



# CHEMICAL PETROCHEMICAL

Responding to  
Today's Petrochemical  
Opportunities

**ZACHRY**

# CURRENT OPPORTUNITIES AND CHALLENGES IN PETROCHEMICALS

## 1

### GROWTH

- Abundant shale gas feedstock advantage fueling resurgence in US chemical and petrochemical sectors
- US consumption of petrochemical products continues to increase
- US leading the way, spurring international investment and export potential

## 2

### EFFICIENCY

- Market favoring quick-response projects to capture current margins
- Lighter feed slates at the cracker will drive increased ethylene capacity
- Ethylene is likely to be polymerized to enhance market potential

## 3

### COSTS

- Booming market intensifies “war for talent” in securing the best workforce for planning, construction, operations and maintenance

## 4

### UNCERTAINTIES

- Shift in feedstocks could negatively impact propylene and derivatives, aromatics
- Concerns include rising capacity in Asia and the Middle East, protectionist tariffs abroad, domestic regulatory policies

**“U.S. petrochemical manufacturers have secured a competitive lead for the first time in more than 30 years, spurring an American manufacturing renaissance.”**

**AFPM 2014 Annual Report**

# ZACHRY ADDS VALUE ACROSS THE LIFECYCLE OF PETROCHEMICAL FACILITIES



## PLAN

We plan with the end in mind – engineering a facility that makes the optimal use of its site, and is designed for maximum efficiency, ease of maintenance and upgradability. We plan this way because we understand the priorities across the full lifecycle of petrochemical facilities.



## BUILD

The construction phase is where the majority of the project risk resides. That is why Zachry has a self-perform model that allows us to manage project risk more effectively, and to respond to changing customer requirements more swiftly.



## RENEW

We work on the assumption that petrochemical facilities can operate for multiple decades - that with strategic maintenance and thoughtful capital investments, our customers should be able to extend the productive lives of these facilities for generations.

# DISTINGUISHED SERVICE ON NUMEROUS PETROCHEMICAL OPPORTUNITIES

## THE SCALE

- ✓ We have worked as a construction or maintenance contractor at more than 200 facilities on the Gulf Coast, from grassroots ethylene plants to major PVC expansions to specialty chemical projects.
- ✓ Our team served as the general contractor in construction of the largest single-train olefins capacity unit in the world at the time of its installation.
- ✓ We've been named as the owner's primary facility-wide maintenance provider at over 50 chemical and petrochemical facilities, including several regional, multi-site engagements. Our focus on efficient and safe multi-skilled maintenance programs and technology achieves high reliability in operations.

## THE SKILLS

- ✓ JVIC, a Zachry Group company, adds the capabilities of the premier provider of turnaround services to the refining and petrochemical industries.
- ✓ Acquiring Commonwealth Engineering, now Zachry Houston Design Center, bolstered our petrochemical portfolio to deliver services across the EPC platform and expanded our presence in the industry's hub.
- ✓ The acquisition of JV Tyler Engineers, now Zachry Tyler Design Center, added key engineering and fabrication skills, particularly in syngas technology and general process engineering.

## THE SAFETY

- ✓ Our highly successful safety culture and low incident rates have resulted in OSHA designating 14 Zachry project locations as Voluntary Protection Program (VPP) Star sites.

# CREATING AND SUSTAINING AMERICA'S PETROCHEMICAL CAPACITY



# OUR ADDED VALUE DURING THE PLAN PHASE OF PETROCHEMICAL FACILITIES

Our capabilities in the '**PLAN**' phase of petrochemical project execution include:

- ✓ Project development and consulting
- ✓ Studies and analysis
- ✓ Front-end engineering design (FEED) program execution
- ✓ Full service design engineering
- ✓ EPC execution planning
- ✓ Project and construction management
- ✓ Professional staffing services
- ✓ Plant start-up and commissioning
- ✓ Plant reliability and maintainability program development

