How BP Texas City Increases Predictability and Controls Spend on Operations, Capital Projects, and Turnarounds

Doris Prewitt
Supervisor, Information and Data Control, BP Texas City

Jack Hall
CEO, WorkTech Corp.

Executive Summary

"In its role as the single major collector of cost data and hours executed, WorkTech's Contractor Cost Tracking System (CCTS) is an integral, mission critical part of the maintenance and capital programs at Texas City."

"Giving both BP and non-BP personnel access to the same system serves as a very effective communication vehicle between BP and its contractors. CCTS is integrally woven into the fabric of daily life at BP."

"By getting better visibility and control of contractor billing and payment, Prewitt estimates that BP was able to save $20 million in 2008."

Oil refineries, chemical plants, power plants, and large manufacturing facilities share the ongoing need for general maintenance, capital projects, and turnarounds. Managing the cost and time required to conduct such activities is increasingly important, as the complexity of these critical efforts has grown over the years while the cost of labor and materials has skyrocketed. Companies that increase the predictability and control of their spend will have a competitive advantage that can result in significant financial benefits and improvements in teamwork and cooperation.

This white paper focuses on how BP Texas City, the third largest refinery in the United States with a capacity of producing 10 million gallons of gasoline a day, has employed a single unified support mechanism to enable performance gains not obtained through prior improvements in planning, teamwork, and team composition. We will examine how BP's use of John Boyd's OODA Loop concept, in conjunction with WorkTech's Contractor Cost Tracking System (CCTS), has enabled the Texas City refinery to reduce the time required to collect critical data during turnarounds from 3-18 days to less than 24 hours. This significant time reduction means that management can react more quickly to a complex and fluid process, allowing key decisions to be made faster. Instead of waiting for days or even weeks to receive important information about cost and schedule, BP management can obtain daily status reports that enable better planning, forecasting, and organization.

By gaining better visibility and control of contractor billing and payment using WorkTech's CCTS, Doris Prewitt, Supervisor, Information and Data Control, estimates that BP was able to save $20 million in 2008. This represents 2% of the $1 billion that BP Texas City spends on contractor costs annually. In addition, CCTS has enabled BP to control costs in unexpected ways. As Prewitt says, "our original reasons for implementation of CCTS were primarily administrative in nature, but we discovered

WorkTech
255 Elm Street
West Somerville, MA 02144
617.625.5888

www.WorkTech.com

that the timeliness and detail of cost information from CCTS has a profound impact on our ability to execute other strategies for cost control in all areas. We also find that there is great advantage to the use of CCTS to capture cost for work during not just turnarounds, but for all phases of plant operation."

The white paper also details lessons learned about improving the turnaround process and why traditional methods that focus on teamwork, communications, and planning have not yielded the desired results.

Key Turnaround Issues Facing BP Texas City

Texas City is the largest BP petroleum refinery worldwide and the third largest refinery in the United States. With the capacity to produce 10 million gallons of premium and unleaded gasoline daily at 29 oil refining units, the continuously operating Texas City operation employs 2,000 BP personnel and more than 4,000 contractors from 400 third party companies. Keeping track of more than 44,000 individual maintenance orders amounting to more than $1 billion of contractor costs each year for general maintenance, capital projects, and turnarounds (TARs) requires more than 200 BP employees.

A TAR (the scheduled shutdown of a plant for major maintenance), is a complex process involving large amounts of resources and spending compressed into a short time period. A TAR has many similarities with general maintenance and capital projects, but key differences are that the plant is shut down and the number of contractors involved spikes upward for the duration. Every day that a plant is non-operational means lost revenue as well as spending on the turnaround itself. But the original cost and scheduling plans almost never remain unchanged due to discoveries that may take place during the actual work. An unforeseen disruption such as replacing a broken boiler can have a multiplier effect, making the best laid plans obsolete. With thousands of interrelated moving parts involved in a TAR on a daily basis, managing the process can be a nightmare unless management has the right information and tools at its disposal.

Although the industry has made great gains in TAR planning, teamwork, and communications, the lack of timely information that feeds into the decision-making process suggests that there are still improvements to be made. BP has found that the experience of a TAR at one plant wasn't always transferable to other sites, meaning that the next TAR team often had to start from scratch and wasn't able to build on earlier successes. Despite many improvements made over time, the company was missing a single, unified support system that could be applied to capital projects and general maintenance as well as TARs.

