, P. R. China                                                                                                                                                                                                         |                    |             |  |
| 4 | Hangzhou Steam Turbine (HTC), Hangzhou, P. R. China                                                                                                                                                                                                    |                    |             |  |
| 5 | Shandong Province Yonggyong Engineering Design Institute (SYEDI), Jinan, P. R. China                                                                                                                                                                   |                    |             |  |
| 6 | Theem Construction Company (TCC) Lahore, Pakistan                                                                                                                                                                                                      |                    |             |  |
| 7 | Etimaad Engineering Company, Lahore, Pakistan                                                                                                                                                                                                          |                    |             |  |
| 8 | Tuv Austria, Lahore office, Pakistan                                                                                                                                                                                                                   |                    |             |  |
| D | Project Scope Statement:                                                                                                                                                                                                                               |                    |             |  |
| 1 | Project purpose/Business Justification:                                                                                                                                                                                                                |                    |             |  |
|   | Electricity cost has a major impact on production. MTML using 12MW electricity from WAPDA & generate by using Gas/Liquid fuel. Electricity cost is about 13 PKR per unit. Now by doing this project we will reduce electricity unit rate cost by 4PKR. |                    |             |  |
| 3 | Project Scope                                                                                                                                                                                                                                          |                    |             |  |
|   | Engineering, Procurement & Construction of 1x20MW Coal Fired Power Plant                                                                                                                                                                               |                    |             |  |
| E | Project Time Line:                                                                                                                                                                                                                                     |                    |             |  |
| 1 | Project Starting Date                                                                                                                                                                                                                                  | 1st-July-2016      |             |  |
| 2 | Project Completion Date                                                                                                                                                                                                                                | 15th-Jan-2018      |             |  |
| F | Project Budget                                                                                                                                                                                                                                         |                    |             |  |
|   | 1x20MW CFPP                                                                                                                                                                                                                                            | USD 20,000,000/-   |             |  |
| G | Project Milestones                                                                                                                                                                                                                                     |                    |             |  |
| 1 | Project Layout Finalization                                                                                                                                                                                                                            |                    |             |  |
| 2 | L/C Establishing for Design Institute & Basic Engineering Design Completion                                                                                                                                                                            |                    |             |  |
| 3 | Detail Engineering Design Completion                                                                                                                                                                                                                   |                    |             |  |
| 4 | Boiler, Turbine & BOP L/C Establishing                                                                                                                                                                                                                 |                    |             |  |
| 5 | Boiler, Turbine & BOP Erection Completion                                                                                                                                                                                                              |                    |             |  |



|   |                                                                                                                                    |  |                 |  |                  |
|---|------------------------------------------------------------------------------------------------------------------------------------|--|-----------------|--|------------------|
| 6 | Boiler, Turbine & BOP Commissioning                                                                                                |  |                 |  |                  |
| 7 | Power Plant Commercial Operation                                                                                                   |  |                 |  |                  |
| H | Project Success Criteria                                                                                                           |  |                 |  |                  |
| 3 | At completion date, 17MW Electricity must be available for MTML.                                                                   |  |                 |  |                  |
| 4 | Power Plant overall efficiency in terms of energy must be more than 40%                                                            |  |                 |  |                  |
| 5 | Operation & Maintenance cost must not increase by 15% of unit cost.                                                                |  |                 |  |                  |
| I | Major Risk                                                                                                                         |  |                 |  |                  |
| 1 | 70% Procurement is from P.R China, So it is possible delay in supply of equipment.                                                 |  |                 |  |                  |
| 2 | Change of higher Management due to any reason                                                                                      |  |                 |  |                  |
| 3 | Power Plant designer is from China, So it is possible conflicts between designer & Erection companies which will be from Pakistan. |  |                 |  |                  |
| J | Communication Strategy:                                                                                                            |  |                 |  |                  |
| 1 | International communication will be through Email & Courier                                                                        |  |                 |  |                  |
| 2 | Local Communication through Email, Meetings, Courier                                                                               |  |                 |  |                  |
| K | Sign Off                                                                                                                           |  |                 |  |                  |
|   | Project Manager                                                                                                                    |  | Project Sponsor |  | Project Director |
|   |                                                                                                                                    |  |                 |  |                  |

## 5 Schedule Management Plant (SMP)

Document # MPPL/04

13<sup>th</sup>-April -2017



**Master Power Private Limited**

82-C-1, Gulberg-III, Lahore, Pakistan



## 1. Introduction:

The project schedule is the guide for how a 20MW Coal Fired Power Plant Project (hereinafter referred as "Project") will be completed and finished. Schedules are very critical part of any project because they provide the project team and sponsor a visual picture of the project's standing at any given time. The purpose of the schedule management plan is to define the technique the project team will use in creating the project schedule. This plan also comprises how the team oversee the project schedule and manages changes after the standard schedule has been approved. This includes identifying, analyzing, documenting, prioritizing, approving or rejecting, and publishing all schedule-related changes.

## 2. Schedule Management Approach:

Project schedules will be made using Primavera P-6. Activity definition will identify the specific work packages, which must be performed to complete each deliverable. Activity sequencing will be used to determine the order of work packages and assign relationships between project activities. Activity duration estimating will be used to calculate the number of work Hours required to complete work packages. Resource estimating will be used to assign resources to work packages in order to complete schedule development.

Once an initial schedule has been developed, the project team and any resources will assess it carefully assigned to project tasks. The project team and resources must agree to the proposed work package assignments, durations, and schedule. Once this is achieved the project sponsor will review and approve the schedule and it will then be baseline.

**The following will be designated as Project Mile Stones.**

- Sign Design & Consultation Contract
- Complete Plot Plan
- Kick off Meeting
- 1<sup>st</sup> Concrete Pouring for Foundations
- 1<sup>st</sup> Steel Structure Erection (Boiler)
- Chimney to Top Completed

- Turbine and Coal Bunker Building roof Finished
- Steam Turbine Start Installation
- Steam Drum Hoisting Finished
- Hydraulic Test of Boiler
- Unit Start Up & Test

The project manager will be responsible for facilitating work package definition, sequencing, and estimating duration and resources with the project team. The project manager will also create the project schedule using Primavera P-6 and validate the schedule with the project team, stakeholders. The project manager will obtain schedule approval from the stakeholders and baseline the schedule.

The project team is responsible for participating in work, and duration and resource estimating. The project team will also review and validate the proposed schedule and perform assigned activities once the schedule is approved.

The project stakeholders will participate in reviews of the proposed schedule, assist in its validation and approve the final schedule before it is baseline.

### **3. SCHEDULE CONTROL:**

The project schedule will be reviewed and updated as necessary when new or old information is added or deleted. It will include the actual start, finish and percentages of the completion.

The project manager is responsible for holding schedule updates/reviews. Also determining schedule modifications. Submitting schedule change requests and reporting schedule status in accordance with the project's communications plan will be left up to the project manager.

The project team is responsible for participating schedule updates/reviews. The team must communicate any changes of the actual start/finish dates to the project manager. Finally the team will participate in schedule variance resolution activities as needed.

The project stakeholder will maintain awareness of the project schedule status and review/approve any schedule change requests submitted by the project manager.



#### 4. SCHEDULE CHANGES AND THRESHOLDS:

If any member of the project team determines that a modification to the schedule is essential, the project manager and team will meet to assessment and evaluate the change. The project manager and project team must conclude which tasks will be impacted, variance as a result of the potential change, and any alternatives or variance resolution activities they may employ to see how they would affect the scope, schedule, and resources. If, after this evaluation is complete, the project manager determines that any change will surpass the established boundary conditions, then a schedule change request must be submitted.

Submittal of a schedule change request to the project stakeholder for approval is required if either of the two following conditions is true:

- The proposed change is estimated to reduce the duration of an individual work package by 5% or more, or increase the duration of an individual work package by 10% or more.
- The change is estimated to reduce the duration of the overall baseline schedule by 5% or more, or increase the duration of the overall baseline schedule by 2% or more.

Once the change request has been reviewed and approved the project manager is responsible for adjusting the schedule and communicating all changes and impacts to the project team and stakeholders. The project manager must also ensure that all change requests are archived in the project records repository.

#### SCOPE CHANGE

Any changes in the project scope, which have been approved by the project stakeholder, will require the project team to evaluate the outcome of the scope changes on the current schedule. If the project manager determines that the scope change will significantly affect the current project schedule, they may demand that the schedule be re-baselined in concern of any changes, which need to be made as part of the new project scope. The project stakeholder must review and approve this request before the schedule can be re-baselined.

Approved By:

Name: .....

Sign & Stamp:

Project Sponsor: Master Group of Industries

13<sup>th</sup> -April-2017

.....The End.....

