

Special Delivery:

IPD a Lean Crowd-Pleaser at New BP Emergency Services Station

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WHITE PAPER



Stringent design guidelines and tight construction controls for BP's new Emergency Services Building at its Whiting, IN refinery could have made for a stressful work environment. But thanks to integrated project delivery (IPD) and a frictionless team effort, the \$22.5-million project is now successfully in the books. And the contractor, designer, and owner all are looking forward to involvement in future projects using IPD.

Designed to protect occupants from overpressure and toxic gas exposure in a damaging event, the new building is the second of several new structures in BP's master plan development for its NW Indiana facility—the sixth largest refinery in the U.S.

Last fall, **Graycor Construction Co.'s** Steve Crowley, along with Lupe Jenkins from BP, and Kent Gurley from international design firm **exp.**, jointly presented on the project at the 16th annual **Lean Construction Institute** (LCI) Congress in San Francisco. The team used its recent successful collaboration to illustrate key benefits of IPD to a crowd that included many of our industry's leading and "leanest" design and construction professionals.

Crowley, a Graycor construction manager and its Chicago

market leader, describes the Emergency Services Building project as an example of "true IPD", made possible by a strong partnership among BP, exp., and nine Trade Partners, subcontractors with a shared interest in the overall profitability and success of the project. They all worked together to complete the facility in 12 months despite the worst winter in recent history.

"This was the most collaborative project I have ever worked on," says Crowley. "The IPD structure allowed everyone to simply put forth great ideas and to work through solutions in a non-confrontational way."

Fruitful collaboration between designers and subcontractors began very early in the project and was a key component to its success. Participants worked closely during the design phase and throughout the entire process, which really helped the team to avoid expensive constructability issues and the likely conflicts that would have surrounded them. Ultimately, this collaboration helped the team to achieve and even surpass many of its project goals, and served as an important **case study** demonstrating the high value IPD can bring to a project.

"Our design team responded surprisingly well to the con-

cept,” says Kent Gurley, exp.’s sector manager for petrochemical services. “Designers and subcontractors established good working relationships. So we worked through a lot of issues that may not have been realized until later in the building process.”

For its part, the owner was just as impressed with IPD. “The project exceeded our expectations... (and) this process led to significant savings and provided many other benefits,” says Brent Harting, BP’s project manager. “The work between the subcontractors and their design counter-parts not only saved costs, but avoided significant change orders over a conventional construction approach. This non-adversarial approach led to great solutions to very difficult problems.”

IPD explained

This delivery method differs considerably from design-build and other negotiated delivery systems in that the owner is not only focused on program and budget, but is also very involved with every aspect of the design. This is so all priorities can be aligned.

On this IPD project, contracts were structured differently to keep all participants focused on the end goal. Contracts for exp., Graycor and key subcontractors were structured as Costs-plus-Fixed-Profit-at-Risk. Costs were reimbursed and the fee (Profit at Risk) was earned based on the team’s collective performance. **Key Performance Indicators** (KPIs) were also set, based on the team’s priorities for the project: Safety, Quality, Schedule and Cost.

Each KPI had weighted, measurable metrics, such as zero OSHA Recordable Incidents, zero punchlist items, meeting substantial completion and close-out dates, and 5% percent savings from the budget. Unlike T&M contracts — which have profit built into hourly rates and material mark-up, so that more hours or more material yields more profit — IPD strips away these elements and only contains Profit at Risk. To truly align each party’s goals with the goals of the project, each party earns the same Project KPI percentage of their at-risk profit. This results in fewer labor

hours, lower material costs, and a combined focus on the project goals, not each party’s own profit.

Success here was based on the collaboration that began during design.

Traditional construction delivery systems, while useful on certain projects, can sometimes lead to the owner, designer and contractor operating in “silos,” with a higher potential for conflict resulting from a lack of communication during the project.

Using their highly technical experience, the trade partner subcontractors reviewed the 30% complete design drawings prior to team meetings, and brought their suggestions to the group table. For example, if the topic was building structure, the concrete, steel fabricator and envelope trade partners would collaborate with the architect and structural engineer. With an open mind, designers would listen to their constructability, design and material recommendations. Then the whole team, including BP, would weigh in and make key decisions necessary for the design to progress.

The BIM model was updated weekly to show progress, and a true collaboration of what is needed, versus what is possible, was achieved.

During design, a total of 133 collaborative items yielded 62 safety benefits, 53 life-cycle maintenance benefits, 148 quality improvements, 119 schedule benefits, and 119 cost reductions. (Combined, this saved 3% off the total cost.)

Compared to a similar design-bid-build project completed two years prior, all KPIs “improved dramatically,” notes Crowley. Zero RFIs, zero punch list items, zero injuries,

fewer changes, and a two-month savings in scheduling were just a few of the many benefits of using IPD.

Once the design phase gave way to actual construction, it was crucial for the project foremen to be just as collaborative in the process. Given the authority to make safety, schedule and coordination decisions in the field, they had to step up and push themselves to work together. To do this, they regularly evaluated what was best for the project as a whole, and made group decisions based on that criteria. In this manner, they addressed schedule constraints such as shop drawing approvals, materials availability, and proper manpower levels. Where possible, equipment was shared, and work that may have otherwise been sub-sub-contracted was simply performed by another existing trade partner via simple transfers of the pooled project dollars.

In the end, everyone was so pleased with the lean, collaborative process that they couldn't wait to use it again. Speaking at the recent Lean Conference in San Francisco, BP's Lupe Jenkins summed up the team's feelings: "The IPD process was so successful that we are hoping to continue to use the delivery method on the balance of our north campus projects."

Graycor's Crowley also is sold on the project delivery method. "Hopefully, the industry will continue to embrace IPD more and more," he says. ■