Accelerating the Turnaround Decision-Making Process at BP

One of the difficulties BP had with turnarounds was obtaining the necessary information quickly so that management could make key decisions and adjustments that would have a positive effect on the project. At times, it took days or even weeks after work had taken place to find out what had been done and how much it actually cost. This means that management was always "behind the eight ball," trying to play catch up. Obviously, it is difficult to manage effectively without up-to-date information.

The faster management has the necessary information, the faster management can make an informed decision. The OODA Loop, introduced by USAF fighter pilot and military strategist John Boyd in the 1970's, is a continuous feedback loop based on four integrated steps:

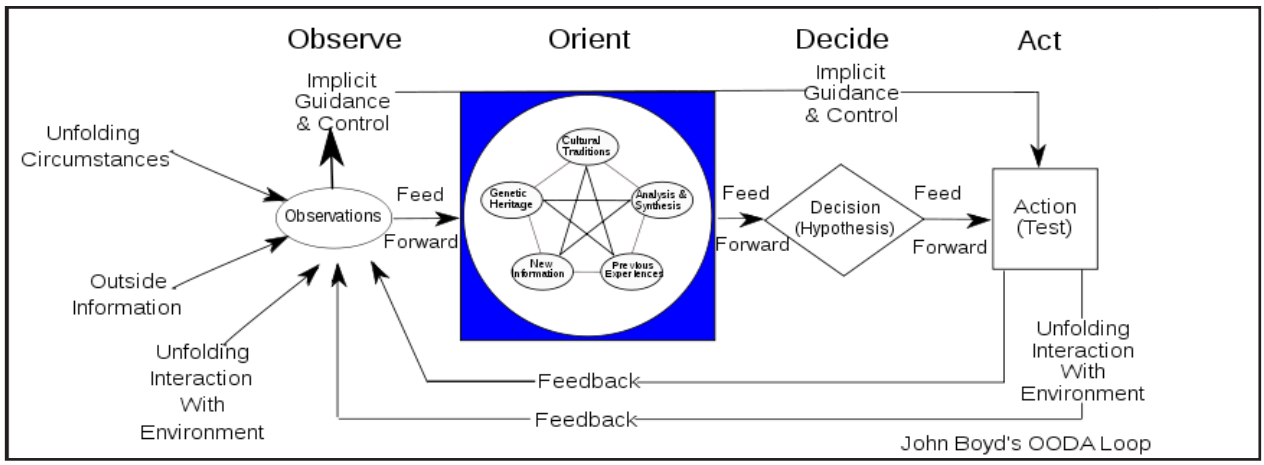
1. Observe – collect data
2. Orient – analyze and synthesize data

3. Decide – determine a course of action
4. Act – put decisions into physical action

Source: http://en.wikipedia.org/wiki/John_Boyd_(military_strategist)

Each step is made up of several components depending on the environment and surroundingconditions. For example, there may be numerous sources of data that are needed for Step 1–Observe, and the data may change as unfolding circumstances change. The data may need to be integrated and validated according to pre-established rules before it can be consolidated and analyzed. Step 2–Orient is undertaken within the framework of previous experience, heritage, cultural traditions, and analysis and synthesis in order to arrive at Step 3–Decide. The four steps progress sequentially in an orderly fashion, and the major feedback loop is from Step 4–Act to Step 1–Observe, but feedback can also take place within the four steps as well. Step 3–Decision may be influenced by new information from Step 1–Observe prior to an action being taken in Step 4–ACT. Taking into account the new information might necessitate a reworking of Step 2–Observe, changing the action going forward. The relationship between the steps is shown in Figure 1.

Figure 1: OODA Decision Loop



Source: OODA Loop, Wikipedia The Free Encyclopedia, 08 March 2009, available from http://en.wikipedia.org/wiki/OODA_Loop. Permission for use granted by GNU Free Documentation License available from http://commons.wikimedia.org/wiki/Commons:GNU_Free_Documentation_License.

Although Boyd's work was initially intended for the military, it has found its way into business and other activities that rely on the timely processing of information. Since the OODA Loop was conceived in relation to combat, consider the turnaround management team as the good guys. The battlefield is the daily execution of work: the spending of money, consumption of materials, and thousands of interactions between contractors and employees of the business. The enemy is mankind's old nemesis: Murphy's Law. "Anything that can go wrong will go wrong." All of us familiar with complex projects know that they can go off course due to the slightest of disruptions. The natural tendency for a turnaround or capital project to deviate from the original plan without the direct intervention or course correction of the management team is defined as our enemy. As they say, "stuff happens."

