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Masco Energy Services- 2MW Diesel Generator Installation Project (Implementation in Primavera)

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SEMESTER: Fall-2015, MSPM - III

PROGRAM: MS (PROJECT MANAGEMENT)



BAHRIA UNIVERSITY LAHORE CAMPUS

SUBMITTED TO: Mr. Muhammad Faisal Shahzad

SUBMISSION DATE: 17-Jan-2016

CERTIFICATE

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

It is witnessed that Mr. Mahmood Ahmad Enrollment: 03-298142-045 and Mr. Nabeel Khalid Enrollment: 03-298142-27, Class: **MSPM-III**, Semester: **Fall 2015** have participated in our real-time projects for implementing project management skills using Primavera P6 as a leading software tool.

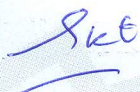
They have contributed fully in the following project and within the highlighted fields (planning, scheduling, earned value analysis, performance monitoring, and report generation):

1. 2MW DG Set Installation

They have been found skillful in applying Primavera P6 in the following highlighted fields (planning, scheduling, earned value analysis, performance monitoring, and report generation).

Additionally, it is noteworthy to mention that Mr. Mahmood Ahmad and Mr. Nabeel Khalid demonstrated good ethical practices, enthusiastic approach to work, task convergence capabilities, professionalism while they stay with this organization.

For Masco Energy Services:



Mr. Shaukat Sadozai

Verified By Trainer:

Mr. M Faisal Shahzad

For the Reader

The report is about implementation of EPM in Primavera at MES, an organization deals with supply, installation and commissioning, sales and services and occupies a driving position in the respective arena. It provides a practical insight of the software vis-à-vis project management for better managing power sector projects.

The credit goes to our families, peers and teachers for their utmost support and guidance in pursuing and achieving our goals and ends.

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Section 1- Introduction of MASCO

1.1 Brief History of Masco

Masco Energy Services has been forerunner in advanced power systems since the last 44 years and providing assistance to local industries thrive in the face of energy crises faced by the country. Masco is at the helm of creating innovative solutions for power generation necessities of its clients.

The company has its head office in Karachi and a regional office in Lahore. It has two satellite facilities in Islamabad and Hyderabad. In addition to Pakistan the company is providing its services to customers in Middle East and Africa.



Masco Energy Services (Pvt) Ltd

1.2 Introduction

We have a wide range of products for residential, commercial and industrial applications backed by our premium long-term service support. Our field of expertise are as follow.

- **Renewable Energy**
- **Diesel & Gas Engines/Generators**
- **Construction & Earth Moving Equipment**
- **Reciprocating Gas Compressors**

1.3 Major Products

Masco is specialized in providing diesel and gas power generating equipment ranging from 450kVA to 3000kVA (Industrial & Commercial Applications) and representing world famous power generators producers in Pakistan. MASCO also has biggest post sale services and granary network countywide at large.

1.4 International Partners



1.5 Services

MASCO offers following services by expert and internationally qualified engineers;

- Load Analysis
- Installation
- Commissioning
- Synchronization & Load sharing (internal / subcontracting)
- Post-sale services
- Major and minor refurbishing (internal / subcontracting)
- Yearly maintenance agreements
- And other related works of power production industry
- Service contract
- Rent Generator Set
- Switchgear Manufacture (subcontracting)
- Fuel system fitting (subcontracting)
- Turnkey solutions (internal / subcontracting)
- Online observing and regulatory of fuel (internal / subcontracting)
- Diesel Lab
- Machining work (internal)
- Power House fabrication and Civil Work (internal / subcontracting)
- Radiator Ducts, Canopies Fabrications (internal/ subcontracting)

1.6 Customer Base

MASCO distinguishes itself in the competition by dispensing exceptional services, innovation and industry through management, supervision and customer care. MASCO has more than 2,000 pleasing customers comprising domestic and international companies and organization including the UN, Pepsi, CMPAK GSM, CAA Lahore, Total Pakistan, Bank Al-Habib, Pak Army and numerous others.

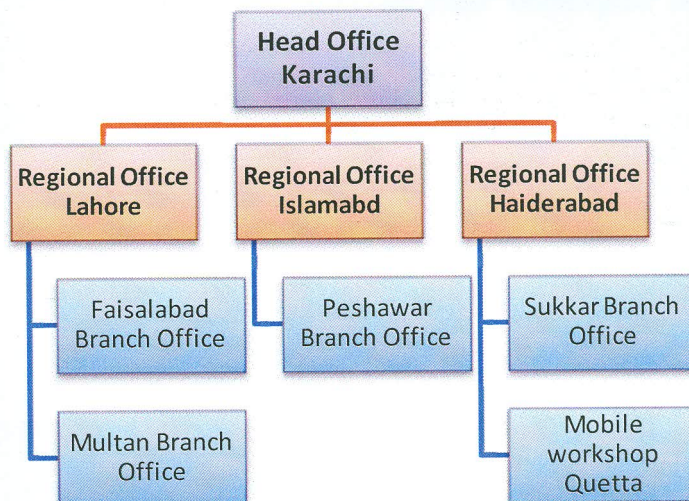
1.7 Company's Strengths

- 300 permanent Personnel
- 20 PEC Certified Engineer of related technologies.
- 6 state of the art yards countrywide
- 4 ware-houses having large parts storage facility
- Major post sale services linkage in Pakistan
- 24/7 on call SOS services

1.8 Organization Culture

There are 3 departments. Operations department is responsible for taking care of routine work on site after installation. Service department is available in case there is a need of repair or overhauling. Sales department is responsible for bringing new projects by competing in the market.