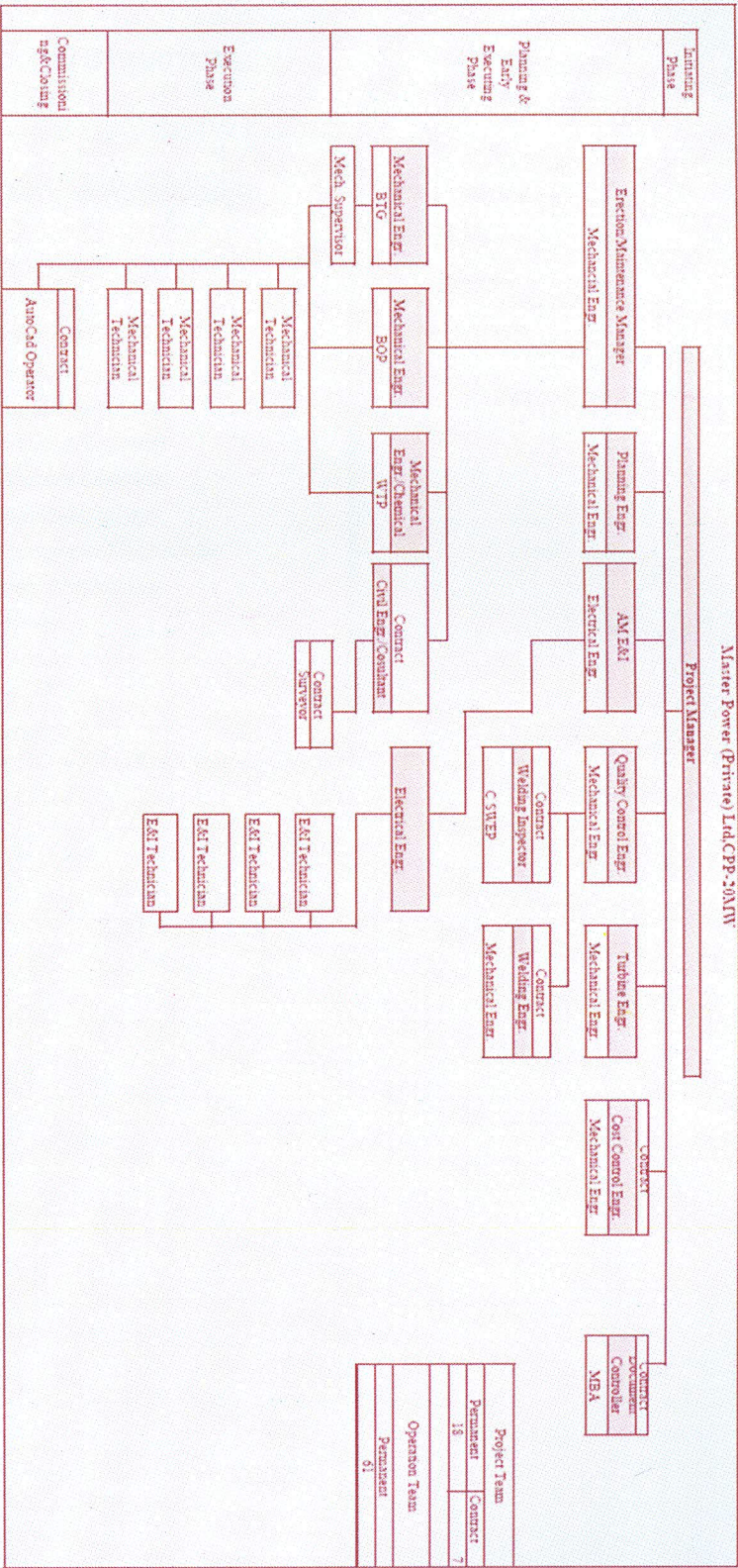


6 PROJECT HIGH LEVEL RISKS:

| Master Power Private Limited |             |                                                     |          |                                                                    |                                                          |                                    |                                              |                                                                 |                        |                                                    |
|------------------------------|-------------|-----------------------------------------------------|----------|--------------------------------------------------------------------|----------------------------------------------------------|------------------------------------|----------------------------------------------|-----------------------------------------------------------------|------------------------|----------------------------------------------------|
| Project Name:                |             | 1x20MW Coal Fired Power Plant                       |          |                                                                    |                                                          |                                    |                                              |                                                                 |                        |                                                    |
| Project Manager              |             | Mr. Imran Khan                                      |          |                                                                    |                                                          |                                    |                                              |                                                                 |                        |                                                    |
| Project Description          |             | Coal Fired Power Plant, To Produce 20MW Electricity |          |                                                                    |                                                          |                                    |                                              |                                                                 |                        |                                                    |
| ID                           | Risk Impact | Probability of Occurrence                           | Risk Map | Risk Description                                                   | Project Impact                                           | Project Owner                      | Symptoms                                     | Triggers                                                        | Risk Response Strategy | Contingency Plan                                   |
| 1                            | High        | Medium                                              | Red      | 20MW Electricity Generation License from NEPRA                     | Not possible to do project without approval from NEPRA   | Executive Director/Project Manager | Government decided to do Coal Fired Projects | If NEPRA start to reject application without any major reason   | Mitigation             | Invest more money to convince NEPRA Management     |
| 2                            | High        | Medium                                              | Red      | No Objection Certificate (NOC) From Pak-EPA                        | Not possible to do project without approval from Pak-EPA | Executive Director/Project Manager | Project site is very near to Populated Area  | If Pak-EPA start to reject application without any major reason | Mitigation             | Fulfill the requirements of Pak-EPA, change design |
| 3                            | High        | High                                                | Red      | Piling Work for Water Treatment Building & Coal crusher Building   | Cost Overrun                                             | Civil                              | Heavy Static & Dynamic load                  | Soil Investigation Reports                                      | Contingency            | Use Contingency Reserves                           |
| 4                            | Medium      | High                                                | Red      | Boiler, Turbine & BOP L/C Establishment                            | Project Delay                                            | Executive Director/Project Manager | L/C amount & Advance is too much             | L/C rejected by SBP                                             | Mitigation             | Fulfill the requirements of SBP                    |
| 5                            | Medium      | High                                                | Red      | First shipment Custom Clearance                                    | Project Delay                                            | Mechanical Team                    | MPPL First Shipment                          | Serious Objection                                               | Mitigation             | Issue Shipment against BG                          |
| 6                            | Medium      | Medium                                              | Yellow   | BOP Contract Delayed                                               | Project Delay                                            | Mechanical Team                    | Delay in TG L/C                              | contract & L/C for BOP close after TG L/C                       | Mitigation             | Speed up Turbine L/C Process                       |
| 7                            | Medium      | Medium                                              | Yellow   | Minimum Time Required for KSB Pumps Manufacturing & Supply         | Boiler Commissioning Can Delay                           | Mechanical Team                    | BOP Contract Delayed                         | Ksb minimum 8.5months required to manufacture                   | Mitigation             | Arrange separate L/C for Ksb Pumps                 |
| 8                            | High        | Medium                                              | Red      | BOP Contractor have about 25 Sub Vendors                           | Delay in Equipment supply                                | Erection Team                      | With in Six months supply all equipments     | Payment delayed                                                 | Mitigation             | Arrange advance in T/T                             |
| 9                            | Medium      | Medium                                              | Yellow   | Site Area is very congested, very difficult activities in parallel | Project Delay                                            | Erection Team                      | Due to delay work in parallel activities     | delay in civil contract                                         | Mitigation             | start work as soon as possible                     |

