"B" GAS PLANT VESSELS REPLACEMENT LOOK BACK AT PT. XYZ

Anna Lucky Meridiana Zaluchu,
School of Business and Management, Institute of Technology Bandung (ITB),
J1. Ganesha 10 Bandung 40132, Indonesia.
Email: almeridiana@yahoo.com

Abstract

Purpose – The look back evaluates the **project performance** of "B" Gas Plant Vessels Replacement that successful to be installed on site with plus and minus following result:

- **Operational Excellence / HES Compliance**: no Motor Vehicle Crash (MVC), no Total Recordable Incidents (TRI), no Spill, and zero accident related to H2S emission.
- **Reliability**: zero downtime due to corrosion at compression system.
- **Budget compliance:** the total spending is still within budget, about 63% of the total original budget.
- **Schedule:** delay in construction execution.

Design/Methodology/Approach – Major deviations of the project performance are investigated by using **Root Cause Analysis (RCA).**

Findings – Based on the RCA, it's found the critical items need to be improved for the future project.

Research limitations / implications – This paper is intended as learning for college students, some data are not included in this paper due to company confidential.

Original/Value – To present an original approach of look back that modelled after incident investigation system.

Key words: Look back, Root Cause Analysis, Operational Excellence, Health Environment and Safety (HES) Compliance.

Research Type: Research paper

1. Introduction

1.1. Background of the Study

During 2010, "B" Gas Plant has experienced frequent downtime that caused production losses. Among the causes of downtime, the single most frequent reason was due to corrosion of the compression vessels, which account for 35% of the downtime incident. To reduce downtime due to corrosion problems and eliminate potential risk of unplanned exposure of toxic gas in this facility, it's proposed to replace some vessels materials with Stainless Steel 316L.

The projects scopes were covering vessels fabrication and erection, including required construction activities such as scaffolding, heavy equipment, and dismantlement of the old vessels.

This paper describes the look back evaluation of the "B" Gas Plant Vessels Replacement Project that already put in service. By doing look back, we can review the actual project performance versus the original commitments for projects.

1.2. Statement of the Problems

"B" Gas Plant Vessels Replacement Project was successful to be installed on site with following results:

1. **HES** result for the project
   Operational Excellence / HES Compliance: no MVC, no TRI, no Spill, and zero accident that was related to H2S emission.

2. **Reliability**: zero downtime due to corrosion at compression system.

3. **Cost** – appropriation cost schedule from the AFE versus actual spending budget
   The total spending is still within budget, but under run 37%.

4. **Schedule** – plan versus actual
   Delay to put in service the project 6 months longer than commitment schedule

1.3. Research Objectives

The research objectives of this paper are:

- To evaluate the project performance of "B" Gas Plant Vessels Replacement through look back
- To find the gaps
- To close the gaps

2. Literature Review

The success parameters of projects in the oil and gas industry, not only seen by the accuracy of time and budget; but also of its success to be able to work safely with no Motor Vehicle Crash (MVC), no Total Recordable Incidents (TRI), no Spill, and zero Accident.

In oil and gas industry, operational excellence is seen as critical driver for business success and a key part of enterprise execution strategy. ***Operational excellence*** *is defined as "the systematic management of process safety, personal safety and health, evironment, reliability and efficiency to achieve* ***world-class performance****."* Operational excellence is integrated with how the project is executed.

Project management was defined by Jacobs (2011) as the management activities of planning, directing, and controlling resources (people, equipment, material) to meet the technical, cost, and time constraints of a project.

Refers to Wibisono (2012) as shown at Figure 1 below, there are three kinds of outsourcing works:

1. Execution
2. Execution, History Reading, Planning, and Scheduling
3. Execution, History Reading, Analysis, Identification, Planning, and Scheduling

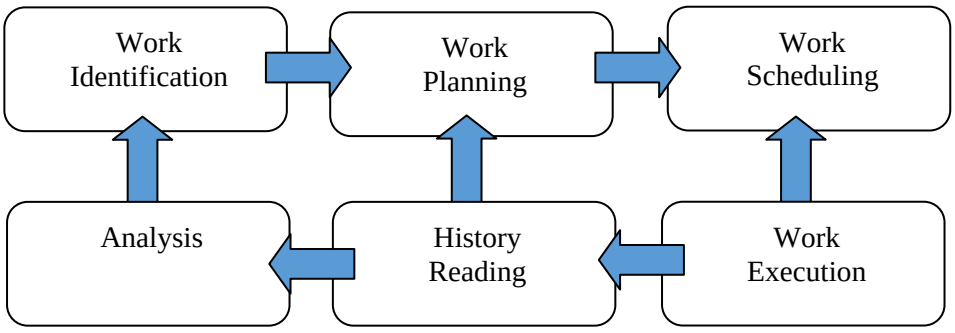

Figure 1 A World Class Maintenance Management System

3. Research Design and Methodology

3.1. Root Cause Analysis

Major deviations of the project performance (cost and schedule) are investigated by using Root Cause Analysis (RCA).