1.9 Company Network



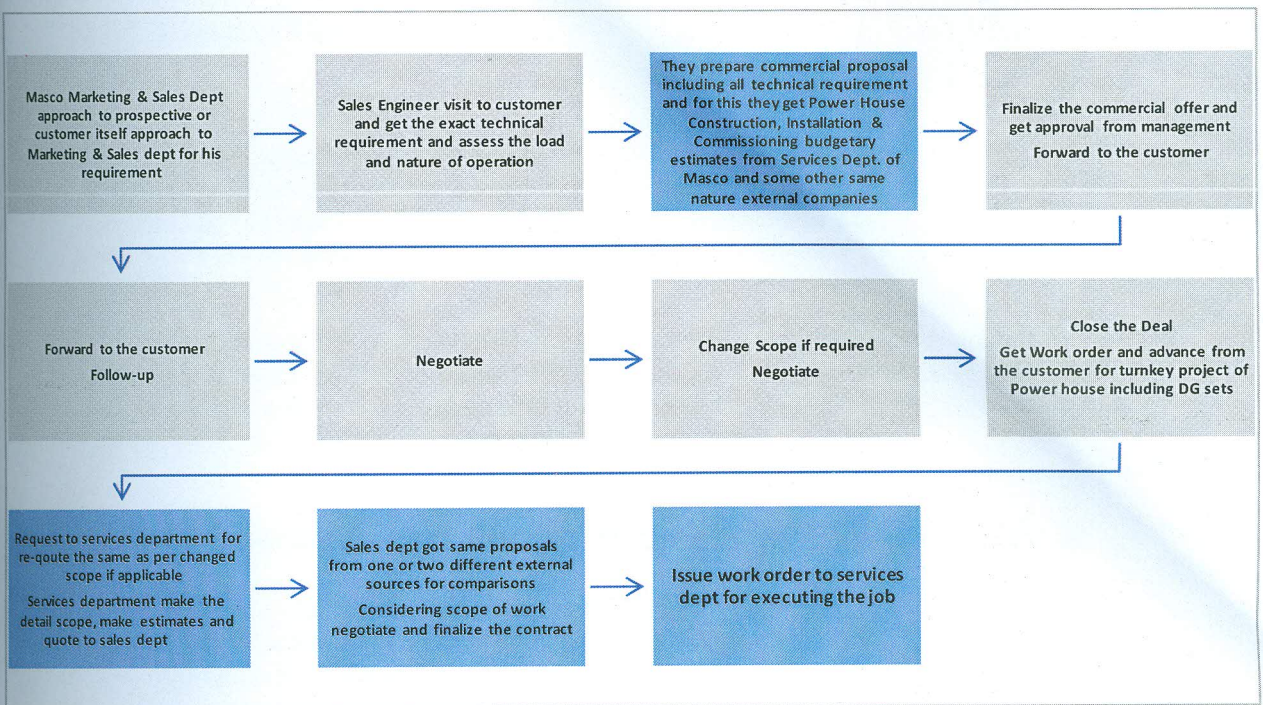
(Figure 1 Company Network)

1.10 Organization Hierarchy

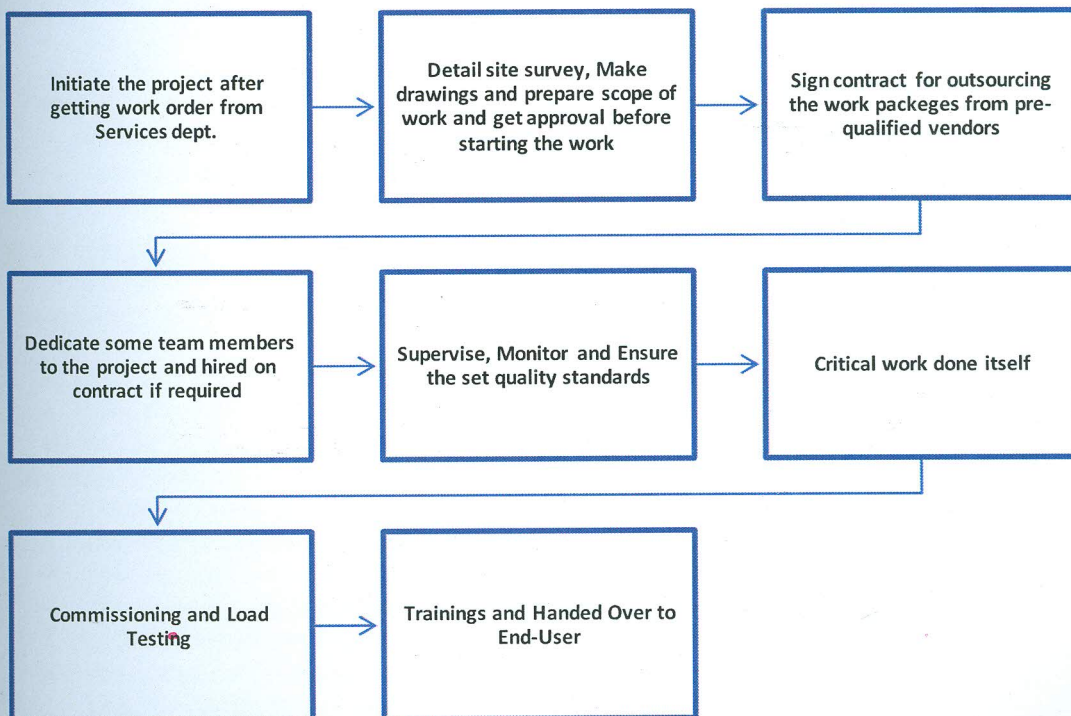


1.11 MASCO Project Procedures - Sales Department

Discussing sales department in point, when the deal is closed and the customer places the order then the project is transferred to the service department further that department makes approximations and formulates proposal after negotiations



1.12 Services Department Way of working



1.13 Project Team Set-up

Service department does not have project management expertise for installation and commissioning of project on turnkey basis. Regional Services manager assigns the responsibility of project to the deputy manager if it values Less than 10 million PKR and the regional manager take up the project if it is over 10 Million PKR and act as a project manager.

The PM has the responsibility of initiating and closing the project and keep regional managers services or GM services informed and get guidance if required also keeping in loop to sales department and keep end user informed of the status. Regional manager and Deputy Manager has more than one projects in their domain at a time.

