

## Shell Deer Park Refinery Benefits from Advanced Process Control Application on Delayed Coker Unit

### Shell

**Project:** Delayed Coker Unit APC  
**Location:** Deer Park, TX USA  
**Completion:** April 2012  
**Industry:** Refining



### About Shell Deer Park

Shell Deer Park is located about 20 miles east of downtown Houston, Texas. In 1993, Shell Oil Company and PMI Norteamerica, S.A. de C.V., a subsidiary of Petroleos Mexicanos (Pemex), formed a 50/50 joint venture, resulting in Deer Park Refining Limited Partnership (DPRLP). The assets of the refinery are managed and operated by Shell Oil Company through Shell Deer Park Refining Company, a division of Shell Oil Products Company (a Shell Oil subsidiary).

Today, Shell Deer Park is home to the sixth largest refinery in the United States with a crude oil capacity of 340,000 barrels a day. The Deer Park Refining complex has a variety of processing units, including a distillation unit, a vacuum flasher unit, a delayed coker unit, hydrotreater units, hydro cracker units, a cat cracker unit, and a platformer unit. The APC implementation is carried out in the delayed coker unit.



## Challenges and Actions Taken

This is the first project in which Shell Global Solutions US has used a contractor outside of Shell for its Advanced Process Control (APC) implementation. Yokogawa's number one priority during this project was to build confidence within Shell. From a technical point of view, the controls on the coker heaters and fractionator were not appropriate during the drum switch operations, which resulted in loss of the valuable product within coke.

Yokogawa precisely followed Shell's methodology of project implementation, actively participated in technical discussions, and took responsibilities that helped build Shell's confidence in Yokogawa. The APC application implemented on the delayed coker unit helped control the plant with less variation, even during drum switch operations, thus recovering the valuable products found in coke which were no longer lost.

## Conclusion

Yokogawa assisted in the project implementation by providing step testing, model identification, model acceptance, pre-commissioning, training to operators and engineers, commissioning, and tuning and post implementation review.

The study shows that the overall delayed coker APC controller returns a benefit, which is almost three times the original promise.

## Customer Satisfaction

Shell Global Solutions and Deer Park Management were completely satisfied with the way the project was implemented and the results achieved.

David Williams, Team Lead in the Process Automation and Control Optimization group, said, "Not only was there an improvement in plant operations with significant benefit, but everyone was also able to buy into the benefit. Benefits like recovering valuable materials out of coke paved the way for us to continue to do APC projects around the globe."

Rick Linn, Product Manager of the Process Control Platform & Products, said, "It is a good example of our cooperation together."

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