

# SEVEN REFINERIES, ONE SOLUTION

**Marathon Petroleum's decision to standardize on one solution for multiple refineries is providing the integrated energy company with more efficient maintenance and turnaround and better use of its resources.**

BY JANET KREILING

**O**il refineries present a high-temperature, high-pressure environment. So their equipment, from distillation columns and heat exchangers to valves and gauges, needs regularly scheduled maintenance or perhaps replacement – major events called turnarounds.

Marathon Petroleum Company LLC (MPC) is the fifth largest refiner in the United States, with a refining capacity of 974,000 barrels a day and refined product sales of 1.38 million barrels a day in 2005. The company's maintenance must be just as efficient as any other process, especially as worldwide demand for petroleum products is rising and just one refinery going off-line can affect prices.





Turnaround Specialist Sean Levy:  
Gaining overall visibility.

Today, the company owns seven refineries across the country, the result of buying out in mid-2005 what originally was a joint venture with Ashland Inc. Getting them all on the same project management software for maintenance turnarounds took a high priority.

The former Ashland refineries used Primavera for

July to December, 2005.

Next the group developed an aggressive implementation schedule for the seven refineries. “It was important to give all the refineries with upcoming turnarounds enough advance time for them to get used to the new planning process,” Levy says.



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– Sean Levy, turnaround specialist

scheduling and documentation, while the original Marathon refineries were on a mainframe-based system, explains MPC’s Turnaround Specialist Sean Levy. In order to standardize its turnaround processes, Findlay, Ohio-based MPC made the decision to adopt the Primavera enterprisewide solution for all seven refineries.

“Going with one system makes our maintenance planning and operations more efficient,” Levy says. “In addition, our contractors use Primavera. It’s standard in the industry, and it made sense for us to adopt what the majority of the people we work with use.”

#### THE PLANNING PROCESS

Levy served as MPC’s implementation project manager during the transition to the new software, aided by Catalyst Inc., a Primavera Authorized Representative, as well as Accelerated PM LLC. As the transition began, he worked with MPC’s turnaround advisory group, which included the turnaround supervisors for each refinery, to determine what the company wanted to accomplish and how to achieve the goals the group defined.

To get started, Levy asked the turnaround staff to “make a list of all of the things that we all needed to agree on, such as resources, activity codes, calendars, and reports,” which he gave to the turnaround advisory group. The group then met for several days going over all the details for a basic structure around which the new system would be built, and that would work at all the refineries. Overall, that preparatory work took from

The Catlettsburg, Ky. refinery volunteered to be the first to employ the new solution for a small, eight-day turnaround in July, 2006, and its staff began training and implementation the preceding February. The other six locations were scheduled for implementation later in the year and into early 2007.

#### HOW THEY DID IT

Marathon’s implementation takes about four weeks at each refinery. During the first week, Levy says, the MPC implementation team works with personnel on site, delving into the history of the refinery’s equipment, previous projects, and the master job-card files that record maintenance previously performed on each piece of equipment. This information is then transferred into the Primavera database. The group also converts projects currently in planning to the new process.

During Week Two, the team trains all users for two days on the Primavera software, followed by three days on the specifics of how Marathon will use the application.

Week Three is dedicated to working with “power users” – system administrators, planners and others who access the system every day.

Finally, in Week Four, refinery personnel begin to use the software, with the implementation team in the wings in case of any problems.

Thus prepared, the Catlettsburg staff took on its turnaround, an event that went smoothly enough for the refinery to venture ahead with a month-long turnaround in the fall, which was also successful.

## PREPARING FOR A TURNAROUND

According to Levy, a major turnaround can take from 18 to 24 months to plan, and a refinery may need to plan for two or three turnarounds simultaneously. Crackers and cokers, which fractionate oil into its components, and other major systems may be on a maintenance cycle of every four to six years, and a given refinery may have several coming due in consecutive years. That refinery will have overlapping planning efforts, perhaps one for a turnaround in 2007, another in 2008, and a third in 2009.

Once a turnaround begins, the action gets fast and furious. “We may squeeze 800,000 man-hours of work into 30 days,” Levy says. A turnaround, he adds, “is built on the same theory as any other construction project – just greatly intensified. Rather than spreading those man-hours over three to five years, we concentrate them into one month. The work is extremely hectic. During the actual turnaround, we update the schedule every day.”