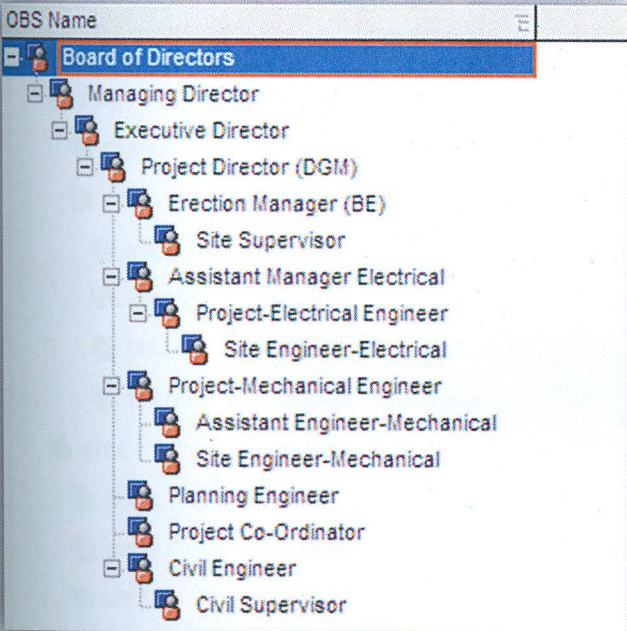


7 ORGANOGRAM MPPL:





8 ORGANIZATION BREAKDOWN STRUCTURE:



9 WORK BREAK DOWN STRUCTURE (WBS):

|           |                               | 20MW Coal Fired  |              |
|-----------|-------------------------------|------------------|--------------|
| WBS Code  | WBS Name                      | Total Activities | Actual Start |
| CPP       | 1X20MW Coal Fired Power Plant | 61               | 01-Jul-16    |
| CPP.1     | Project Milestones            | 7                | 01-Jul-16    |
| CPP.2     | Engineering                   | 10               | 01-Jul-16    |
| CPP.2.5   | Basic Engineering             | 2                | 01-Jul-16    |
| CPP.2.6   | Detail Engineering            | 8                | 01-Jul-16    |
| CPP.2.6.2 | Civil                         | 2                | 01-Jul-16    |
| CPP.2.6.1 | Mechanical                    | 2                |              |
| CPP.2.6.7 | Electrical                    | 2                | 07-Aug-16    |
| CPP.2.6.8 | Instrumentation & Control     | 2                | 07-Aug-16    |
| CPP.3     | Procurement                   | 10               | 01-Jul-16    |
| CPP.3.1   | Civil                         | 1                | 01-Jul-16    |
| CPP.3.4   | Mechanical                    | 6                | 01-Jul-16    |
| CPP.3.3   | Electrical                    | 1                | 01-Jul-16    |
| CPP.3.2   | Instrument Control            | 2                |              |
| CPP.4     | Construction                  | 29               | 01-Jul-16    |
| CPP.4.1   | Civil Work                    | 6                | 01-Jul-16    |
| CPP.4.2   | Mechanical Work               | 18               | 01-Jul-16    |
| CPP.4.5   | Electrical Work               | 3                |              |
| CPP.4.4   | Instrument & Control Work     | 2                |              |
| CPP.5     | Commissioning                 | 5                |              |



## 10 CONCLUSION

1x20MW Coal Fired Power Plant has a lot of activities with dependencies it is not possible to manage time, cost and schedule without software. When we start working with Master Power Private Limited to analyze their management style. They normally prefer to work on excel instead of project management Softwares. So in this way they were facing a lot of problem like

1. Delay in projects
2. Difficulties in report making
3. Cost Overrun
4. Lack of cost over run and schedule variance in forecasting.

It is concluded that it is very easy to management projects by using Primavera P-6.

## 11 RECOMMENDATIONS

It is recommended for Master Power Private Limited to follow complete PMI project management approach for all projects to management properly. In planning phase prepare complete project documents and prepare project plan on MS Project or Primavera P-6.

12 PROJECT AUTO GENERATED REPORTS:

ACTIVITY LIST:

| 1X20MW Coal Fired Power Plant<br>Report Date 10-Jun-17 00:09 |             | SR-07 Activity Breakdown By WBS     |                  | Project Start 01-Jul-16<br>Project Finish 22-Dec-17<br>Data Date 01-Jul-16 |  |
|--------------------------------------------------------------|-------------|-------------------------------------|------------------|----------------------------------------------------------------------------|--|
| WBS                                                          | Activity ID | Activity Name                       | Activity Type    | Activity Status                                                            |  |
| MG                                                           |             | Master Group of Industries          |                  |                                                                            |  |
| MPPL                                                         |             | Master Power Private Limited        |                  |                                                                            |  |
| CPP                                                          |             | 1X20MW Coal Fired Power Plant       |                  |                                                                            |  |
|                                                              | CPP.1       | Project Milestones                  |                  |                                                                            |  |
|                                                              | A1040       | NEPRALicense                        | Start Milestone  | Not Started                                                                |  |
|                                                              | A1060       | Basic Design Completion             | Finish Milestone | Not Started                                                                |  |
|                                                              | A1070       | Kick off meeting                    | Task Dependent   | Not Started                                                                |  |
|                                                              | A1080       | Civil Foundation Work Completion    | Task Dependent   | Not Started                                                                |  |
|                                                              | A1090       | Mechanical Erection Work Completion | Start Milestone  | Not Started                                                                |  |
|                                                              | A1100       | Plant Commissioning Completion      | Task Dependent   | Not Started                                                                |  |
|                                                              | A1120       | Final Power Plant Startup           | Task Dependent   | Not Started                                                                |  |
|                                                              | CPP.2       | Engineering                         |                  |                                                                            |  |
|                                                              | CPP.2.5     | Basic Engineering                   |                  |                                                                            |  |
|                                                              | A1010       | Basic Design Completion             | Task Dependent   | Completed                                                                  |  |
|                                                              | A1050       | Basic Design Review                 | Task Dependent   | Completed                                                                  |  |
|                                                              | CPP.2.6     | Detail Engineering                  |                  |                                                                            |  |
|                                                              | CPP.2.6.2   | Civil                               |                  |                                                                            |  |
|                                                              | A1130       | Civil Detail Design Completion      | Task Dependent   | Completed                                                                  |  |
|                                                              | A1520       | Civil Detail Design Review          | Task Dependent   | Completed                                                                  |  |
|                                                              | CPP.2.6.1   | Mechanical                          |                  |                                                                            |  |
|                                                              | A1140       | Mechanical Detail Design Completion | Task Dependent   | Completed                                                                  |  |
|                                                              | A1530       | Mechanical Detail Design Review     | Task Dependent   | Completed                                                                  |  |
|                                                              | CPP.2.6.7   | Electrical                          |                  |                                                                            |  |
|                                                              | A1150       | Electrical Detail Design Completion | Task Dependent   | In Progress                                                                |  |
|                                                              | A1540       | Electrical Detail Design Review     | Task Dependent   | Completed                                                                  |  |



1X200MW Coal Fired Power Plant  
Report Date 10-Jun-17 00:09

Project Start 01-Jul-16  
Project Finish 22-Dec-17  
Data Date 01-Jul-16

## SR-07 Activity Breakdown By WBS

| WBS                                | Activity ID                | Activity Name                      | Activity Type  | Activity Status |
|------------------------------------|----------------------------|------------------------------------|----------------|-----------------|
| CPP2.6.8 Instrumentation & Control |                            |                                    |                |                 |
|                                    | A1150                      | Control System Detail Design       | Task Dependent | Completed       |
|                                    | A1550                      | Review                             | Task Dependent | Completed       |
| CPP.3 Procurement                  |                            |                                    |                |                 |
|                                    | CPP.3.1 Civil              |                                    |                |                 |
|                                    | A1020                      | Civil Contractor Finalization      | Task Dependent | In Progress     |
|                                    | CPP.3.4 Mechanical         |                                    |                |                 |
|                                    | A1170                      | Soler, Fans & Auxiliaries          | Task Dependent | Completed       |
|                                    | A1180                      | Turbine, Gear Box & Generator      | Task Dependent | Not Started     |
|                                    | A1190                      | Balance of Plant (BOP) Mechanical  | Task Dependent | Not Started     |
|                                    | A1510                      | Power Plant Design Purchasing      | Task Dependent | Completed       |
|                                    | A1590                      | Water Treatment Plant              | Task Dependent | Completed       |
|                                    | A1650                      | Mechanical Contractor Finalization | Task Dependent | In Progress     |
|                                    | CPP.3.3 Electrical         |                                    |                |                 |
|                                    | A1500                      | Balance of Plant (BOP) Electrical  | Task Dependent | Not Started     |
|                                    | CPP.3.2 Instrument Control |                                    |                |                 |
|                                    | A1220                      | DCS System                         | Task Dependent | Not Started     |
|                                    | A1230                      | Instrumentation                    | Task Dependent | Not Started     |
|                                    | CPP.4 Construction         |                                    |                |                 |
|                                    | CPP.4.1 Civil Work         |                                    |                |                 |
|                                    | A1240                      | Boiler Foundations & Building      | Task Dependent | Not Started     |
|                                    | A1250                      | Turbine Foundations & Building     | Task Dependent | Not Started     |
|                                    | A1260                      | Balance of Plant (BOP) Foundations | Task Dependent | Not Started     |
|                                    | A1450                      | Bag Filters Foundations            | Task Dependent | Not Started     |
|                                    | A1460                      | FGD Foundation                     | Task Dependent | Not Started     |

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Project Start 01-Jul-16  
Project Finish 22-Dec-17  
Data Date 01-Jul-16

