TMG News

April 9, 2001 The Manufacturing Game®

"Sharing Information to Improve Reliability"

The Sequel …BP Greater Forties Unit Montrose Platform

When the July 2000 Manufacturing Game® newsletter was published, 13 of 42 recently formed action teams had completed their defect elimination goals at BP's Greater Forties Unit (GFU). Since that time, more teams have completed their defect elimination tasks, and John Crowther of the GFU highlighted a smattering of the resulting action team successes at BP's January 2001 Champions' meeting.

Some action teams had identified complex, well hidden defects in their equipment. Once revealed, many of these defects were inexpensively and promptly eliminated. Other action teams tackled more obvious defects with equally impressive results in increased production, enhanced HSE, or expanded revenue potential.

One particular action team centered on a proposal put forth from onshore engineers to redesign the Montrose platform's entire chemical injection system. They had a terrible time at the beginning of the year with chemical injection which resulted in very poor produced water quality in the first quarter.

The intention was to spend £250,000 CAPEX (approximately $US388,700) to redesign the whole system. The guys on the platform said, "Whoa–hold up. No need to do that. The real problem is the last

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Eliminating Design Defects

It is a well known fact that many defects are a result of design issues. The Manufacturing Game® has always dealt with design as an important source of defects. In fact, a large number of the action teams that we launch do small redesign projects to eliminate a defect. To effectively get at the root cause of these design defects you have to tackle the capital project management system that produces them. Our Project Value Game® shows how defects come in through projects and what the people responsible for projects can do to minimize them. Clients from DuPont, BP, Vulcan, Sun Oil, NEREFCO and Motiva have used this approach to improve their capital project and turnaround performance.

Root causes of project defects

The defects that come from capital projects have four root causes:

1. Poor definition of the project scope

Example: A number of projects that we have been involved with

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Public Workshop Calendar

Throughout the year, The Manufacturing Game® holds workshops for the general public at various universities and/or professional organizations across the country.

May 25, 2001
Post-NPRA One-Day Public Workshop
New Orleans, LA
To register call
The Manufacturing Game® at
(281)812-4148 or email
info@manufacturinggame.com

June 26, 2001
PIMA's 82nd Annual International Management Conference
Pre-Conference One-Day Public Workshop
Baltimore, MD
For registration and hotel information please visit
www.pima-online.org

September 19, 2001
Productivity, Inc.
Pre-Conference Session
Orlando, FL
For registration information visit
www.productivityinc.com

October 2001
SMRP Conference
Post Conference Session
One-Day Public Workshop
San Antonio, TX
For registration information call
(800) 950-7354 or visit
www.smrp.org

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that were run by very competent project managers had no tasks or deliverables to bring on new operators. The team defined this activity as outside of their scope and the responsibility of HR. By defining the project as only the equipment installation, the team has ensured that start up will be rocky, several important operability issues will be missed and procedures will not be documented.

2. The team focuses on time and budget at the expense of life-cycle costs and quality

Example: A team that we were working with had spent significant time trying to shave about a million dollars off of their budget in response to a Vice President's request. After sharing the overall goals of the project in our workshop, they realized that $1,000,000 off of the project budget was equivalent to only about one-third the value of $1,000,000 from the ongoing operations and maintenance budget and that there were far more opportunities to cut those costs since their implicit target for maintenance cost was three times the industry average.

3. Poor identification and follow through on risks

Example: A recent project team was set to do a large project that required the demolition of hardened concrete. Prior to our workshop they had not considered the possible risks associated with this activity and had no plans to minimize risk or to react to it if it bit them.

4. Poor alignment of the team

Example: On another project, there was a bitter feud between the owner and the electrical contractor. The unit was delaying startup to rewire a significant portion of the facilities. Although the electrical system worked, it was such a mess that the plant management did not think that it could be operated or maintained properly. The contractor complained that they did exactly what was specified. In the end the project ran over budget and schedule and the plant management was going to have to live with hundreds of small defects that they could not justify rewiring. Although The Project Value Game® surfaces these issues and helps the participants come up with organizational, personal, and project specific solutions, we also show participants how to:

- Set project objectives that include life-cycle costs
- Identify and reduce risks on the project
- Keep the team aligned
- Create a clear definition of scope early in the project that will best serve the needs of the organization

The Project Value Game® helps to exterminate the bugs from capital projects and turnarounds at their sources and leads to more reliable, less expensive operations.

Sunoco Toledo Refinery Action Team Analyzes the Analyzer

As told to Kay Barecky by Debbie Everhardt of Sunoco Toledo Refinery

After Debbie Everhardt (operations supervisor), Doug Eldridge and Sandy Daniels (both instrument technicians) participated in a Manufacturing Game® workshop at Sunoco Toledo Refinery in Toledo, Ohio, last November, Debbie decided to do something about a situation that had aggravated maintenance personnel in their unit for over ten years.