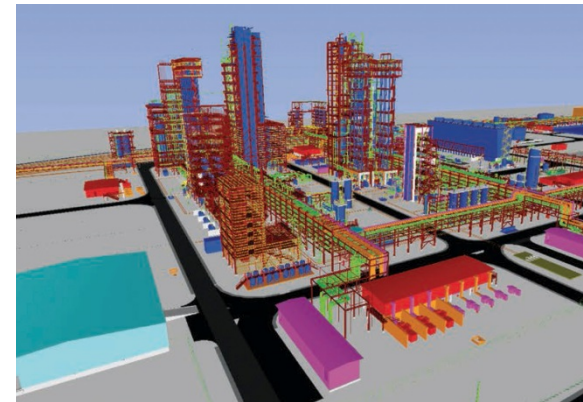


# CAPITALIZING ON ADVANTAGES IN FEEDSTOCK SUPPLY



## THE CUSTOMER'S CHALLENGE

Chevron Phillips Chemical Company LP (CPChem) announced its goal to maintain a first mover position in the petrochemicals renaissance underway in the US. This opportunity has resulted from the abundant feedstocks available from shale resources as well as the company's own development of high-performance polyethylene resins. CPChem's strategy includes developing two new world-scale units – each capable of producing 500,000 metric tons per year of plastic resin – at its facility in Brazoria, County, Texas, where it turns liquid ethylene into metallocene and high-density polyethylene. The restrictive size of the site makes efficient scheduling of a 1,300-member workforce, as well as the movement of equipment and materials, critical to the 2016 completion date.





# CAPITALIZING ON ADVANTAGES IN FEEDSTOCK SUPPLY



## THE ZACHRY APPROACH

Based on the success of several previous capital and maintenance projects, CPChem turned again to Zachry and its engineering partner to provide EPC services for the two units, which include a combined 14,000 tons of structural steel and 600,000 feet of pipe. The tight space requires getting equipment on and off the location in optimal fashion and meeting quality and inspection specifications of the client, suppliers, safety officials and regulatory agencies.

## THE BUSINESS OUTCOMES

Completion of the new units will put CPChem at a competitive advantage in a market that is predicted to remain strong for the next 10 to 15 years. The projected economic impact from this endeavor will include 10,000 engineering, construction and fabrication jobs, encompassing approximately 5 million work hours, as well as generating over 400 long-term direct jobs.

**“With the construction of this mega project, we will be in a position to better serve the growing needs of our customers around the globe.”**

**Peter L. Cella**  
*President and CEO,  
Chevron Phillips Chemical Company LP*

# OUR VALUE ADDED DURING THE BUILD PHASE OF PETROCHEMICAL FACILITIES

Our capabilities in the '**BUILD**' phase of petrochemical project execution include:

- ✓ Integrated, turnkey EPC project delivery
- ✓ Direct hire construction
- ✓ Project management
- ✓ Safety and QA/QC
- ✓ Commissioning and plant/unit startup
- ✓ Small and midsize project experience
- ✓ Large and mega-project experience
- ✓ Firm price, date-certain delivery



# SAFETY IN THE SPOTLIGHT IN REBUILD AFTER INCIDENT



## THE CUSTOMER'S CHALLENGE

The K-Resin Rebuild Project was the result of a plant incident at the Phillips Petroleum facility in Pasadena, Texas in 2000 that caused significant damage to the existing K-Resin Unit. In mid-2000, the chemicals operations of both Chevron Corporation and Phillips Petroleum Company were merged to form Chevron Phillips Chemical (CPCChem). CPCChem awarded the Rebuild Project to Zachry and an engineering partner so the facility could continue to produce the K-Resin styrene-butadiene copolymers (SBC) used in products such as clear disposable drinking cups and other packaging.



# SAFETY IN THE SPOTLIGHT IN REBUILD AFTER INCIDENT



## THE ZACHRY APPROACH

Zachry and its engineering partner worked together to complete a complex and demanding project in an operating facility. The scope of work included all construction disciplines and involved over 1.2 million field work hours with a peak workforce of over 250. Approximately one million feet of wire and cable, and 50,000 feet of process piping was demolished and re-installed. All piping was field fabricated and all field work was performed under intense pressure for safety performance.

## THE BUSINESS OUTCOMES

The project implemented a very strong safety program on site that received corporate recognition for two years. Strong community attention to this location following the original plant incident offered unique community involvement challenges and opportunities for Zachry. This is just one of the many projects to show exemplary results as a result of Zachry's ability to build strong relationships.

**“There are two areas that deserve special praise. The first is the safety performance. Your team worked for over two years and accomplished over 1,275,681 man-hours with no Lost Work Day Cases... the second area is weld quality... out of the ½ mile of weld deposited only 9½” in length was repaired. This is phenomenal attention to quality.”**

**Project Manager**  
*CPCChem*

# OUR VALUE ADDED DURING THE RENEW PHASE OF PETROCHEMICAL FACILITIES

Our capabilities in the '**RENEW**' phase of petrochemical project execution include:

- ✓ Continuous presence plant operations and maintenance services
- ✓ Reliability engineering, assessments & improvement programs and technologies
- ✓ Maintenance skill development
- ✓ Specialty services
- ✓ Turnarounds/outages
- ✓ In-plant capital projects and upgrades



# ALIGNING INTERESTS FOR TOP RESULTS AND SAFETY HONOR



## THE CUSTOMER'S CHALLENGE

Sunoco Chemicals had been using five contractors comprising more than 200 personnel to provide maintenance, reliability and construction services at three facilities. Performance in these areas languished in the fourth quartile. This led to costly maintenance including significant craft overtime, reduced plant availability and safety concerns.