## SR-07 Activity Breakdown By WBS

1X20MW Coal Fired Power Plant  
Report Date 10-Jun-17 00:09

## WBS

| Activity ID                       | Activity Name                              | Activity Type  | Activity Status |
|-----------------------------------|--------------------------------------------|----------------|-----------------|
| A1470                             | Cooling Towers Civil Work                  | Task Dependent | Not Started     |
| CPP.4.2 Mechanical Work           |                                            |                |                 |
| A1270                             | Boiler Steel Structure Installation        | Task Dependent | Not Started     |
| A1280                             | Fans Installation                          | Task Dependent | Not Started     |
| A1290                             | Pipe Lines Installation                    | Task Dependent | Not Started     |
| A1300                             | Turbine, Gear Box & Generator Installation | Task Dependent | Not Started     |
| A1310                             | Balance of Plant (BOP) Installation        | Task Dependent | Not Started     |
| A1410                             | Boiler Pressure part Installation          | Task Dependent | Not Started     |
| A1420                             | Boiler Drum Installation                   | Task Dependent | Not Started     |
| A1430                             | Bag Filters Installation                   | Task Dependent | Not Started     |
| A1440                             | FGD Installation                           | Task Dependent | Not Started     |
| A1480                             | Cooling Towers Installation                | Task Dependent | Not Started     |
| A1560                             | Conveyors Installation                     | Task Dependent | Not Started     |
| A1570                             | Water Treatment Plant Installation         | Task Dependent | Not Started     |
| A1580                             | Water Tanks Installation                   | Task Dependent | Not Started     |
| A1600                             | Ducts Installation                         | Task Dependent | Not Started     |
| A1610                             | Bottom Ash Silo Fabrication & Installation | Task Dependent | Not Started     |
| A1620                             | Fly Ash Silo Fabrication & Installation    | Task Dependent | Not Started     |
| A1630                             | Limestone Silo Fabrication & Installation  | Task Dependent | Not Started     |
| A1640                             | Boiler Hydraulic Test                      | Task Dependent | Not Started     |
| CPP.4.5 Electrical Work           |                                            |                |                 |
| A1320                             | VFD's & Panel Installation                 | Task Dependent | Not Started     |
| A1330                             | Cable Laying                               | Task Dependent | Not Started     |
| A1490                             | Transformer Installation                   | Task Dependent | Not Started     |
| CPP.4.4 Instrument & Control Work |                                            |                |                 |

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1X20MW Coal Fired Power Plant  
Report Date 10-Jun-17 00:09

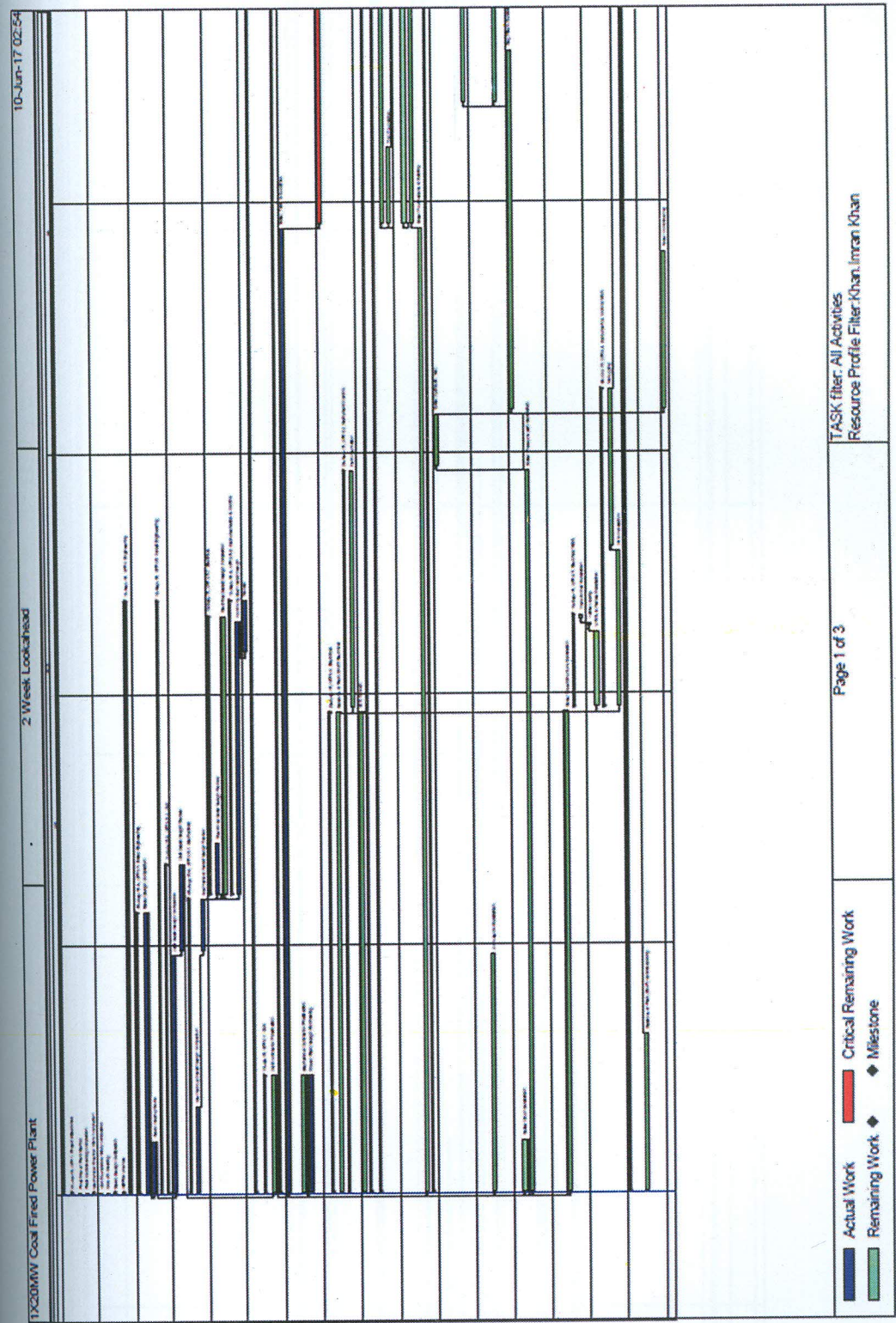
Project Start 01-Jul-16  
Project Finish 22-Dec-17  
Data Date 01-Jul-16

# SR-07 Activity Breakdown By WBS

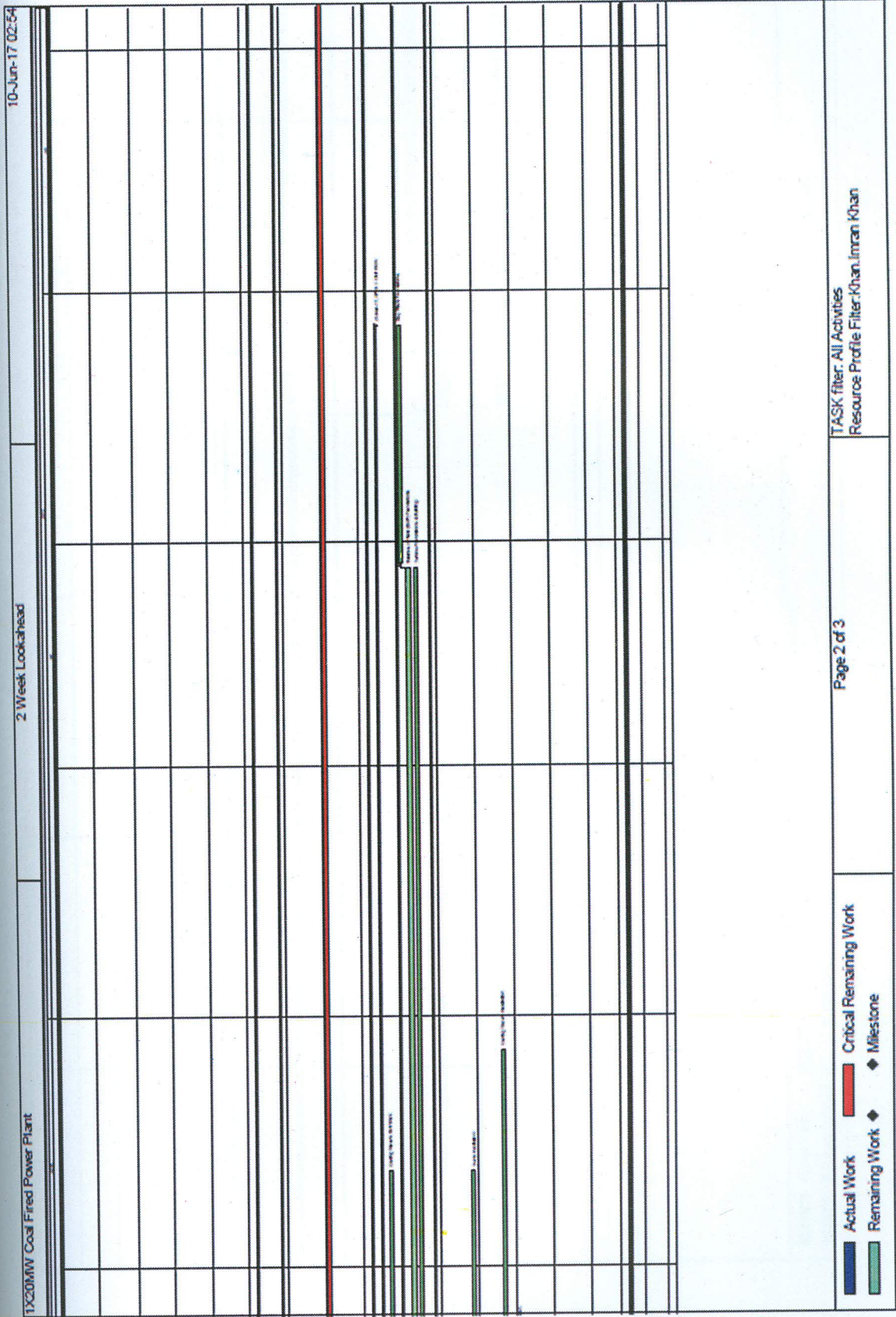
| WBS | Activity ID | Activity Name                        | Activity Type  | Activity Status |
|-----|-------------|--------------------------------------|----------------|-----------------|
|     | A1340       | DCS Installation                     | Task Dependent | Not Started     |
|     | A1350       | Debugging                            | Task Dependent | Not Started     |
|     | CPP.S       | Commissioning                        |                |                 |
|     | A1360       | Boiler Commissioning                 | Task Dependent | Not Started     |
|     | A1370       | Turbine Commissioning                | Task Dependent | Not Started     |
|     | A1380       | Boiler, Turbine, BOP Integration     | Task Dependent | Not Started     |
|     | A1390       | Balance of Plant (BOP) Commissioning | Task Dependent | Not Started     |
|     | A1400       | Power Plant Startup                  | Task Dependent | Not Started     |