Debbie took the lead in forming a highly motivated action team composed of herself, Doug and Sandy, Jim Wallace and Al Felbinger (instrument technicians), Jim Mickelson (instrument engineer) and Steve Cropcho (process technical support responsible for looking at hydrogen purity).

At their first meeting, the maintenance team members expressed frustration with instrumentation problems that required them to be called on to repair hydrogen analyzers two to three times each week. Plant 9 alone has over 200 instrument points, including roughly 40 analyzers. The analyzers provide data (e.g., hydrogen, hydrogen sulfide, and distillation points, percentages in composition) to check in comparing with another variable such as lab samples. These comparisons are critical to finding out how accurate the data is since changes are enacted based on this information.

In order to most effectively obtain relief for overstretched resources and to show expedient, measurable, positive results, the team decided to focus on one particular reformer hydrogen analyzer in Plant 9-3 and eliminate whatever problem it had that kept it in need of constant repair.

Not far into the investigation, the team realized that the dysfunction was not within the hydrogen analyzer at all but in the sample line. The 200 foot sample line's inordinate length was an impediment which made the analyzer inaccurate. Also the line's flexible tubing was improperly supported which contributed to moisture continuously accumulating in low spots. To keep from getting erroneous readings, maintenance had to constantly clean moisture out of cells by blowing or draining it out.

Two instrument mechanics worked the engineers and ultimately recommended putting in a 50-foot sample line. It has been ordered, and when installed, they'll run the new, shorter route with a regulator. The instrument technicians on the team said the line had to hit the analyzer at a specific, regulated range of pressure. The original regulator had worked in the past but, perhaps due to age, wasn't functioning properly anymore, so a new regulator will replace the malfunctioning one to enhance the system's reliability.

During the process of selecting the new line, the technicians mentioned tracing– not the previously used electric tracing, but a bundled type of line already encased with steam tracing. "Tracing" is the term used to describe a cable banded to the line to keep the piping warm and prevent it from freezing up. The electric tracing that was with the old 200-foot line sometimes caused the moisture laying in the line's dips to freeze when it kicked off or malfunctioned. No one would realize it had stopped working until the water froze, but steam tracing will reduce this problem. The new piping incorporates this steam tracing in a bundle. Less manpower will be needed for installation since they'll just install one line (the steam casing bundled with the sample line) instead of having to install both separately.

During this process, Debbie learned that electric tracing can freeze up, malfunction or kick off. Now she and others will look at the other analyzers throughout the entire refinery to determine the best standards for procuring the right tracing in the future.

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10 feet of each injection line. The flowmeters and control regulators aren't fit for the purpose, which is causing injection rate control problems."

They formed an action team to address the problem. Some on the shift contacted the supplier of the regulator who then came out to the platform, had a look at the job, looked at the problem, came up with a better set of internals for the differing chemicals injected, came out to the platform again, installed the new internals and conducted some training for the platform technicians.

It cost £20,000 (about $US31,100) to purchase and install the new regulator internals and get the supplier out there. So far, the injection system of that platform has been a lot more robust–a lot more reliable. £20,000 spent by the action team saved £250,000 CAPEX which would have been spent and possibly still not have solved the problem.

Overall from March 1995 through 2000, BP has seen a downward trend in the number of shutdowns from action team improvements such as this one, and they plan to continue using The Manufacturing Game® to help continue that trend.

Upcoming Project Value Game® Workshops

Greenville Tech
Greenville, NC
June 14-15, 2001
For registration call
(864) 250-8063

Project Management Institute
San Diego, CA
May 3-4, 2001

Scottsdale, AZ
October 4-5, 2001

Nashville, TN
November 3-4, 2001
For registration call
(800) 713-8130 or visit
www.pmi.org

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A four to six-week time span was all this action team needed to successfully complete their goal, despite a shortage of manpower due to a recent turn-around.

Even before the action team proceeds to tackle problems with other analyzers, the benefits of what they have already accomplished are evident:

- monetary value now that maintenance won't be pulled away from other work–often on overtime
- diminishing backlog on other work
- opportunity for proactive rather than reactive scheduling
- encouragement to others to team up in finding and eliminating production-delaying problems
- motivation to go after similar hydrogen analyzer disabling problems

The team is now starting to take a fresh look at some of the other persistent maintenance problems. They found that some instrument problems are so great that it isn't worth the investment of time and effort to get them corrected. Concurrently, they are also reviewing the need for each analyzer and have decided to eliminate some which are redundent or unnecessary.

More action team successes are on the horizon with the enthusiasm of these team members spreading across the Sunoco Toledo Refinery. Additional action teams will be launched in early May in conjunction with a scheduled TMG workshop.

Following NPRA 2001
May 25, 2001
New Orleans, LA

Experience the **new, updated** version of **The Manufacturing Game®** which incorporates all the featues of the original, now enhanced with elements of health, safety, and enviromental issues and constraints on people's time. Register **now** as seating is limited. Call (281) 812-4148 or email info@manufacturinggame.com