1.14 Problems faced during Projects in Existing set-up

- At times actual cost exceeds the estimated
- owing to external or internal issues project delays
- Scope gets changed
- Outsourced work performs below quality
- HR management difficulties
- Critical Decision making issues
- Mismanagement of the resources
- Poor Communication
- Documentation issues
- Noncompliance baselines
- Vendor's unfulfilled commitments
- Payments delays
- poor communication between sales and services responsibilities
- customer unacceptance

1.15 Our Observations

We observe the following reasons caused for problems in projects:

- cushions in estimates or old estimates cause cost variations
- delayed decisions of vendor causes delay in schedule
- scope creep or unapproved scope change
- poor quality control on outsourced products
- customer feedback can be collected using project team deployed on site
- project management knowledge increase decision making
- poor transportation destroys or damages the tools and equipment
- managing stakeholder needs a comprehensive communication plan
- poor or less documentation creates problem of finding issues
- risk management is only in letter or text
- there is no plan for escalation of updated information
- Quality assurance or process improvement is not done at all
- sales department overcommits and gives unrealistic timelines

Section 2 – Enterprise Project Management (EPM) in MASCO

2.1 Defining Business Drivers

The following are the business drivers of Masco

- Advancement in industrial sector
- Progress in public sector
- Growth in commercial sector
- Reduce electricity supply and demand gap
- Increased cash flows

2.2 Project Selection Criteria

An MASCO project criterion depends on following:

- Profit margins
- Availability of team and expertise
- Realistic project timeline
- Value of customer

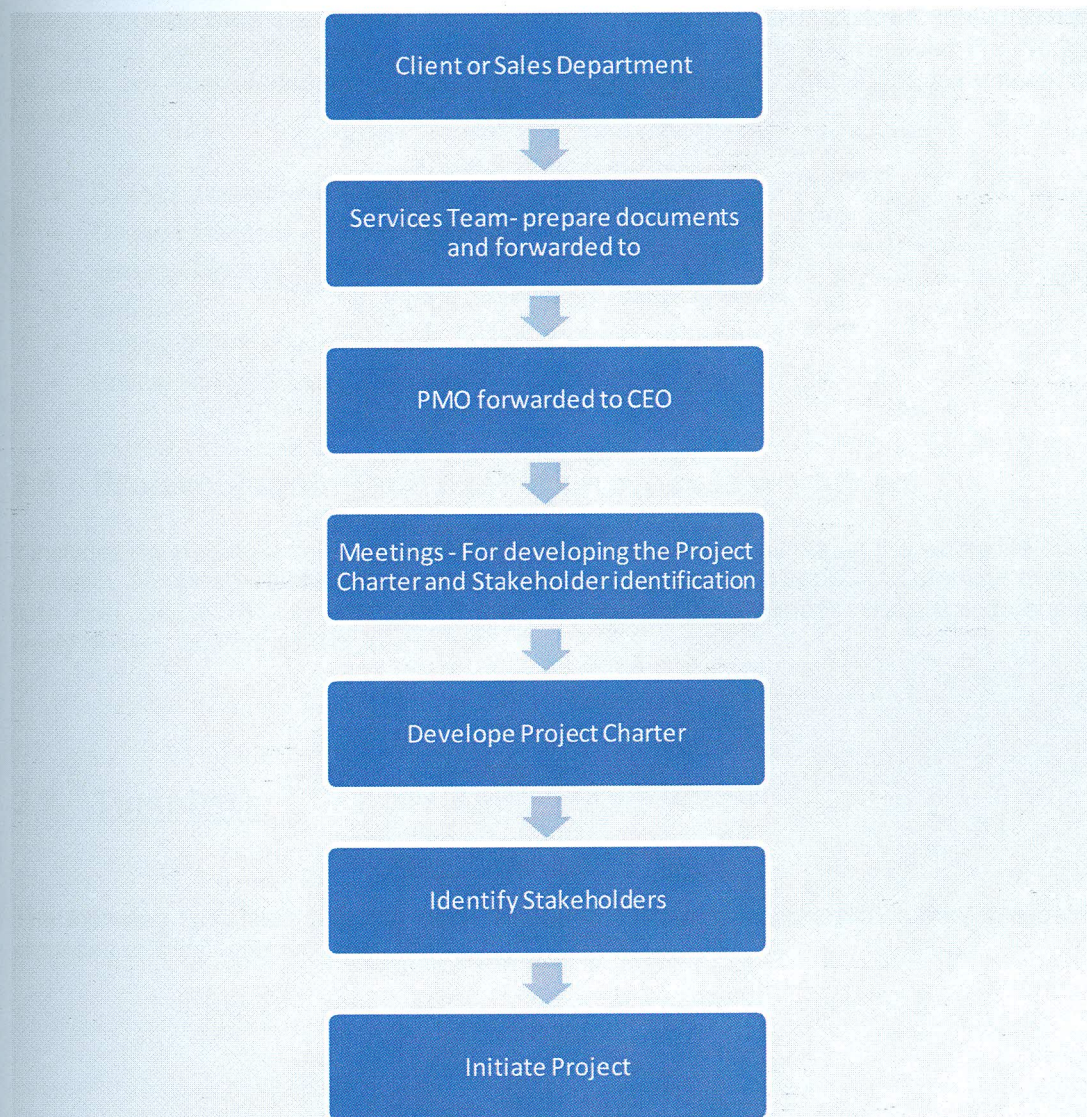
2.3 Order of Project Prioritization

The following order has been prescribed:

- Already existing clients
- Industrial sector projects
- Commercial sector projects
- Telecommunication Industry Projects
- Government sector Projects
- Other related Projects

2.4 Project Initiation—Work flow diagram

The goals and objectives are set in this particular process. It plays dynamic and important role in a project if it is started appropriately then there are a lot of indecisions during the entire project. Therefore, the initiation is a vital process group. There is a need to formulate project charter clearly and precisely. The project initiation process is framed by the below work flow diagram.



(Figure 2.1: project initiation process—Workflow diagram)

2.5 Integrated Change Control Board

The implementation or rejection is dependent on the decision of the ICCB on the basis of change requests being processed. These changes can be internal or external. It has ultimate authority for handling the change requests. The PMO through the PM receives the change requests and then it debated in ICCB for advance decisions. And ICCB comprises the following:

- Director department concerned.
- General Manager Sales & Services
- General Manager Finance
- End-User
- Project Management Office
- Critical Stakeholders

2.6 Project planning and execution process workflows

It includes developing a set of plans that are used and followed by during the whole life cycle of project. All plans established throughout the planning phase to support to manage mainly, time, cost, quality, HR, and changes. It also manage the procurement versus time to ensure timely delivery and completion of project.