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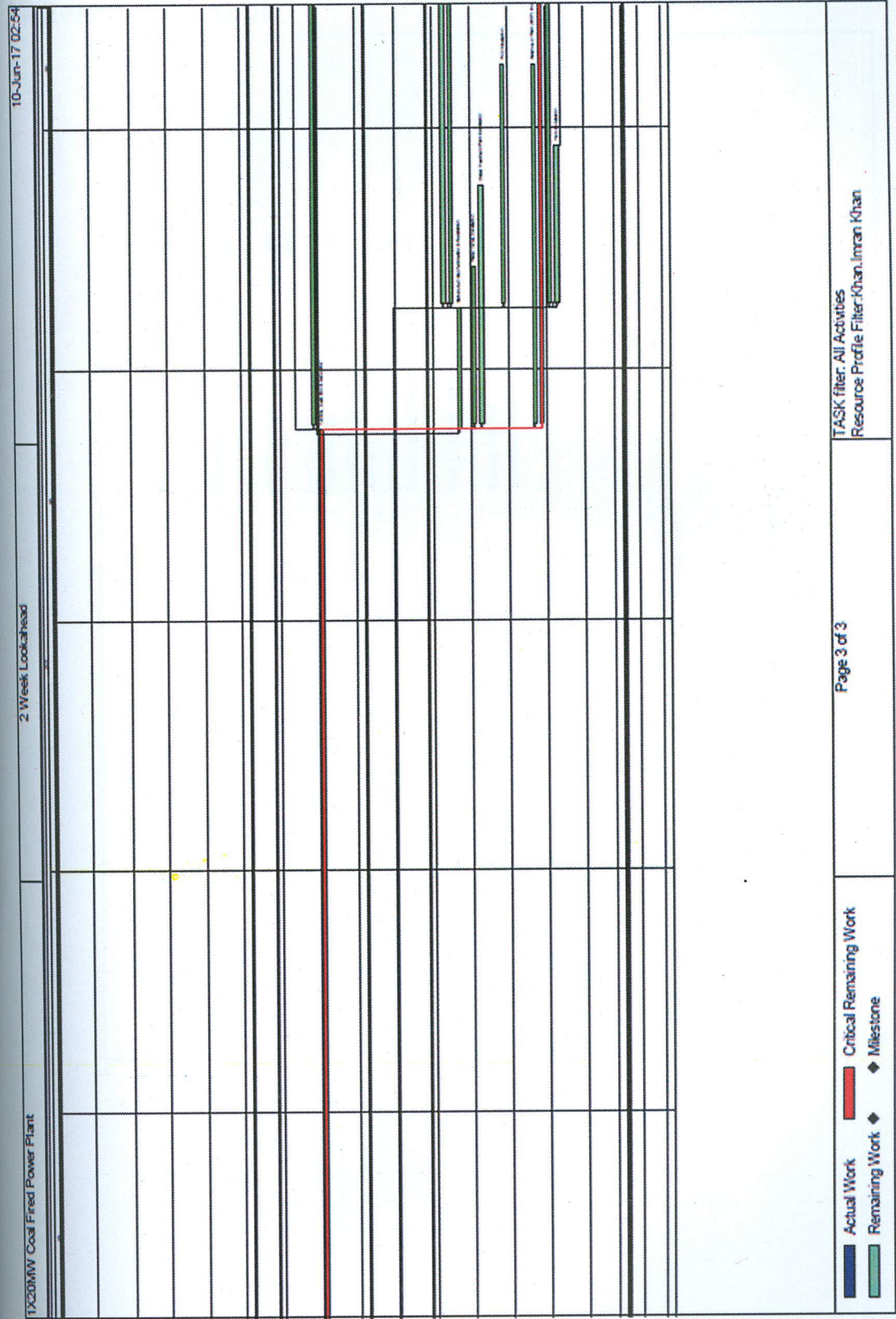
13 Chant Chart:









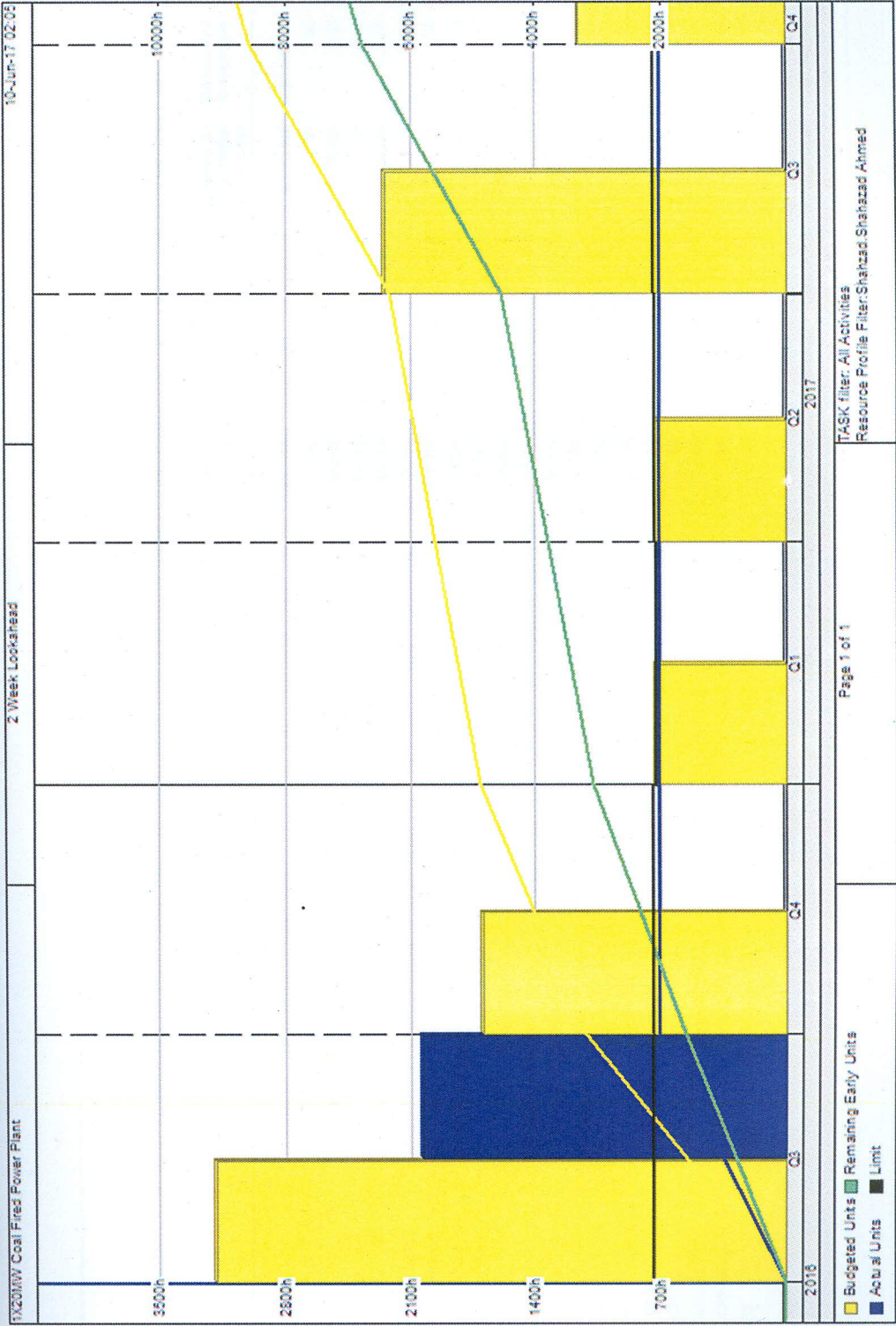




14 Resource Details:

| RS-01 Resource Details                                                                             |                                                  |                               |                      |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------|----------------------|
| Resource ID                                                                                        | Resource Name                                    | Primary Role                  | Default Units / Time |
| Maik R<br>Khalid Khan<br>Ameer Hameed<br>Tahir Nouran<br>Hanif Shahzad<br>Zeeshan Kamran<br>Salman | Najeeb Malik<br>(New Resource)                   | Managing Director             | 8/d                  |
|                                                                                                    | Khalid Mehmood                                   | Executive Director            | 8/d                  |
|                                                                                                    | Imran Khan                                       | Project Manager               | 8/d                  |
|                                                                                                    | Muhammad Ameer                                   | Erection Manager              | 8/d                  |
|                                                                                                    | Abdul Hameed                                     | Supervisor                    | 8/d                  |
|                                                                                                    | Tahir Mehmood                                    | Assistant Manager Electrical  | 8/d                  |
|                                                                                                    | Muhammad Nouran                                  | Project Engineer Electrical   | 8/d                  |
|                                                                                                    | Muhammad Hanif                                   | Site Engineer Electrical      | 8/d                  |
|                                                                                                    | Shahzad Ahmed                                    | Project Engineer Mechanical   | 8/d                  |
|                                                                                                    | Muhammad Zeeshan                                 | Assistant Engineer Mechanical | 8/d                  |
| TCC<br>WTP<br>BOP<br>JB<br>Designer<br>MEC<br>HTC<br>SYEDI<br>Siemens<br>SUPCON<br>AMA             | Kamran Shahzad                                   | Planning Engineer             | 8/d                  |
|                                                                                                    | Muhammad Salman                                  | Project Coordinator           | 8/d                  |
|                                                                                                    | Theem Construction Company                       |                               | 0/d                  |
|                                                                                                    | Water Treatment Plant                            |                               | 0/d                  |
|                                                                                                    | Balance of Plant                                 |                               | 0/d                  |
|                                                                                                    | Jiran Boiler                                     |                               | 0/d                  |
|                                                                                                    | SYEDI                                            |                               | 0/d                  |
|                                                                                                    | MEC Engineering Company                          |                               | 0/d                  |
|                                                                                                    | Hangzhou Steam Turbine Company                   |                               | 0/d                  |
|                                                                                                    | Shandong Youngguang Engineering Design Institute |                               | 8/d                  |
| Total                                                                                              | Siemens Pakistan                                 |                               | 0/d                  |
|                                                                                                    | Supcon China                                     |                               | 0/d                  |
|                                                                                                    | AAAS050255                                       |                               | 8/d                  |
| Total                                                                                              |                                                  |                               | ---                  |
| © Primavera Systems, Inc.                                                                          |                                                  |                               |                      |
|                                                                                                    |                                                  |                               | Page 1 of 1          |

15 S CURVES





16 WBS Earned VALUES

| PW-01 WBS Earned Value |                               |                    |                   |             |                      |                      |                             |                        |  |
|------------------------|-------------------------------|--------------------|-------------------|-------------|----------------------|----------------------|-----------------------------|------------------------|--|
| WBS Code               | WBS Name                      | Planned Value Cost | Earned Value Cost | Actual Cost | Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |  |
| CPP                    | 1X20MW Coal Fired Power Plant | \$0                | \$5,910,720       | \$10,840    | \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |  |
| CPP.1                  | Project Milestones            | \$0                | \$0               | \$0         | \$0                  | \$0                  | \$0                         | \$0                    |  |
| CPP.2                  | Engineering                   | \$0                | \$4,960           | \$4,960     | \$5,920              | \$960                | \$5,920                     | \$0                    |  |
| CPP.2.5                | Basic Engineering             | \$0                | \$1,184           | \$1,184     | \$1,184              | \$0                  | \$1,184                     | \$0                    |  |
| CPP.2.6                | Detail Engineering            | \$0                | \$3,776           | \$3,776     | \$4,736              | \$960                | \$4,736                     | \$0                    |  |
| CPP.2.6.2              | Civil                         | \$0                | \$1,184           | \$1,184     | \$1,184              | \$0                  | \$1,184                     | \$0                    |  |
| CPP.2.6.1              | Mechanical                    | \$0                | \$1,184           | \$1,184     | \$1,184              | \$0                  | \$1,184                     | \$0                    |  |
| CPP.2.6.7              | Electrical                    | \$0                | \$224             | \$224       | \$1,184              | \$960                | \$1,184                     | \$0                    |  |
| CPP.2.6.8              | Instrumentation & Control     | \$0                | \$1,184           | \$1,184     | \$1,184              | \$0                  | \$1,184                     | \$0                    |  |
| CPP.3                  | Procurement                   | \$0                | \$5,905,760       | \$5,880     | \$15,721,600         | \$7,715,960          | \$7,721,840                 | \$7,999,760            |  |
| CPP.3.1                | Civil                         | \$0                | \$1,600,000       | \$120       | \$3,200,000          | \$120                | \$240                       | \$3,199,760            |  |
| CPP.3.4                | Mechanical                    | \$0                | \$4,305,760       | \$5,760     | \$9,519,680          | \$4,713,920          | \$4,719,680                 | \$4,800,000            |  |
| CPP.3.3                | Electrical                    | \$0                | \$0               | \$0         | \$1,501,920          | \$1,501,920          | \$1,501,920                 | \$0                    |  |
| CPP.3.2                | Instrument Control            | \$0                | \$0               | \$0         | \$1,500,000          | \$1,500,000          | \$1,500,000                 | \$0                    |  |
| CPP.4                  | Construction                  | \$0                | \$0               | \$0         | \$38,272             | \$38,272             | \$38,272                    | \$0                    |  |
| CPP.4.1                | Civil Work                    | \$0                | \$0               | \$0         | \$14,240             | \$14,240             | \$14,240                    | \$0                    |  |
| CPP.4.2                | Mechanical Work               | \$0                | \$0               | \$0         | \$22,368             | \$22,368             | \$22,368                    | \$0                    |  |
| CPP.4.5                | Electrical Work               | \$0                | \$0               | \$0         | \$384                | \$384                | \$384                       | \$0                    |  |
| CPP.4.4                | Instrument & Control Work     | \$0                | \$0               | \$0         | \$1,280              | \$1,280              | \$1,280                     | \$0                    |  |
| CPP.5                  | Commissioning                 | \$0                | \$0               | \$0         | \$9,600              | \$9,600              | \$9,600                     | \$0                    |  |
| Total                  |                               | \$0                | \$5,910,720       | \$10,840    | \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |  |

AC-01 Activity Earned Value

| Activity ID                          | Activity Name                       | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|--------------------------------------|-------------------------------------|-----------------|--------------------|-------------------|-------------|
| <b>Master Group of Industries</b>    |                                     |                 |                    |                   |             |
| <b>Master Power Private Limited</b>  |                                     |                 |                    |                   |             |
| <b>1X20MW Coal Fired Power Plant</b> |                                     |                 |                    |                   |             |
| CPP.1                                | <b>Project Milestones</b>           |                 |                    |                   |             |
| A1040                                | NEPRA License                       | Not Started     | \$0                | \$0               | \$0         |
| A1060                                | Basic Design Completion             | Not Started     | \$0                | \$0               | \$0         |
| A1070                                | Kick off meeting                    | Not Started     | \$0                | \$0               | \$0         |
| A1080                                | Civil Foundation Work Completion    | Not Started     | \$0                | \$0               | \$0         |
| A1090                                | Mechanical Erection Work Completion | Not Started     | \$0                | \$0               | \$0         |
| A1100                                | Plant Commissioning Completion      | Not Started     | \$0                | \$0               | \$0         |
| A1120                                | Final Power Plant Startup           | Not Started     | \$0                | \$0               | \$0         |
| Subtotal                             |                                     |                 | \$0                | \$0               | \$0         |
| <b>Engineering</b>                   |                                     |                 |                    |                   |             |
| CPP.2                                | <b>Basic Engineering</b>            |                 |                    |                   |             |
| CPP.2.5                              | <b>Basic Engineering</b>            |                 |                    |                   |             |
| A1010                                | Basic Design Completion             | Completed       | \$0                | \$960             | \$960       |
| A1050                                | Basic Desing Revw                   | Completed       | \$0                | \$224             | \$224       |
| Subtotal                             |                                     |                 | \$0                | \$1,184           | \$1,184     |
| CPP.2.6                              | <b>Detail Engineering</b>           |                 |                    |                   |             |
| CPP.2.6.2                            | <b>Civil</b>                        |                 |                    |                   |             |