Conventional industry wisdom suggests that by the time a company is 15% into a turnaround, the performance or productivity to date will be largely unchanged throughout the event – force majeure discounted. But this statistic is misleading because the real reason most companies cannot affect performance so soon into the event is that they can't calculate performance at 15% until they're 30-50% complete! Management is always trying to play catch up. On the other hand, if you knew where the poor performing areas were in near-real-time, the chances of correcting the course would be

significantly better. Root causes of the delay might be late timesheet and invoice submissions, which can be highlighted with the right exception reporting mechanisms. Or the problem might be not knowing how long it will take to replace a defective part. If the critical path for the project is affected, this can result in a major schedule disruption.

BP believes that the lack of timely, comprehensive information is a primary reason the industry is continually "reinventing the wheel" and discussing the same issues at conference after conference. Most operating companies have invested millions of dollars in IT assets and collect and maintain vast amounts of data. The question isn't one of investment but rather how quickly accurate data can be collected, turned into usable information, and supplied to the decision makers in time for the resulting decisions to be meaningful. You can't change events that have already taken place. To use the vernacular of our "turnaround is battlefield" paradigm, what does it take to "get inside" the enemy's loop?

To summarize, a key concept of the OODA Loop is that success depends on a fast response to continually changing conditions. ***Time becomes a dominant measurement.*** The shorter it takes to complete a cycle, the more effective the decision-making process will be. Businesses that "get inside the loop" and execute faster than the competition will have a competitive advantage. Companies that wait too long before they have all the right information in place to make key decisions will be left behind. Accelerating the process and being able to act faster than the competition is key. The old saying "time is money" is entirely applicable here.

How BP Texas City Controls Spend

The control of spend at BP Texas City involves four major systems:

1. SAP Work Management System, used for administration of work. All contractor work is controlled and authorized via the assignment of maintenance orders (MO) that are issued via the SAP Work Management System.

2. WorkTech's Contractor Cost Tracking System (CCTS), used with the Lenel Gate System. CCTS is the timely data capture & accuracy piece of the decision loop. CCTS efficiently captures and tracks detailed cost accounting data for all contractor costs, including labor, rental equipment, materials, and third party charges.

3. Primavera, used for planning and progress. Primavera is the source of direct labor, earnable and earned hours, as well as activity dates used by the fourth system.

4. Faithful + Gould's Epoch, used to integrate the data from the first three systems and produce progress and cost forecasts.

In controlling spend on a turnaround, capital project, or general maintenance, the term "data" refers to all cost elements related to labor, materials, rental equipment, and third party charges as well as work percentages completed and project progress. Some pertinent questions are as follows:

- How accurate are the cost data? Are they checked or verified for accuracy?
- Are the cost data from a paper-based invoice hand keyed into a cost accounting application by a data entry clerk?
- How long does it take to collect the cost data? (i.e., what time requirements are stipulated for the contractors to provide their cost data?)
- Are the charge data provided by the contractor verified against approved rates and schedules

agreed upon in the contract?

- Are the labor charges verified against gate logs and/or work order completions?
- Are the charges against the correct work order/maintenance order, and is the order active?
- Are there checks to ensure the contractor is not double billing?
- Is the date information associated with the data consistent with the date the work was performed and does it align with progress data?

Using WorkTech's CCTS to Improve Cost Control and Prediction

Contractors report all of their spend against a SAP work order/maintenance order via CCTS. For labor, cost transactions have a detail of hour-by-hour accounting for each individual contractor worker against an individual MO. If for example, a worker expends time on three different jobs during a day, there will be three individual records in CCTS that capture all cost related details of the labor for each of those jobs. Tool/equipment rentals, unit price materials, and ad hoc charges are also entered into CCTS. The goal is for all of the cost information for a given shift to be entered within a few hours after shift end.

This information is highly detailed and ready for instant use by line managers, and it provides an accurate picture of both the activity and the spend. Even when the cost transactions are not entered on a daily basis, the feedback level is far superior to past capabilities, where accurate costs were not available for days, weeks, or even months.

Our assertion that timely, accurate data is absolutely critical to the creation of meaningful information with which to make decisions has two parts: timeliness and accuracy. The timely submission of data is an issue for management and the contracts/agreements in place between the company and its vendors. IT systems can facilitate timely submission but not ensure it. That said, BP has established a mechanism to flag variances between the hours "walking" in the gate and those in CCTS. This allows cost analysts to make allowances for the shortfalls, albeit at a high level. However, if the accuracy of the data is not assured, timely collection is something of a moot point. Where CCTS excels is the ability to provide accuracy checks that may either be automatic or manual, depending upon management choice.