2.7 Templates:

The following templates has not been in use of the organization, rather they are being proposed at initial level.

2.7.1 Project Charter Templates

Project Charter	
Project Name:	Date:
Project ID:	
1. Project Introduction / Description / Brief Note	
1.1. Purpose of Project	
1.2. Project Overview	
1.3. Business Need	
2. Scope	
2.1. Objectives	
2.2. High Level Requirements	
2.3. Major Deliverables	
2.4. Boundaries	
3. Timelines	
3.1. Project Duration	
3.2. Executive Milestones	
4. Budget	
4.1. Sponsor detail	
4.2. Estimates	
4.3. Constraints	
4.4. Risk and Contingency Amounts	
5. Team Composition	
6. Project Organization	
6.1. Roles & Responsibility	
6.2. Identify Stakeholder	
7. Signatures	

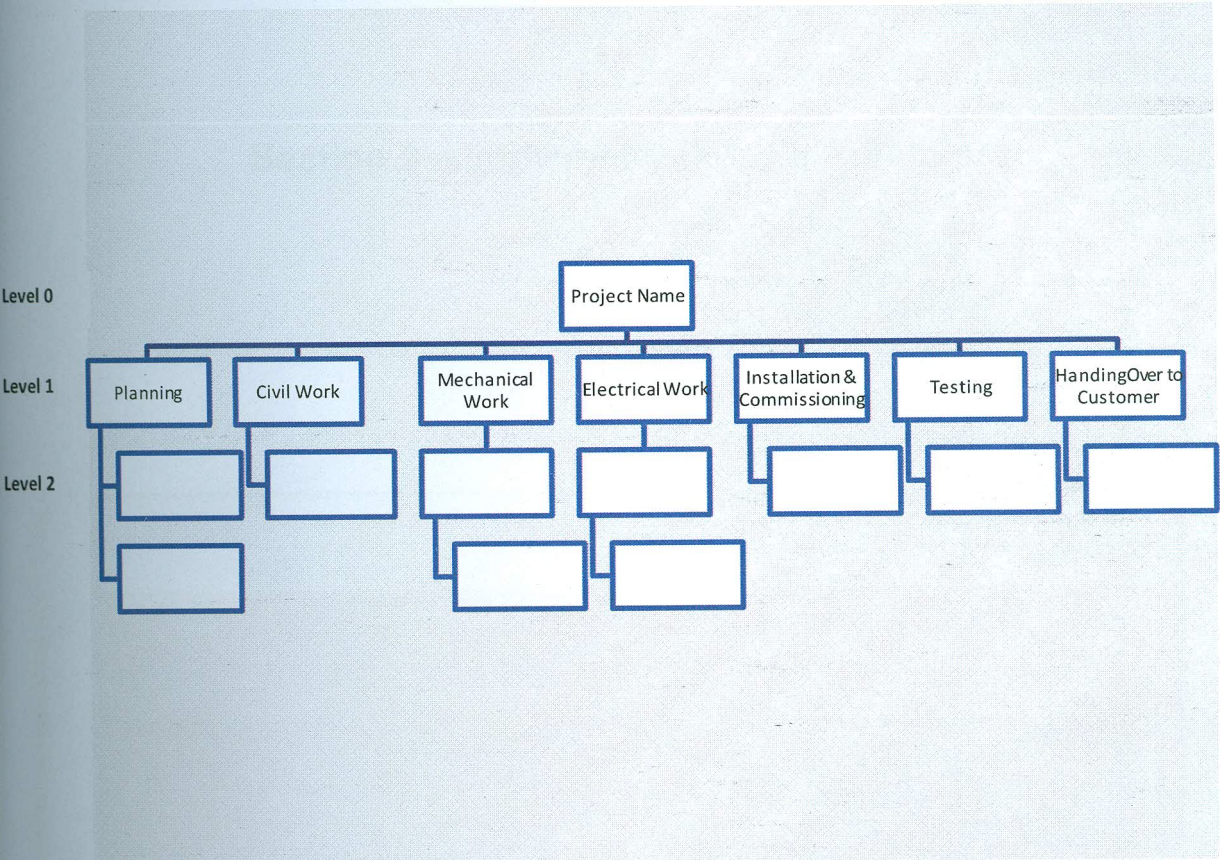
(Figure 2.2- Project Charter template)

2.7.2 Scope Statement Template for MASCO

Project Scope Statement	
Project Name:	Date:
Project ID:	
1. State the Project Scope	
2. Mission	
3. Objectives	
4. Boundaries	
5. High Level Goals	
6. Signatures	