A. Cost

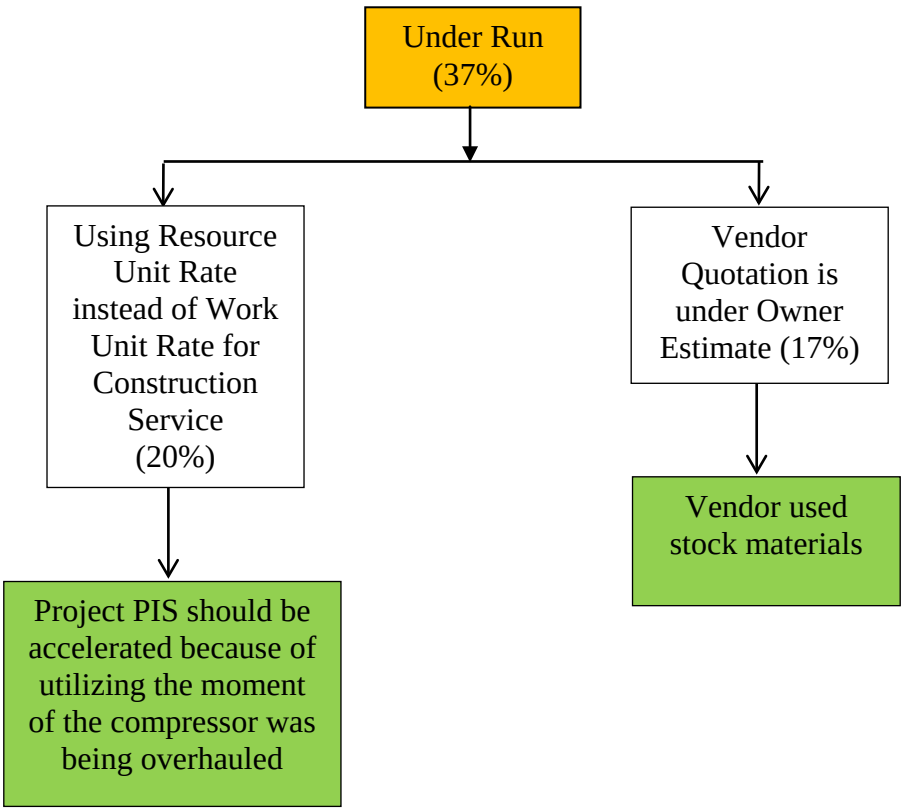

Figure 2 Root Cause Analysis of Under Run Cost

B. Schedule

The comparation of plan versus actual schedule as follows:

Schedule	Q2			Q3			Q4		
Construction execution (plan)									
Construction execution (actual)									