Braskem





# ALIGNING INTERESTS FOR TOP RESULTS AND SAFETY HONOR



## THE ZACHRY APPROACH

Zachry's Industrial Services Group (ISG) consolidated the maintenance, reliability and construction services using a performance-based management alliance model where Zachry's fee structure was uncorrelated to the number of work hours expended. Rather, Zachry would only realize a profit on the contract through specified results in the maintenance cost index, mechanical availability, capital project and turnaround performance, and safety and environmental performance.

## THE BUSINESS OUTCOMES

Maintenance costs were reduced by 43 percent annually vs. the prior baseline in a four-year period (a \$10 million improvement) as the facility achieved first quartile performance. Zachry implemented dozens of high-value capital improvements. Availability improved to 96 percent (from 91 percent). The facility had zero recordable safety incidents or lost time injuries and – soon after Sunoco Chemicals was acquired by Braskem in 2010 – was awarded a VPP Star for successfully identifying, evaluating, preventing and controlling occupational hazards.

# TURNAROUND SUCCESS ENSURES ASSET INTEGRITY FOR DOW UNIT



## THE CUSTOMER'S CHALLENGE

The Dow Chemical Company's Freeport, Texas site is the nation's largest integrated chemical manufacturing complex, employing more than 7,000 people and producing 20 percent of the company's products sold globally. When the plant has to undergo a scheduled process outage for major maintenance work, it's critical that those handling the turnaround must be efficient, safe and effective for the facility to resume reliable production on a timely basis.



# TURNAROUND SUCCESS ENSURES ASSET INTEGRITY FOR DOW UNIT



## THE ZACHRY APPROACH

Dow selected the highly experienced team of JV Industrial Companies, Ltd. (JVIC), turnaround and fabrication specialists to manage its Unit 3 turnaround in the spring of 2014. (JVIC has been a Zachry subsidiary since 2012.) JVIC's expert team has an outstanding reputation for safety, quality, and professionalism. They worked closely with Dow personnel to identify the turnaround's goals, then sequenced the activities to minimize shutdown time and address all necessary maintenance and plant enhancements to maximize its value.

## THE BUSINESS OUTCOMES

Proper plant turnaround management has a significant impact on the bottom line. Without scheduled maintenance outages, equipment will fail, and an unscheduled outage is several times more expensive than a scheduled outage. The cost is much higher still if the outage is due to a catastrophic failure. Positive impacts of a turnaround include an increase in equipment asset reliability with continued production integrity.

**“I would like to thank the JVI group for their excellent performance, attention to details and dedication to a safe workplace during the April/May 2014 Unit #3 turnaround. This group performed a large turnaround with many challenges. I believe they met and far surpassed our expectations.”**

**Contractor Operations**  
*Dow Chemical*

# OUR ABILITY TO ADD VALUE TO YOUR PROJECT IS THE PRODUCT OF OUR DISTINCTIVE APPROACH

## Zachry's approach to business is based on four key principles

### Focus on Distinctive Value

We're always looking for ways to deliver distinctive value to our customers – through performance on immediate work and through using the freedom that our structure allows to focus on value beyond today's bottom line.

### Priority on Customer Success

We recognize customer success is the basis for our success. We work to understand your goals so we can collaborate effectively and identify opportunities to enhance your business outcomes.

### Right Team in the Right Place

We've assembled an extraordinary professional workforce. We continue to invest in training and development to keep their skills on the leading edge.

### Adaptive Excellence in Execution

We believe every project is unique. Our self-perform model, integrated capabilities, loyal workforce and stable project teams allow us to deliver outstanding execution safely under any conditions.

## WHAT WE WANT YOU TO KNOW

The Zachry Group's approach to doing business is purpose-built to help you take advantage of your biggest opportunities and tackle the challenges that you will face along the way.

Like you, we are completely focused on accountability for results. Our entire operating model is designed to deliver that accountability – from our lifecycle mindset to our self-perform execution capabilities.

We recognize that the projects we do represents some of the biggest commitments that our customers make – not just for them, but for the customers, communities and employees that depend on them.

# LET'S CONTINUE THE CONVERSATION IN PERSON

We would welcome the chance to learn more about your needs.



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