In its role as the single major collector of cost data and hours executed, WorkTech's Contractor Cost Tracking System (CCTS) is an integral, mission critical part of the maintenance and capital programs at Texas City. To indicate its importance, it is now used by more BP employees and contractors than SAP, with more 400 contractors representing thousands of people using the system. CCTS is one of the few applications at BP where non-BP personnel are permitted access. It greatly simplifies and limits the permissions required for SAP access. CCTS is so flexible with respect to layout and process that there was minimal disruption during implementation. The training needed to get a new user up to speed is fairly simple and requires less than one day. Expansion from routine maintenance to projects to turnarounds was incremental by contractor. Some special changes were made to accommodate specific contractor needs without having to change the system for all contractors. Each contractor has a lot of leeway in their CCTS set up, yet BP can continue to control security and consistency.

Giving both BP and non-BP personnel access to the same system serves as a very effective communication vehicle between BP and its contractors. We are all looking at the same detailed data, and so the stories are always the same. CCTS is integrally woven into the fabric of daily life at BP.

An "elevator" discussion of CCTS includes the following benefits:

- Provides a single point of entry for all contractor costs
- Provides systematic electronic means to establish unit charges for labor, materials and rental equipment
- Validates all charges for contract compliance
- Simplifies approvals by contractor, and by approving vendor
- Eliminates invoice submission and processing (cost charges are entered directly into the system)
- Expedites payment to contractors (rejections only affect the individual rejected cost item)
- Provides immediate access for all with need to know the current costs of any unit of work
- Provides clear view of overall costs and atomic detail of all charges as they are occurring
- Provides audit trail of all charges and approvals to greatly simplify SOX compliance
- Provides means of reconciliation of contractor charged time to gate access time
- Eliminates lost revenue from contractor overcharges due to limited review of invoices

CCTS is able to provide the following accuracy checks and aids to accuracy for data entered into the system:

- Checks of reported time against gate log by individual worker. This check can be on an exception basis or applied uniformly for all workers reporting time in CCTS
- Business customizable business rules. Because data validation is done according to the actual business rules of the operating company's exact requirements the data is as correct as the SAP or Primavera 'feeder' systems
- Validation of entered costs against approved rates schedules for all cost categories (i.e. labor, materials, rental equipment and 3rd party charges)
- Allowing data entry at or near the time of the event greatly increases accuracy and detail
- CCTS fulfills a communications function between the line or shop foremen and the contractors regarding actual work performed, especially when costs are entered quickly. This communication is an effective check against inaccurate or erroneous cost charges

Extending the Value of CCTS Beyond Turnarounds

BP's original reasons for implementation of CCTS were primarily administrative in nature, but the company discovered that the timeliness and detail of cost information from CCTS has a profound impact on its ability to execute other strategies for cost control in all areas.

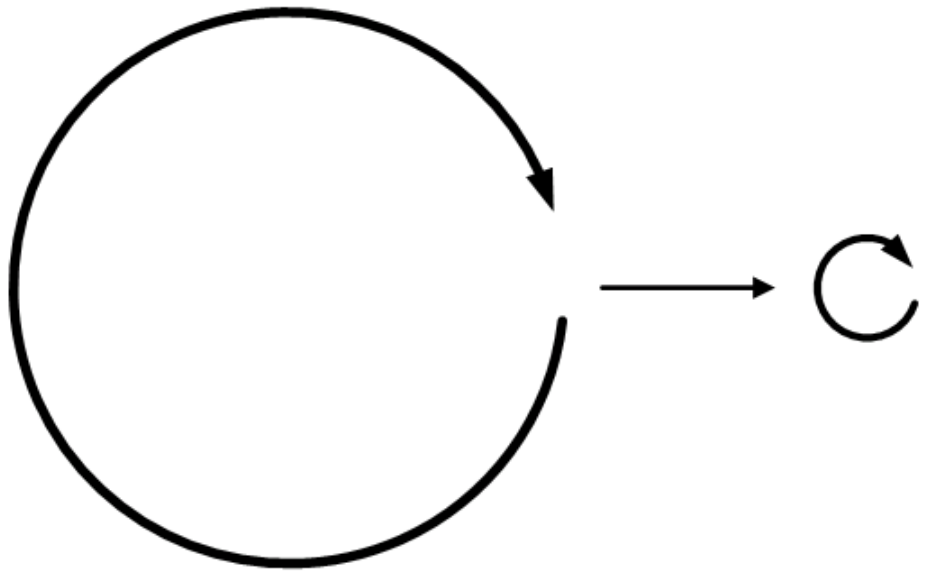
There is a great advantage in using CCTS to capture cost for work not just during turnarounds, but for all phases of plant operation. This paradigm works well for everyone involved, for both BP and contractors. If the process is efficient and streamlined at the clerical/administrative level, this efficiency quickly benefits the operations group, the managers, foremen and contractors performing the work, be it routine maintenance, capital projects, or turnarounds. The overlap of contractors and manager personnel for these three types of work is significant, and there is great efficiency in using the same cost collection processes throughout.