Table 1 Construction Execution Schedule: Plan versus Actual

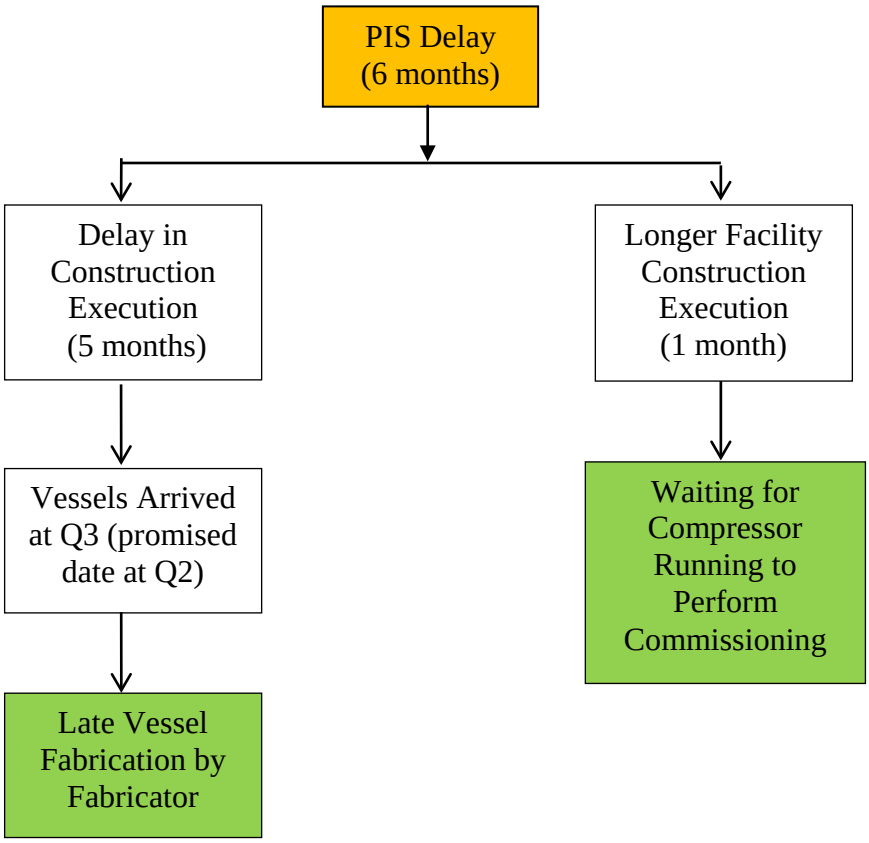

Figure 3 Root Cause Analysis of Put in Service Delay

3.2 Critical Path Method

The critical path of activities in a project is the sequence of activities that form the longest chain terms of their time to complete (Jacobs, 2011).

Critical path method (CPM) helps to identify the critical path(s) in the project networks by:

1. Identify each activity to be done and estimate how long it will take
2. Determine the requires sequence and construct a network diagram
3. Determine the critical path
4. Determine the early start/finish and late start/finish schedule

Based on RCA of Put in Service Delay (Figure 3), the critical path is vessels fabrication which delay had impact to delay in construction execution and put in service project.

4. Data Analysis and Discussion of the Findings

Based on RCA result to the major deviations in project schedule, the critical item that need to be improved for the future project as following:

- Considering what the critical path of project completion (vessels fabrication)
- Monitoring the fabricator progress after Purchase Order (PO) issued by Procurement Division

5. Lesson Learn

The key success of the project that brings to achievement of Operational Excellence and HES Compliance (no MVC, no TRI, no Spill, and zero accident that was related to H2S emission) as following:

- Prepare project progress monitoring tool to remind fabricator to prepare recovery plan to achieve the promised date
- Good communication, coordination, and supervision
- The project was very supported by Construction Team, Operations Team, and Maintenance Team to accelerate the installation during Compressor shutdown
- Coordination meeting was conducted before old vessels demolition and new vessel installation
- Simultaneous Operations meeting was conducted at site among Operations Team, Construction Team, Business Partners and other contractors before started working at the Gas Plant
- Fully support by Operations Team in fit up & installation of vessels
- Project assessment was conducted with Fire Brigade Team and got their support to standby at Gas Plant to spray foaming at the hot working area
- Fully support from Maintenance Team for installing the instrumentation facility for new vessels
- Good team work in resolving construction problem at site among Engineering Team, Construction Team, Business Partners, and Operations Team

6. Conclusions

- The availability of materials, resources, and equipments plays an important role in the completion of a project construction and execution
- To ensure the project can achieve the milestone, we need to identify the critical path
- We need to monitor the fabrication progress after PO, to ensure materials availaibility for construction
- Major deviations of the project performance (cost and schedule) can be investigated by using Root Cause Analysis (RCA).
- The success parameters of projects in the oil and gas industry, not only seen by the accuracy of time and budget; but also how to achieve an operational excellence (no Motor Vehicle Crash, no Total Recordable Incidents, no Spill, and zero Accident)

References

1. Jacobs, F. Roberts., Chase, Richard, B., and Lummus, Rhonda R. (2011). Operations and Supply Management (OSM), 13th ed, Global Edition, McGraw-Hill- Irwin.
2. Wibisono, D., (2012), “How to Create A World Class Company: Panduan Bagi Manajer dan Direktur”, PT. Gramedia Pustaka Utama, Jakarta
3. Wibisono, D. (2011) Manajemen Kinerja: Panduan Penentuan Indikator, Jakarta, Penerbit Erlangga
4. http://www.chevron.com/about/operationalexcellence/