REFINING IN THE GLOBAL MARKET

PURDUE UNIVERSITY
ME 290: Global Engineering Professional Seminar

October 8, 2015

Jim Overman, Manufacturing Excellence Manager
Shell Deer Park Manufacturing Site
A LITTLE ABOUT ME

- Purdue University – BSME (1980)
- University of Houston-Clear Lake – MBA (1983)
- Shell – 35 years
  - Manufacturing Sites (Deer Park, TX (Houston) and Wood River, IL (St. Louis))
    - Engineering
    - Production (Operations)
    - Business Development
  - Central Office
    - Supply
    - Commercial Marketing
    - Opportunity Development
    - Strategy Execution
    - Technical IT (Global)
- Current
  - Deer Park Site Manufacturing Excellence Manager
  - Vice President Business Management, Deer Park Refining Limited Partnership (in transition)
OVERVIEW

- About Shell
- Refining Environment
- Our Response
- People Impact
One of the world’s best known brands

2014:
Revenue – $421 bln
Net Income – $14.7 bln
CFFO – $45 bln
Capital Invest. – $23.8 bln

Producing the equivalent of 3.1 million barrels of oil every day

24 million tons of equity Liquified Natural Gas (LNG) sold in 2014

Employs 94,000 people in more than 70 countries

Active in alternative energies such as biofuels and wind

Interest in 24 refineries across the globe

Partners in innovation with Ferrari F1 team and Penske Racing (Indy and NASCAR)

Selling transport fuel to some 10 million customers a day
SHELL MANUFACTURING WORLDWIDE

NORTH EAST EUROPE (Atlantic)
10. Pernis JV
11. Fredericia

AMERICAS
1. Scotford Site
2. Sarnia
3. Puget Sound
4. Martinez
5. Deer Park Site JV
6. Port Arthur JV
7. Norco JV
8. Convent JV
9. Buenos Aires

EU (Nordic, Central, Med)/AFRICA
12. Harburg
13. Rheinland
14. MIRO (Karlsruhe) JV
15. PCK (Schwedt) JV
16. Durban JV
17. SAS REF (Al Jubali) JV

CHEMICALS
A. Deer Park
B. Geismar
C. Norco/St. Rose
D. Mobile
E. Scotford
F. Pernis
G. Moerdijk
H. Jurong

EAST
17. SAS REF (Al Jubali) JV
18. Karachi
19. Port Dickson
20. Pulau Bukom
21. Tabangao

Employs over 30,000
Operationally controlled (21):
• 4 integrated sites
• 13 refineries
• 4 chemical plants

JVs Not Under Operational Control (11)

Daily inventory - $325 million
Daily refining capacity – 4 million barrels
SHELL DEER PARK: OVERVIEW

- Fully integrated refinery and petrochemicals plant
- Operates 24/7, 365 days/year
- 1,600 acres on Houston Ship Channel
- By volume, dock is 25th largest US port
- 1,600 employees + contractors

REFINERY:
- 330,000 b/day
- Primary products – gasoline, ultra low sulfur diesel, jet fuel
- 50/50 JV with PEMEX

CHEMICALS:
- Annual volume production is 2.5 mln tonnes (approximately 5.7 billion lbs)
- Key businesses:
  - Aromatics: Benzene, xylene, toluene
  - Light Olefins: Ethylene, propylene, butylene
  - Heavy Olefins: Isoprene, butadiene, piperylene
  - Phenol, Phenols
Large changes are taking place in the supply of oil and refining capacity on the back of fiscal and economic uncertainty. These changes include:

- **LTO & Gas Growth**
- **Discounted Crude**
- **Low Cost Energy (NG)**
- **Strong Refinery Margins**
- **Increasing Exports**

- **Declining product demand.**
- **Demand Imbalance.**
- **Over Capacity**

- **Supply Diversification**
- **Sanction drive slowdown**
- **Increasing Complexity**

- **Short Supply**
- **Strong Capacity Growth**
- **Demand Uncertainty**
- **Negative Margins**

- **Economic Slow Down**
- **Reduced Investments.**
- **Increased Import dependency**

- **Supply Disruptions**
- **New Mega Refineries**
- **Short Gas/Growing NGLs.**

- **Growing Demand**
- **Crude Exports**

Culmination of external industry data
With these mounting pressures, why stay in Refining?
**OUR BUSINESSES**

**Upstream** refers to the ways we find and extract crude oil, natural gas and oil sands.

**Downstream** refers to the ways we transform them into finished products (including refining and marketing activities for oil products and chemicals).

- **GAS** for cooking, heating, electrical power
- **FUELS AND LUBRICANTS** for transport
- **CHEMICAL PRODUCTS** for plastics, coatings, detergents

- Exploring for oil and gas
- Producing oil and gas
- Mining oil sands
- Extracting bitumen
- Regasifying LNG
- Converting gas to liquid products (GTL)
- Developing biofuels
- Developing fields
- Generating wind energy
- Trading

**B2B sales**

**Retail sales**
UNLOCKING VALUE IN THE END-TO-END PROCESS

Trading Margin

Crude margin        Refinery margin        Product margin        Marketing margin

Crude acquisition and supply
Manufacture of products, intermediates
Product supply & primary distribution
Market and deliver to customer
A FUNDAMENTAL CHANGE IN OUR WORK

From running the kit...

To running the business
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<th>OUR FOCUS</th>
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<tr>
<th>FLAGSHIP</th>
<th>PEOPLE</th>
<th>GROWTH</th>
<th>RUNNING GREAT EVERY DAY</th>
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<tbody>
<tr>
<td></td>
<td>• Foundation of our success:</td>
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<td>• Core activities</td>
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<td></td>
<td>• Develop &amp; grow our People</td>
<td></td>
<td>• Safe &amp; Stable operations with Minimal Distractions</td>
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<td>• Responsible &amp; active neighbor in community</td>
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• Pursue strategies for long term & sustained growth:
  • Chemical plant
  • Refinery
All Shell graduate candidates are assessed on the following criteria:

**Capacity** – How well you absorb information, analyze problems, make fact-based decisions, and propose innovative solutions.

**Achievement** – How well you get things done (your drive, resilience, self-confidence, and organizational skills).

**Relationships** – How well you work in teams, communicate, and respect others.

In addition to the above, individuals interested in technical roles will be assessed on their understanding of their study discipline.

**Technical** – Skills relevant to the specific role for which they apply.
SUMMARY

- Refining is a globally competitive business.

- For Shell, refining and petrochemical manufacture are important parts of Shell’s integrated value chain.

- Our challenge is to move from ‘running the kit’ to ‘running a business’.

- Our people are our key to success.