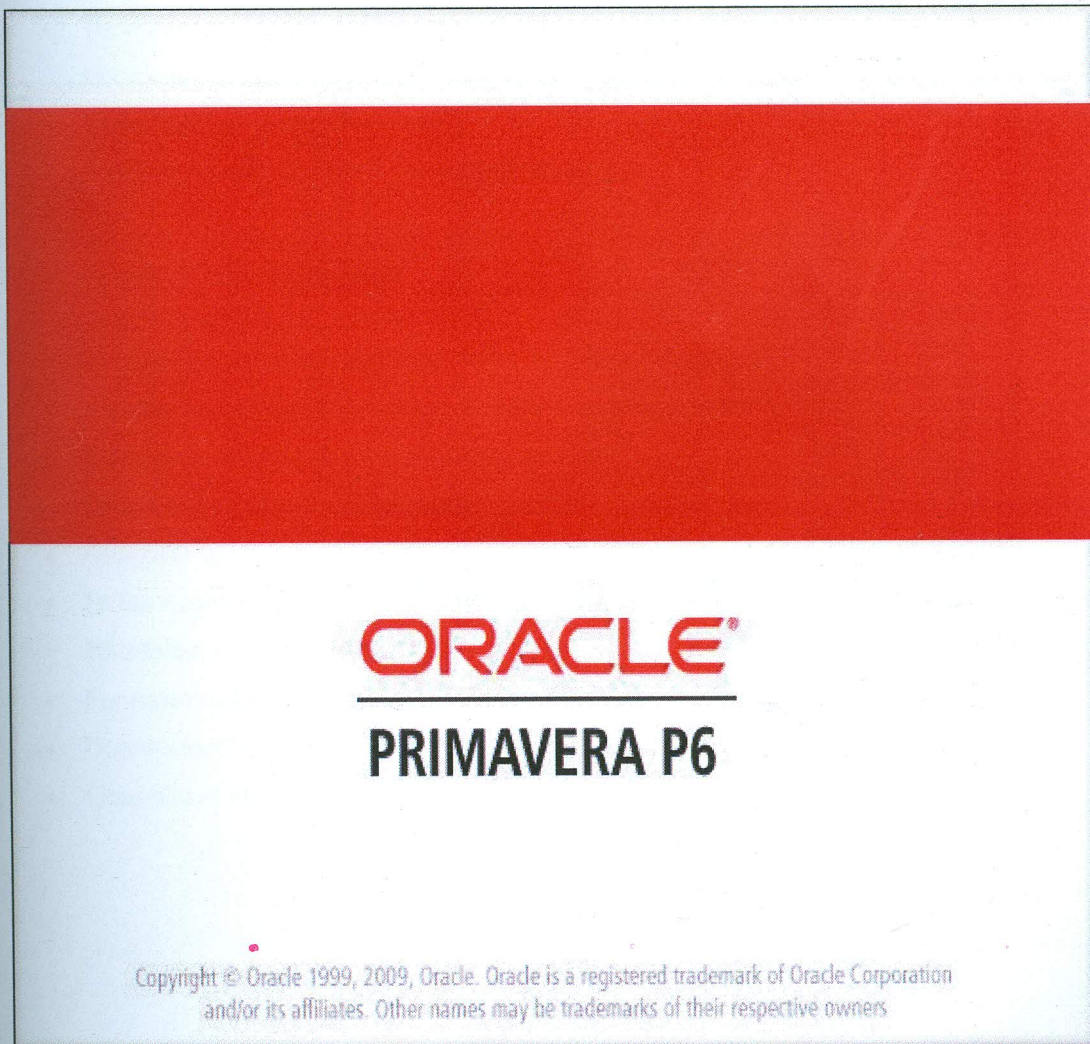
(Figure 2.3- Project Scope Statement Template)

2.7.3 WBS Template for MASCO



(Figure 2.4- Project WBS Template)

Section 3 – Implementation P6 Primavera



Installation & commissioning of 2MW Diesel Generator as Industrial power Plant

3.1 Selection of Project and Documents

3.1.1 Project Business Driver

- Progress in Industrial Sector

3.1.2 Project Charter

- To make available the redundant (back-up) power supply for the plant during electricity outages.
- To be used as a standby source
- Procure the Gen-set from a reputable dealers.

3.1.3 Project Scope Statement

- Construction of power house building and Grounding pad
- Installation and commissioning of 2MW Diesel Generator
- Synch with Wapda and load-sharing options
- Masco will provide the Switchgear
- Canopies will be sound proof
- Fit the Front-end fuel tank
- Installation of Radiator ducting
- For noise reduction silencer will fitted
- Dummy load testing for 24 Hours
- Operational staff will be trained by Masco

3.2 Structuring Data in P6

3.2.1 Setup EPS of Masco in P6

It is defined first as it tells about the company wise projects. The organization may have one or more sectors and further projects in each sector. Masco has different sectors like energy production by fossil fuels mainly diesel, then the new one is Solar Power Generation. Other sector is related to heavy machinery.

3.2.2 Setup OBS in P6

It is the hierarchy of individuals in an organization. Masco has its CEO then Director of each sector. DG power productions projects are handles by Director Technical Services.

3.2.3 Setup Resources in P6

- Electrical engineer
- Commissioning Engineer
- Fitter Mechanics
- Technical Electrician
- Technical Mechanical
- Senior fabricator
- Mechanical Engineer

3.2.4 Setup Roles and WBS in P6

The above mentioned resources are assigned to activities in the WBS. Each resource has its expertise and experience.

- 1.1 Planning
- 1.2 Placement and Erection
- 1.3 Installation and Fabrication
- 1.4 Commissioning and Testing
- 1.5 Handing Over

3.2.5 Defining Activities and Linkages in P6

Activities under each work package are defined and scheduled. There were several technical activities in the project and majority of them were **task dependent** and percentage completion was physical type. There were two activities that were used as **milestones**, start and finish Milestones

