



**VALERO'S VICTORY**

*Submitted by James Cesarini (Reliability Engineering) and Luis Carrasco (Project Engineer) of Valero*



A successful action team borne from a Manufacturing Game® workshop at the Valero Refining Company in Texas City, Texas, achieved its goal of eliminating sediment that frequently plugged up the HF Alkylation water curtain (part of a firewater protection system).

The original action team was comprised of Terry Woodson, Marty Poole, Ernie Wukasch, Dennis Alcorn, Kenneth Martin, James Cesarini and Danny Mancuso. Engineers, field supervisors and a project manager were brought together to work with the action team. Traditionally, Valero had taken their firewater out of the

**WESTLAKE GROUP ACTION TEAMS OFF TO A GOOD START**

*Submitted by Gina Jones - Sr. Training Coordinator and TMG Facilitator for Westlake Group, Lake Charles Complex*

In 1999, The Westlake Group Lake Charles Complex in Louisiana was implementing a large-scale efficiency improvement initiative. The initiative was primarily an approach that utilized teams to improve overall efficiencies. That same year, the Vice President of Manufacturing Lake Charles and the Area Maintenance Manager attended a Manufacturing Game® workshop at the NPRA Conference in New Orleans. After participating in the workshop, they recognized that The Manufacturing Game® was the frontline, “bottom up” approach they were looking for to compliment and support the improvement initiative already underway.

The Lake Charles Group worked with Manufacturing Game® staff to put together a team of facilitators to implement a roll out for the Lake Charles Complex. Six Westlake employees were trained and certified as Manufacturing Game® facilitators and delivered 14 of the 15 workshops conducted over the next 15 months. This team also developed the rewards and recognition model for rewarding successful action teams.

Each Defect Elimination Action Team was composed of frontline employees from operations, maintenance, quality control and other support departments. On day two of the workshop, the teams were challenged to identify a defect within their work area and develop a plan of action for eliminating the defect themselves, in 90 days or less for \$10,000 or less- 103 teams accepted the challenge.

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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.

October 10, 2001  
**SMRP Conference  
Post-Conference Session**  
San Antonio, TX  
For registration information  
call (800) 950-7354 or visit  
[www.smrp.org](http://www.smrp.org)

October 24, 2001  
**Productivity Inc.  
Pre-Conference Session**  
Dearborn, MI  
For registration information  
visit  
[www.productivityinc.com](http://www.productivityinc.com)

**Additional workshops are added throughout the year. Please call our office at (281) 812-4148 for other options.**



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Frontline employees are realizing the fruits of their labor and the company is seeing a return on the investment made. Eighteen months, 410 participants and 103 action teams later, the paybacks are beginning to come in. Nineteen teams have successfully completed their defect elimination projects. The remaining teams are in various stages of the process. To date, the combined annual benefit for the 19 combined projects, after costs, is \$1.2 million.

The first project to yield an annual net benefit of over \$100,000 was a project to standardize sample cylinders and connections at the high-density polyethylene unit. The implementation of this project significantly reduced the downtime between sampling for oxygen and starting up production lines after turn-arounds. The project was implemented for less than \$575 and had an annual net benefit in excess of \$205,000 in prevented labor expenses and lost production due to downtime.

The Manufacturing Game® team approach to eliminating defects has certainly benefited the Lake Charles Complex. Those benefits include additional cost savings, improved reliability, and an increased awareness for frontline employees of their impact on the bottom line. Involving frontline employees in identifying and eliminating defects has proven to be a successful approach for the Westlake Group.

## IMPROVED EQUIPMENT RELIABILITY at Michelin - Ballymena, Northern Ireland

*Contributed by Phil Brunt of Michelin-Ballymena*

A Manufacturing Game® workshop at the Michelin facilities in Ballymena, Northern Ireland, spawned a cross-functional action team which targeted and successfully resolved a perplexing equipment problem.

### ***The problem:***

A conveyor belt taking cut rubber away from a guillotine often suffered jam-ups leading to damage to the belt and sometimes necessitating replacing the belt altogether. This equipment failure increased costs in the form of belt material, took up resources (maintenance people to install new belts), and caused production losses (equipment downtime).