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Some turnarounds are massive, requiring the complete shut down and refurbishing of the targeted equipment to meet regulatory, safety, environmental and other requirements. The equipment will have been inspected thoroughly in advance of the shut-down, so from the inspection and the equipment’s history, the turnaround team has a good idea of what to expect – for example, how much refractory material needs to be replaced, what valves, gauges and pipes need to be replaced or rebuilt. Throughout the months of planning, layers of detail are added to the



## A Deeper Shade of Green

Marathon Petroleum’s refinery in Catlettsburg, Ky., has been a leader in the company’s wildlife habitat preservation and education programs. For more than a decade, employees of the refinery, located on the Big Sandy River, have tended a 320-acre protected natural habitat. The hilly reserve – peaks reach 1,020 feet above sea level – is heavily wooded with coniferous and deciduous forests. It also features open fields, one of which is now home to wild turkeys.

Following a plan developed with the Kentucky Department of Fish and Wildlife, the Catlettsburg Refinery Wildlife Volunteer Team is working to increase biodiversity on the property, restoring open fields to their native vegetation and building ponds to ensure supplies of water when the site’s own streams run dry during seasonal water shortages.

Under a corporate Lands for Learning program, Catlettsburg employees also help local students study stream, forest and pond ecosystems on the property. The students learn about food chains, the effects of seasons on plant and animal life, and the life cycles of birds, frogs and dragonflies.

### A corporate commitment

These ventures are replicated at all of Marathon’s refineries and at its headquarters in Findlay, Ohio. At Findlay, for example, employees have installed native plant species and informational signage, helped local schools plant trees on school grounds, and sponsored educational programs on forestry.

At the company’s Garyville, La., refinery, 1,360 acres of the 2,950 total not used for refinery and associated purposes, together with a newly purchased 450-acre tract, contain forested wetlands, agricultural and grass lands, and riparian zones. The employee wildlife team has installed feeders for many varieties of songbirds and insects, planted additional native trees and shrubs, and evaluated how to improve the overall health of the area. It, too, focuses on educational programs with local schools.

Activities at other sites include planting 3,000 trees and placing nest boxes around the 386 acres of the Martinsville Pipeline Station in Illinois; improving the soil and planting a wildflower meadow at the North Muskegon Terminal in Michigan; maintaining a warm-season grass prairie with more than 44 species of plants and at least 19 species of wildlife; and building osprey platforms on the Ohio River at Louisville, Ky.

This corporate commitment to being good stewards of the land gives Marathon its deep green credentials. —JK

plan; in the later stages, planning continues with the contractors' cooperation.

The Primavera solution is maintained by MPC; however, contractors can use workstations at the company to assess requirements for their services, enter their requirements for resources and plot their schedules. They can also perform these tasks on their own copies of Primavera and put their input on a disk for integration with the master schedule.

without having to learn a new planning system. In addition, the software is user-friendly, especially in the ease with which users can add new activities, define new fields and perform manpower-leveling. The latter, Levy points out, is a crucial piece of the scheduling process. "When you first set up the schedule, you will have peaks and valleys in manpower demand – you might need 200 pipefitters one day and 600 the next. Primavera helps us even out those

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"Working from the same software is a much more efficient way of doing business," Levy explains, "instead of having contractors work in a different program and then re-enter their data into another for Marathon. In the past, at the plants not using Primavera, we couldn't get contractors to come in and plan using our system. Now having all our refineries on the same software is saving us significant amounts of time and making our planning more efficient."

### **BEST IN CLASS**

Marathon Petroleum Company is finding that the new planning process improves efficiency in other ways as well. Now, Levy says, a planner can move from one refinery or turnaround project to another

peaks and valleys so our manpower demands are more consistent."

But, says Levy, "perhaps the biggest advantage in getting all seven refineries on the same planning software is the overall visibility MPC has gained into maintenance planning. This allows us to plan in a unified manner companywide, enabling us to contract for and deploy resources most efficiently."

Marathon "is the best in class in turnarounds," Levy says. "And, our unified planning process helps us to maintain the efficiency we need to stay at that level of excellence." •

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