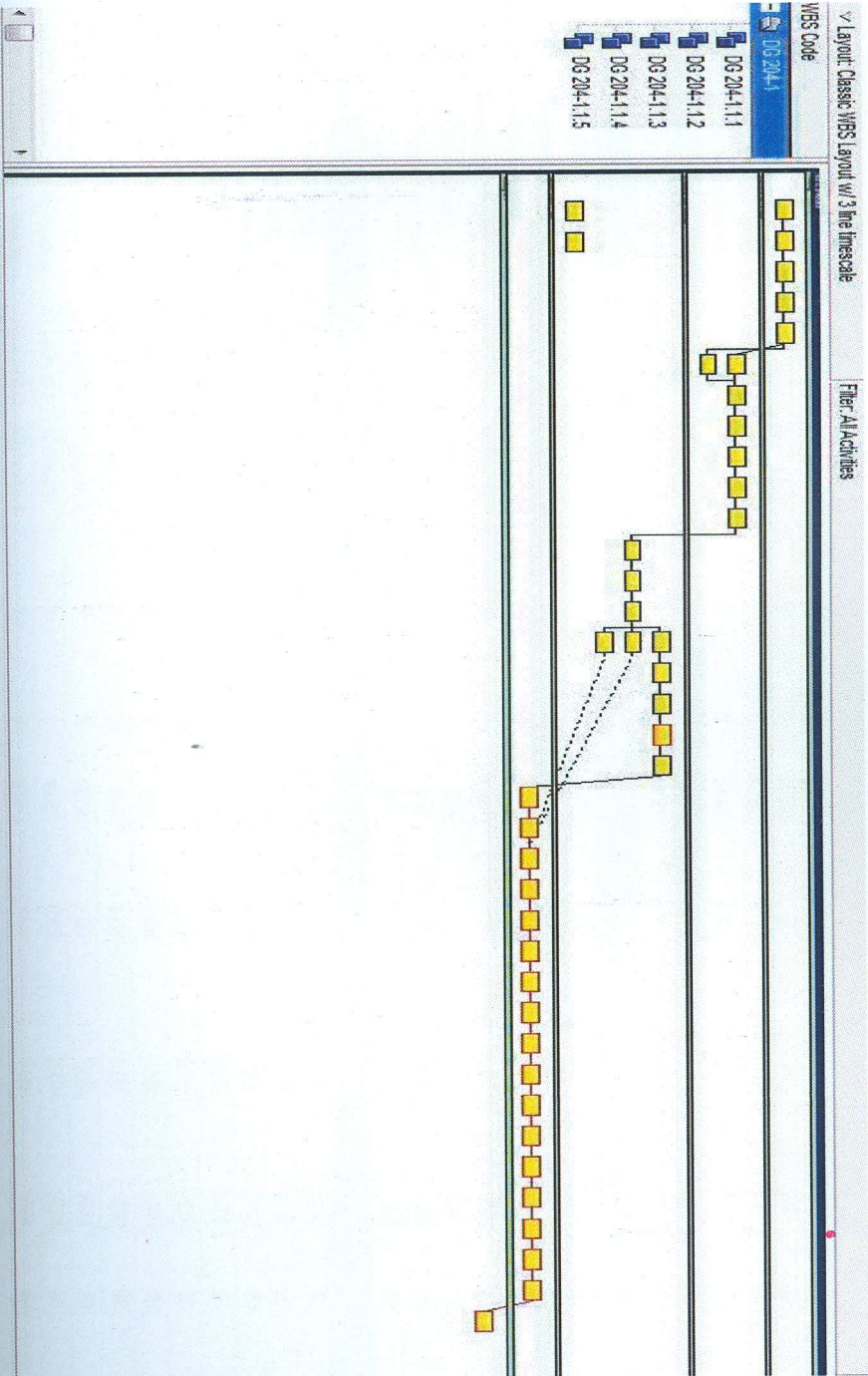
3.2.6 Maintain and Assign Baseline

We can make as many baselines as needed contrary to the limitations in MS office of 11 baselines. Baseline we used to compare with actual work performed. Hence we generated reports. **Assign baseline** is used to just assign and use for comparison.

3.2.6 Schedule and Actual Progress

Actual progress is updated to indicate actual work performed. And Schedule the project tells the point in time for status of project.

3.3 Project Network Diagram



3.4 Project Activities (Time and Cost estimates and status)

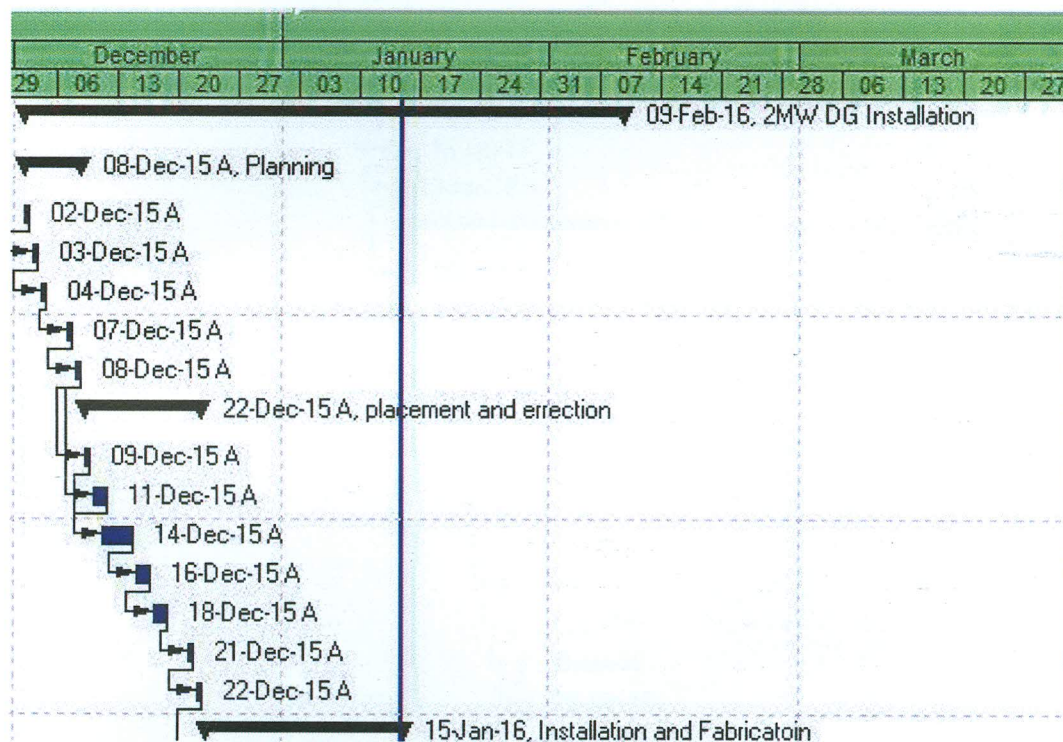
Layout: Classic WBS Layout w/ 3 line timescale				Filter: All Activities							
Activity ID	Activity Name	Start	Finish	Original Duration	Remaining Duration	Actual Cost	Cost Performance Index	Schedule Performance Index	Budget At Completion	Estimate To Complete	Schedule % Complete
2MW DG Installation											
Planning		02-Dec-15 A	08-Dec-15 A	5	0	\$1,760	1.00	1.00	\$1,760	\$0	100%
A1000	Site survey	02-Dec-15 A	02-Dec-15 A	1	0	\$280	1.00	1.00	\$280	\$0	100%
A1010	HR planning	03-Dec-15 A	03-Dec-15 A	1	0	\$280	1.00	1.00	\$280	\$0	100%
A1020	Costing and budgeting	04-Dec-15 A	04-Dec-15 A	1	0	\$400	1.00	1.00	\$400	\$0	100%
A1030	Scheduling	07-Dec-15 A	07-Dec-15 A	1	0	\$400	1.00	1.00	\$400	\$0	100%
A1040	Review and plan finalised	08-Dec-15 A	08-Dec-15 A	1	0	\$400	1.00	1.00	\$400	\$0	100%
Placement and erection		09-Dec-15 A	22-Dec-15 A	10	0	\$1,160	1.00	1.00	\$1,160	\$0	100%
A1050	Unloading from container	09-Dec-15 A	09-Dec-15 A	1	0	\$120	1.00	1.00	\$120	\$0	100%
A1060	Placement on foundation pad	10-Dec-15 A	11-Dec-15 A	2	0	\$120	1.00	1.00	\$120	\$0	100%
A1070	Radiator Assembly	11-Dec-15 A	14-Dec-15 A	2	0	\$184	1.00	1.00	\$184	\$0	100%
A1080	Generator Anchoring	15-Dec-15 A	16-Dec-15 A	2	0	\$496	1.00	1.00	\$496	\$0	100%
A1090	Radiator Anchoring	17-Dec-15 A	18-Dec-15 A	2	0	\$80	1.00	1.00	\$80	\$0	100%
A1100	Gen Pannel Anchoring	21-Dec-15 A	21-Dec-15 A	1	0	\$80	1.00	1.00	\$80	\$0	100%
A1110	Fuel Tank Fixing	22-Dec-15 A	22-Dec-15 A	1	0	\$80	1.00	1.00	\$80	\$0	100%
Installation and Fabrication		23-Dec-15 A	15-Jan-16	16	0	\$2,152	0.83	0.83	\$2,152	\$0	100%
A1120	Power Cable Laying	23-Dec-15 A	25-Dec-15 A	3	0	\$224	1.00	1.00	\$224	\$0	100%
A1130	Control Cable Laying	28-Dec-15 A	29-Dec-15 A	2	0	\$224	1.00	1.00	\$224	\$0	100%
A1140	Exhaust Pipe Fabrication	30-Dec-15 A	01-Jan-16 A	3	0	\$416	1.00	1.00	\$416	\$0	100%
A1150	Battery Rack Fabrication and	04-Jan-16 A	15-Jan-16	2	0	\$400	0.50	0.50	\$400	\$0	100%
A1160	Water Separator	06-Jan-16 A	15-Jan-16	1	0	\$56	0.33	0.33	\$56	\$0	100%
A1170	Fuel Pipe Connections	07-Jan-16 A	07-Jan-16 A	1	0	\$80	1.00	1.00	\$80	\$0	100%
A1180	Exhaust Pipe Fixing	08-Jan-16 A	08-Jan-16 A	1	0	\$80	1.00	1.00	\$80	\$0	100%
A1190	Power Cable Testing	11-Jan-16 A	11-Jan-16 A	1	0	\$224	1.00	1.00	\$224	\$0	100%
A1200	Power Cable Termination	12-Jan-16 A	15-Jan-16	1	0	\$224	0.40	0.40	\$224	\$0	100%
A1210	Control Cable Termination	13-Jan-16 A	13-Jan-16 A	1	0	\$224	1.00	1.00	\$224	\$0	100%