CCTS provides something for everyone. This fact is important, because when BP worked to develop support for a CCTS implementation, there was a great deal of concern throughout the organization that the new system would add to the general burden of the business process and IT resources without adding enough value. As we all know, people resist change. When BP was able to demonstrate significant benefits at all levels of the organization, acceptance was much easier.

Conclusion and Lessons Learned

A turnaround's conflicting demands and rapid pace of events, juxtaposed with the complexity of interactions between vendors and the operating company, compounded with the pressure implicit in the consumption of large quantities of resources in a short period of time, is a very challenging battlefield indeed. BP's time-sensitive feedback loop is now able to keep up with the rapidly-changing dynamics of the turnaround itself, and management can forecast possible outcomes proactively instead of reacting to events that took place a week ago. BP has as close to real-time information as possible and can make the necessary adjustments accordingly. The improved predictability and control that result from CCTS allow the company to build on its successes and leverage past learnings.

Figure 2 – CCTS Allows BP to Make Faster Decisions by Accelerating the OODA Loop



Before CCTS - **3 to18 days**

After CCTS - **24 hours**

Result – Faster Decisions and Quicker Response to Changing Conditions

Prior to the implementation of WorkTech's CCTS at BP Texas City, it took 3-18 days to gather critical information such as field conditions, scope additions, schedule changes, and revised budgets. CCTS, which allows unparalleled visibility into contractor activities and expenses, allowed BP to reduce the elapsed time to 24 hours or even less. Such a dramatic reduction in the time needed to obtain real-time feedback on the turnaround enabled BP to react to developments and changes far quicker than before. As BP's Prewitt says, "The goal is for all of the cost information for a given shift to be entered within a few hours after the end of each shift." By getting better visibility and control of contractor billing and payment, Prewitt estimates that BP was able to save $20 million in 2008. This dramatic savings was due largely to rejected invoices that were not resubmitted. In addition, CCTS has enabled BP to control costs in unexpected ways. Prewitt adds, "our original reasons for implementation of CCTS were primarily administrative in nature, but we discovered that the timeliness and detail of cost information from CCTS has a profound impact on our ability to execute other strategies for cost control in all areas. We also find that there is great advantage to the use of CCTS to capture cost for work during not just turnarounds, but for all phases of plant operation."

BP has made great strides in obtaining the tools required for providing accurate information to their management teams; however, the remaining deficit is that the company does not require vendors/ contractors to report their costs within an acceptable timeframe. The data is still not obtained as quickly as it needs to be. Closing this gap will require intensive negotiations and close collaboration with our business partners and is where BP intends to focus much effort in future.

Our core message is the following:

> Although excellent teamwork, superior communications, superb planning, and knowledgeable, experienced management are all critical to success, just as critical is closing the decision loop via the feedback of timely and actionable information. Predictability and control of spend is dependent on all of these attributes working together. There is no single silver bullet to achieve success.

About WorkTech

WorkTech has been helping organizations reduce their costs and increase their efficiency with flexible time and attendance software since its founding in 1993. WorkTech's Cobntractor Cost Tracking System (CCTS) helps management keep track of the contractors within their workforce. Contractors have direct access to a system configured to validate their contract. Contractor employees directly enter time and attendance information as well as equipment usage, equipment rentals, and materials. Contract managers can immediately review submissions, approve time entries, request clarification, or reject the submission. Real-time reporting helps supervisors uncover inefficiencies in the operation and quickly make the necessary adjustments.

For more information, 1-617-625-5888 or visit us on the Web at www.WorkTech.com.

© 2009 Work Technology Corporation. All rights reserved. Information in this document is subject to change without notice. WorkTech assumes no responsibility for any errors that may appear in this document.