Project Start 01-Jul-16  
Project Finish 22-Dec-17  
Data Date 01-Jul-16

| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| \$0                  | \$0                  | \$0                         | \$0                    |
| <b>\$0</b>           | <b>\$0</b>           | <b>\$0</b>                  | <b>\$0</b>             |
| \$960                | \$0                  | \$960                       | \$0                    |
| \$224                | \$0                  | \$224                       | \$0                    |
| <b>\$1,184</b>       | <b>\$0</b>           | <b>\$1,184</b>              | <b>\$0</b>             |

AC-01 Activity Earned Value

| Activity ID |       | Activity Name                       | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|-------------|-------|-------------------------------------|-----------------|--------------------|-------------------|-------------|
|             | A1130 | Civil Detail Design Completion      | Completed       | \$0                | \$960             | \$960       |
|             | A1520 | Civil Detail Design Review          | Completed       | \$0                | \$224             | \$224       |
| Subtotal    |       |                                     |                 | \$0                | \$1,184           | \$1,184     |
| CPP.2.6.1   |       | Mechanical                          |                 |                    |                   |             |
|             | A1140 | Mechanical Detail Design Completion | Completed       | \$0                | \$960             | \$960       |
|             | A1530 | Mechanical Detail Design Review     | Completed       | \$0                | \$224             | \$224       |
| Subtotal    |       |                                     |                 | \$0                | \$1,184           | \$1,184     |
| CPP.2.6.7   |       | Electrical                          |                 |                    |                   |             |
|             | A1150 | Electrical Detail Design Completion | In Progress     | \$0                | \$0               | \$0         |
|             | A1540 | Electrical Detail Design Review     | Completed       | \$0                | \$224             | \$224       |
| Subtotal    |       |                                     |                 | \$0                | \$224             | \$224       |
| CPP.2.6.8   |       | Instrumentation & Control           |                 |                    |                   |             |
|             | A1160 | Control System Detail Design        | Completed       | \$0                | \$960             | \$960       |
|             | A1550 | Review                              | Completed       | \$0                | \$224             | \$224       |
| Subtotal    |       |                                     |                 | \$0                | \$1,184           | \$1,184     |
| Subtotal    |       |                                     |                 | \$0                | \$3,776           | \$3,776     |



100 MW Coal Fired Power Plant  
Report Date 10-Jun-17 00:25

Project Start 01-Jul-16  
Project Finish 22-Dec-17  
Data Date 01-Jul-16

| Budget At<br>Completion | Estimate To<br>Complete | Estimate At<br>Completion<br>Cost | Variance At<br>Completion |
|-------------------------|-------------------------|-----------------------------------|---------------------------|
| \$960                   | \$0                     | \$960                             | \$0                       |
| \$224                   | \$0                     | \$224                             | \$0                       |
| \$1,184                 | \$0                     | \$1,184                           | \$0                       |
| \$960                   | \$0                     | \$960                             | \$0                       |
| \$224                   | \$0                     | \$224                             | \$0                       |
| \$1,184                 | \$0                     | \$1,184                           | \$0                       |
| \$960                   | \$960                   | \$960                             | \$0                       |
| \$224                   | \$0                     | \$224                             | \$0                       |
| \$1,184                 | \$960                   | \$1,184                           | \$0                       |
| \$960                   | \$0                     | \$960                             | \$0                       |
| \$224                   | \$0                     | \$224                             | \$0                       |
| \$1,184                 | \$0                     | \$1,184                           | \$0                       |
| \$4,736                 | \$960                   | \$4,736                           | \$0                       |

AC-01 Activity Earned Value

| Activity ID |             | Activity Name                      | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|-------------|-------------|------------------------------------|-----------------|--------------------|-------------------|-------------|
| Subtotal    |             |                                    |                 | \$0                | \$4,960           | \$4,960     |
| CPP.3       | Procurement |                                    |                 |                    |                   |             |
| CPP.3.1     | Civil       |                                    |                 |                    |                   |             |
| A1020       |             | Civil Contractor Finalization      | In Progress     | \$0                | \$1,600,000       | \$120       |
| Subtotal    |             |                                    |                 | \$0                | \$1,600,000       | \$120       |
| CPP.3.4     | Mechanical  |                                    |                 |                    |                   |             |
| A1170       |             | Boiler, Fans & Auxalries           | Completed       | \$0                | \$2,703,840       | \$3,840     |
| A1180       |             | Turbine, Gear Box & Generator      | Not Started     | \$0                | \$0               | \$0         |
| A1190       |             | Balance of Plant (BOP) Mechancial  | Not Started     | \$0                | \$0               | \$0         |
| A1510       |             | Power Plant Design Purchasing      | Completed       | \$0                | \$100,480         | \$480       |
| A1590       |             | Water Treatment Plant              | Completed       | \$0                | \$1,000,960       | \$960       |
| A1650       |             | Mechanical Contractor Finalization | In Progress     | \$0                | \$500,480         | \$480       |
| Subtotal    |             |                                    |                 | \$0                | \$4,305,760       | \$5,760     |
| CPP.3.3     | Electrical  |                                    |                 |                    |                   |             |
| A1500       |             | Balance of Plant (BOP) Electrical  | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |             |                                    |                 | \$0                | \$0               | \$0         |



| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$5,920              | \$960                | \$5,920                     | \$0                    |
| \$3,200,000          | \$120                | \$240                       | \$3,199,760            |
| \$3,200,000          | \$120                | \$240                       | \$3,199,760            |
| \$2,703,840          | \$0                  | \$3,840                     | \$2,700,000            |
| \$2,209,600          | \$2,209,600          | \$2,209,600                 | \$0                    |
| \$2,503,840          | \$2,503,840          | \$2,503,840                 | \$0                    |
| \$100,480            | \$0                  | \$480                       | \$100,000              |
| \$1,000,960          | \$0                  | \$960                       | \$1,000,000            |
| \$1,000,960          | \$480                | \$960                       | \$1,000,000            |
| \$3,519,680          | \$4,713,920          | \$4,719,680                 | \$4,800,000            |
| \$1,501,920          | \$1,501,920          | \$1,501,920                 | \$0                    |
| \$1,501,920          | \$1,501,920          | \$1,501,920                 | \$0                    |

AC-01 Activity Earned Value

| Activity ID |  | Activity Name                       | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|-------------|--|-------------------------------------|-----------------|--------------------|-------------------|-------------|
| CPP.3.2     |  | Instrument Control                  |                 |                    |                   |             |
| A1220       |  | DCS System                          | Not Started     | \$0                | \$0               | \$0         |
| A1230       |  | Instrumentation                     | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |  |                                     |                 | \$0                | \$0               | \$0         |
| Subtotal    |  |                                     |                 | \$0                | \$5,905,760       | \$5,880     |
| CPP.4       |  | Construction                        |                 |                    |                   |             |
| CPP.4.1     |  | Civil Work                          |                 |                    |                   |             |
| A1240       |  | Boiler Foundations & Building       | Not Started     | \$0                | \$0               | \$0         |
| A1250       |  | Turbine Foundations & Building      | Not Started     | \$0                | \$0               | \$0         |
| A1260       |  | Balance of Plant (BOP) Foundations  | Not Started     | \$0                | \$0               | \$0         |
| A1450       |  | Bag Filters Foundations             | Not Started     | \$0                | \$0               | \$0         |
| A1460       |  | FGD Foundation                      | Not Started     | \$0                | \$0               | \$0         |
| A1470       |  | Cooling Towers Civil Work           | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |  |                                     |                 | \$0                | \$0               | \$0         |
| CPP.4.2     |  | Mechanical Work                     |                 |                    |                   |             |
| A1270       |  | Boiler Steel Structure installation | Not Started     | \$0                | \$0               | \$0         |
| A1280       |  | Fans Installation                   | Not Started     | \$0                | \$0               | \$0         |



| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$1,000,000          | \$1,000,000          | \$1,000,000                 | \$0                    |
| \$500,000            | \$500,000            | \$500,000                   | \$0                    |
| \$1,500,000          | \$1,500,000          | \$1,500,000                 | \$0                    |
| \$15,721,600         | \$7,715,960          | \$7,721,840                 | \$7,999,760            |
| \$3,840              | \$3,840              | \$3,840                     | \$0                    |
| \$3,840              | \$3,840              | \$3,840                     | \$0                    |
| \$3,840              | \$3,840              | \$3,840                     | \$0                    |
| \$960                | \$960                | \$960                       | \$0                    |
| \$320                | \$320                | \$320                       | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$14,240             | \$14,240             | \$14,240                    | \$0                    |
| \$1,920              | \$1,920              | \$1,920                     | \$0                    |
| \$640                | \$640                | \$640                       | \$0                    |