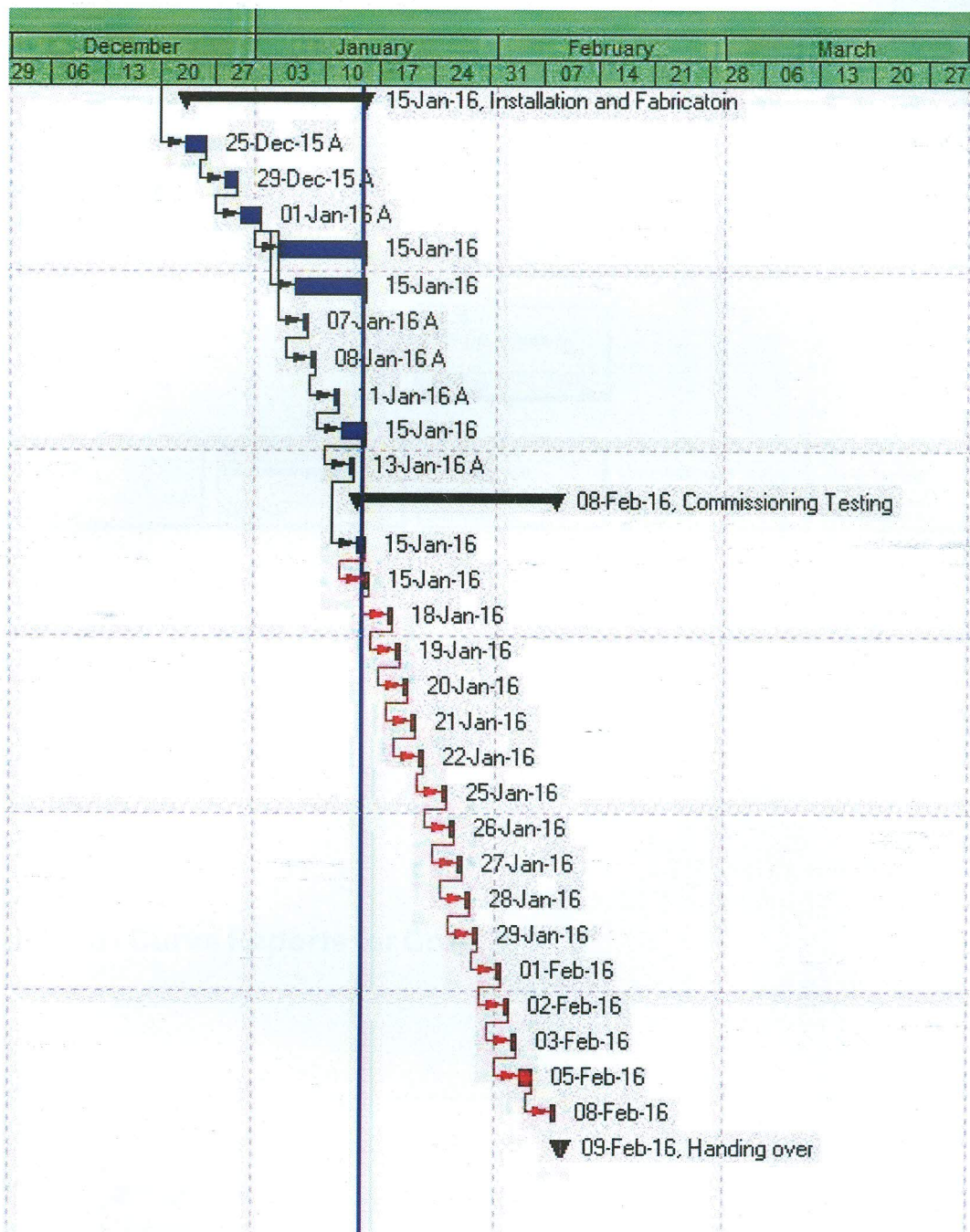
Layout: Classic WBS Layout w/ 3 line timescale