### ***The analysis:***

After completing the Manufacturing Game® workshop, the action team took steps to carry out a detailed analysis of the problem. They discovered that within a 260-day period, the conveyor belt jam-ups demanded:

- Operator interventions required to remove minor blockages six times per day, taking a total of one hour each day to clear
- Maintenance interventions for 24 major rubber blockages, four belt double ups resulting in 16 hours mechanical downtime

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(using an average of 25.25 hours manhours), three belt changes (27 man-hours), and 27 hours mechanical downtime, plus a cost of £175 per belt

- Time and attention due to two minor accidents related to removing blockages

This type of equipment, put into service two years earlier, is normally installed with the guillotine at right angles to a narrow belt. In this case, due to space constraints, it was mounted inline with the belt. The belt had been made wider to match the width of the guillotine, with a plough arrangement used to push the rubber to one side ready for the next step in the process. It was this plough that was causing the jam-ups. The Team considered reorganizing the area to allow the standard layout of the equipment as one possible solution. This would have cost around £20K. It was originally thought that the rubber was being forced under the plough by the belt. On closer examination it was found that the rubber was actually bouncing over the leading edge of the plough and being trapped in a void behind the leading edge.

**The solution:**

The team studied the problem and proposed a simple modification to the plough design which, using a piece of metal and a few bolts, was inexpensive to make and install. The modification both closed the

Brazos River outfall using a large pump. Another "jockey" pump (which turned on when the water pressure went down and off when the pressure was right) was utilized to maintain the proper water pressure in the firewater system. Valero's firewater system is a network of underground piping which loops around the plant to connect hose reels, hose stations, fire monitors, fire plugs, etc., in the event they are needed.

Unfortunately, the jockey pump ran incessantly due to operations personnel continuously having to flush the firewater system. The very heavy sediment (river sand and organic material) in the water from the Brazos River continually plugged the refinery's fire nozzles, pigtails on deluge systems, and all other components connected to the firewater system. The pressure was often reduced to levels less than desired to contain an emergency situation.

Every three months, the HF Alkylation water curtain was scheduled to be tested for functionality. Unfortunately, during the testing, sediment would impede the curtain's water flow, and it ceased to perform correctly. Sediment coated the equipment in the unit, and all painted metal began to look rustic orange. Consequently, a safety company would have to be called in with laborers, at a cost of \$10-15K for each incident, to take apart the water curtain, unplug it, and put it back together. The refinery had stopped this quarterly testing due to the expense. This posed a

safety concern. Would the curtain work when called upon in an emergency? And if so, how long would it work?

This costly problem became an action team target item partly because an operator in the HF Alkylation unit wanted the safety system functional again. The team's brainstorming during The Manufacturing Game® workshop led them to the No. 4 pond—a rainwater outfall pond where water was collected and utilized as needed in an over-capacity situation. This pond water was free from sediment. There were already two other firewater pumps installed at the pond that were ready with diesel motors to utilize in an emergency requiring more water. The team realized the solution was to install a third pump that would eliminate the need to utilize both the Brazos River outfall pump and the jockey pump. This would not only eradicate the sediment from the HF Alkylation water curtain, but would also eliminate sediment throughout the entire firewater system!

Funding for the third pump, a Gorman-Rupp model 8" x 6" VGH6E31-B with 17.5 inch impeller and 250 horsepower motor, was approved. This system would be able to provide a minimum of 1,500 gallons per minute of water at 120 psig (discharge pressure) and meets all NFPA requirements. It has a floating suction line to ensure the cleanest water possible. After waiting several weeks to get the pump in, Engineering had it installed. The project was completed May 18, 2001, and the Pre-Startup Safety Review has been completed.



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void and deflected the rubber away from the plough toward the side of the conveyor system. The team also discussed a further modification which would allow the plough to be raised on pneumatic cylinders to facilitate clearing the blockages. They decided not to follow this through since the simple solution would provide the effective results they were seeking.

***The results:***

Twenty-five days after the installation of this simple, cost-effective modification, there had been only one minor jam-up. The operators' frustrations have been removed, the risk of major jam-ups averted, and the risk of accidents eliminated. The resulting enthusiasm of

this successful action team has carried such momentum that they subsequently selected and eliminated a second defect and are currently working on eliminating a third defect.



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**TMG News**

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Operations is now fine tuning the suction line.

Although the completed project cost well above the Manufacturing Game®'s \$5,000 maximum expenditure guideline, the resolution of this issue has solved a continuous maintenance and safety concern for Valero Refinery, and made a lot of people in the plant happy in the process.