AC-01 Activity Earned Value

IS

Activity ID

Activity Name

Activity  
Status

Planned  
Value Cost

Earned Value  
Cost

Actual Cost

|          |                                            |             |     |     |     |
|----------|--------------------------------------------|-------------|-----|-----|-----|
| A1290    | Pipe lines installation                    | Not Started | \$0 | \$0 | \$0 |
| A1300    | Turbine, Gear Box & Generator Installation | Not Started | \$0 | \$0 | \$0 |
| A1310    | Balance of Plant (BOP) Installation        | Not Started | \$0 | \$0 | \$0 |
| A1410    | Boiler Pressure part Installation          | Not Started | \$0 | \$0 | \$0 |
| A1420    | Boiler Drum Installation                   | Not Started | \$0 | \$0 | \$0 |
| A1430    | Bag Filters Installation                   | Not Started | \$0 | \$0 | \$0 |
| A1440    | FGD Installation                           | Not Started | \$0 | \$0 | \$0 |
| A1480    | Cooling Towers Installation                | Not Started | \$0 | \$0 | \$0 |
| A1560    | Conveyors Installation                     | Not Started | \$0 | \$0 | \$0 |
| A1570    | Water Treatment Plant Installation         | Not Started | \$0 | \$0 | \$0 |
| A1580    | Water Tanks Installation                   | Not Started | \$0 | \$0 | \$0 |
| A1600    | Ducts Installation                         | Not Started | \$0 | \$0 | \$0 |
| A1610    | Bottom Ash Silo Fabrication & Installation | Not Started | \$0 | \$0 | \$0 |
| A1620    | Fly Ash Silo Fabrication & Installation    | Not Started | \$0 | \$0 | \$0 |
| A1630    | Limestone Silo Fabrication & Installation  | Not Started | \$0 | \$0 | \$0 |
| A1640    | Boiler Hydraulic Test                      | Not Started | \$0 | \$0 | \$0 |
| Subtotal |                                            |             | \$0 | \$0 | \$0 |
| CPP.4.5  | Electrical Work                            |             |     |     |     |
| A1320    | VFD's & Pannel Installation                | Not Started | \$0 | \$0 | \$0 |



| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$1,920              | \$1,920              | \$1,920                     | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$2,880              | \$2,880              | \$2,880                     | \$0                    |
| \$224                | \$224                | \$224                       | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$960                | \$960                | \$960                       | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$960                | \$960                | \$960                       | \$0                    |
| \$960                | \$960                | \$960                       | \$0                    |
| \$640                | \$640                | \$640                       | \$0                    |
| \$960                | \$960                | \$960                       | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$1,440              | \$1,440              | \$1,440                     | \$0                    |
| \$224                | \$224                | \$224                       | \$0                    |
| \$22,368             | \$22,368             | \$22,368                    | \$0                    |
| \$320                | \$320                | \$320                       | \$0                    |

AC-01 Activity Earned Value

| Activity ID | Activity Name                        | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|-------------|--------------------------------------|-----------------|--------------------|-------------------|-------------|
| A1330       | Cable Laying                         | Not Started     | \$0                | \$0               | \$0         |
| A1490       | Transformer Installation             | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |                                      |                 | \$0                | \$0               | \$0         |
| CPP.4.4     | Instrument & Control Work            |                 |                    |                   |             |
| A1340       | DCS installation                     | Not Started     | \$0                | \$0               | \$0         |
| A1350       | Debugging                            | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |                                      |                 | \$0                | \$0               | \$0         |
| Subtotal    |                                      |                 | \$0                | \$0               | \$0         |
| CPP.5       | Commissioning                        |                 |                    |                   |             |
| A1360       | Boiler Commissioning                 | Not Started     | \$0                | \$0               | \$0         |
| A1370       | Turbine Commissioning                | Not Started     | \$0                | \$0               | \$0         |
| A1380       | Boiler, Turbine, BOP Integration     | Not Started     | \$0                | \$0               | \$0         |
| A1390       | Balance of Plant (BOP) Commissioning | Not Started     | \$0                | \$0               | \$0         |
| A1400       | Power Plant Startup                  | Not Started     | \$0                | \$0               | \$0         |
| Subtotal    |                                      |                 | \$0                | \$0               | \$0         |
| Subtotal    |                                      |                 | \$0                | \$5,910,720       | \$10,840    |



| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$32                 | \$32                 | \$32                        | \$0                    |
| \$32                 | \$32                 | \$32                        | \$0                    |
| \$384                | \$384                | \$384                       | \$0                    |
| \$640                | \$640                | \$640                       | \$0                    |
| \$640                | \$640                | \$640                       | \$0                    |
| \$1,280              | \$1,280              | \$1,280                     | \$0                    |
| \$38,272             | \$38,272             | \$38,272                    | \$0                    |
| \$1,600              | \$1,600              | \$1,600                     | \$0                    |
| \$1,600              | \$1,600              | \$1,600                     | \$0                    |
| \$1,600              | \$1,600              | \$1,600                     | \$0                    |
| \$1,600              | \$1,600              | \$1,600                     | \$0                    |
| \$3,200              | \$3,200              | \$3,200                     | \$0                    |
| \$9,600              | \$9,600              | \$9,600                     | \$0                    |
| \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |

AC-01 Activity Earned Value

| IBS         |               |                 |                    |                   |             |
|-------------|---------------|-----------------|--------------------|-------------------|-------------|
| Activity ID | Activity Name | Activity Status | Planned Value Cost | Earned Value Cost | Actual Cost |
|             |               |                 |                    |                   |             |
| Subtotal    |               |                 | \$0                | \$5,910,720       | \$10,840    |
|             |               |                 |                    |                   |             |
| Subtotal    |               |                 | \$0                | \$5,910,720       | \$10,840    |
|             |               |                 |                    |                   |             |
| Total       |               |                 | \$0                | \$5,910,720       | \$10,840    |



| Budget At Completion | Estimate To Complete | Estimate At Completion Cost | Variance At Completion |
|----------------------|----------------------|-----------------------------|------------------------|
| \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |
| \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |
| \$15,775,392         | \$7,764,792          | \$7,775,632                 | \$7,999,760            |

**17 LOG FOR CBT REPORT & PRIMAVERA LEARNING**

| <b>Log for CBT Report &amp; Primavera Learning</b> |                       |                                                                             |                                                                                      |
|----------------------------------------------------|-----------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>SR#</b>                                         | <b>Activity</b>       | <b>Problem</b>                                                              | <b>Remedy</b>                                                                        |
| 1                                                  | OBS                   | What is OBS & How can we create it?                                         | Organization breakdown structure and we can create it just like EPS.                 |
| 2                                                  | Sequence Activities   | Why activities are not as per sequence?                                     | Activity ID must be as per sequence                                                  |
| 3                                                  | Budgeted Cost         | Why Budgeted Cost is not as per calculations                                | There was a mistake in unit time setting                                             |
| 4                                                  | Calendar              | If select Calendar for project, then it must be selected for all activities |                                                                                      |
| 5                                                  | Resources             | How can we put the cost for Non Labor Resource                              | Directly in Budgeted material cost.                                                  |
| 6                                                  | Earned Value Analysis | How can we perform earned value analysis in Primavera                       | In Tracking, We can select Earned Value and related all parameters will be displayed |
| 7                                                  | Baseline              | How can we maintain the Baseline?                                           | First establish baseline and then assign to the project                              |
| 8                                                  | Spending Plan         | How can we add spending plan                                                | In project detail, we can add spending plan                                          |
| 9                                                  | Project Status        | How can we update status in Primavera P-6?                                  | Simply from Activity Details                                                         |
| 10                                                 | Resource Roles        | What is resource roles                                                      | We can manage resources by their roles                                               |



**18 REFERENCES LIST**

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19 Plagiarism Report

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