Filter: All Activities

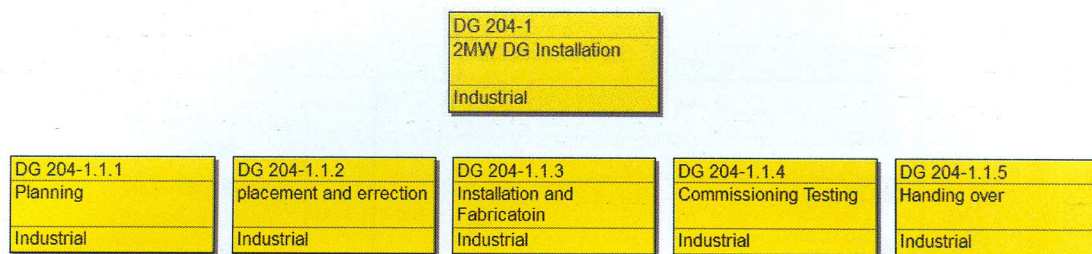
Activity ID	Activity Name	Start	Finish	Original Duration	Remaining Duration	Actual Cost	Cost Performance Index	Schedule Performance Index	Budget At Completion	Estimate To Complete	Schedule % Complete
2MW DG Installation											
+	Planning	02-Dec-15 A	08-Dec-15 A	5	0	\$1,760	1.00	1.00	\$1,760	\$0	100%
+	placement and erection	09-Dec-15 A	22-Dec-15 A	10	0	\$1,160	1.00	1.00	\$1,160	\$0	100%
+	Installation and Fabrication	23-Dec-15 A	15-Jan-16	16	0	\$2,152	0.83	0.83	\$2,152	\$0	100%
+	Commissioning Testing	14-Jan-16 A	08-Feb-16	18	17	\$120	0.00	0.00	\$3,160	\$3,040	3.8%
A1220	Fill Lube Oil	14-Jan-16 A	15-Jan-16	1	0	\$120	0.00	0.00	\$120	\$0	100%
A1230	Fill Coolant Chemical	15-Jan-16*	15-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1240	Fill Diesel	18-Jan-16	18-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1250	Check Battery Connections	19-Jan-16	19-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1260	Check Cable Connections	20-Jan-16	20-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1270	Check Exhaust Line	21-Jan-16	21-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1280	Check Breaker	22-Jan-16	22-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1290	Check Filters	25-Jan-16	25-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1300	Start Generator Without Load	26-Jan-16	26-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1310	No Load Functionally Monitor	27-Jan-16	27-Jan-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1320	Connect Load Bank	28-Jan-16	28-Jan-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
A1330	Start Genset and Load Test	29-Jan-16	29-Jan-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
A1340	Synchronising Setting	01-Feb-16	01-Feb-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
A1350	Grid Breaker Testing With PL	02-Feb-16	02-Feb-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
A1360	No Load Synch Testing	03-Feb-16	03-Feb-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
A1370	On Load Synch Testing	04-Feb-16	05-Feb-16	2	2	\$0	0.00	0.00	\$280	\$280	0%
A1380	Make Commission Report	08-Feb-16	08-Feb-16	1	1	\$0	0.00	0.00	\$280	\$280	0%
+	Handing over	09-Feb-16	09-Feb-16	1	1	\$0	0.00	0.00	\$120	\$120	0%
A1390	Customer Acceptance and H.	09-Feb-16	09-Feb-16	1	1	\$0	0.00	0.00	\$120	\$120	0%

3.5 Project Gantt chart





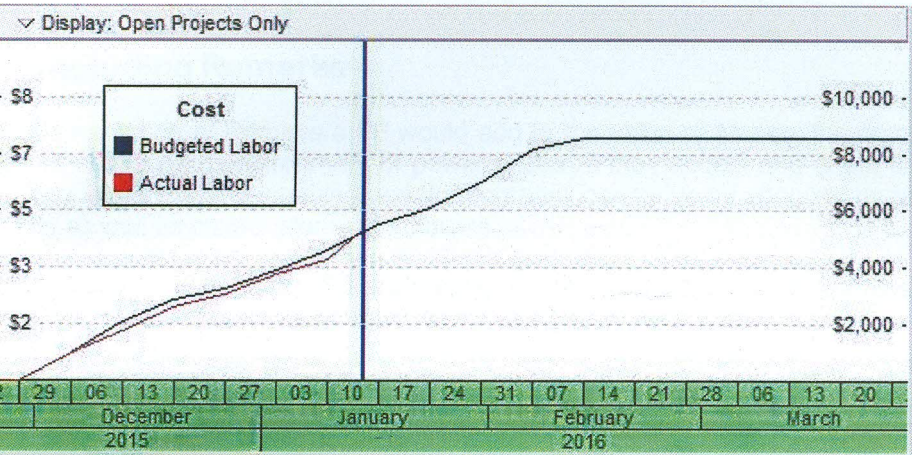
3.6 WBS



3.7 S- Curve Reports for Cost



3.7 S- Curve Reports for Resource



Concluding Remarks

Implementation of Primavera P6 would add to the value of Masco, the company competing in the challenging environment of power sector, if they accept and adopt it in practice. The sector in point is ever-growing and the company can thrive by adopting project management skills as well as project planning software.

We have tried to introduce P6 in planning of power production project of Masco. There is still a room for adoption and practice of advance skills of the software.

We implemented P6 as well as introduced some templates of project management. This practice can provide ease in handling the work more comprehensively.

P6 has been used widely in almost every sector of project management. There are many new versions available but P6 has proved itself to be the most reliable version. In Pakistan this version is still being used commercially.

Mahmood Plagiarism Report

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