



## Motiva Port Arthur Crude Expansion Project Fact Sheet



### Crude Expansion Project (CEP) Overview

- Additional 325 MBD capacity
- Will be the largest refinery in the US (600 MBD) and one of the largest in the world
- Start-up completed 2nd Quarter 2012
- Additional Production from CEP:
  - Over 6.0 million gallons/day gasoline (~400,000 cars filled up/day)
  - Over 3.4 million gallons/day of ultra low sulfur diesel
  - 1.3 million gallons/day jet fuel
  - 8,000 tons/day petroleum coke (~100 rail cars/day)
  - 1,050 tons/day sulfur (50 trucks/day)
  - Plus LPG (8MBD), propylene (5 MBD), butane (3 MBD), iso butane (1.5 MBD)

### CEP Units Summary

#### **VPS5/SGP**

The unit is designed to process 325 MBPD of crude. The unit will consist of an Atmospheric and Vacuum Section. Light ends-Naphtha is processed in the Saturates Gas Plant which is integrated on the VPS plot. Products include avjet distillate, diesel distillate, heavy atmospheric gas oil, medium vacuum gas oil, heavy vacuum gas oil, and vacuum residuum.

#### **DCU2**

The purpose of the Delayed Coker is to process the vacuum residue from VPS 5 to make higher valued distillate products. The six-drum unit is based on ConocoPhillips ThruPlus Coking Process. In addition to vacuum residue, the unit will serve to reprocess several refinery streams: recovered oil, refinery wastes, and FCCU heavy cycle oil. The DCU is rated at 95 MBPD of feed. The Delayed Coker products are Treated gas for refinery fuel, Treated propane/propylene for petrochemical feedstock, Treated mixed butylenes for alkylation feed, Full-range Coker Naphtha, Light gas oil, Heavy gas oil, and Petroleum Coke.

#### **HCU/DHT**

HCU2 is an integrated 75 MBPD Hydrocracking unit with a 60 MBPD Distillate Hydrotreating section. The HCU section consists of two first stage reactors operating in parallel ultimately feeding into a recovery section that serves to produce product and recycle feed to the second stage, which also returns to the same fractionator for product recovery. Feeds to the HCU include Heavy Coker Gas Oil from both DCUs, Extracts from the lube operations and Medium Vacuum gas oil from VPS5. Products are a hydrogen rich stream, a treated fuel gas, a mixed propane-butane stream, Light and Heavy Naphtha, light and heavy ULSD, and unconverted oil for FCCU feed.

The DHT section is designed to produce ULSD as the primary product but does generate lighter than diesel material from side reactions at higher reactor temperatures. Feedstock include

diesel from the VPS5, light Coker gas oil, and light cycle gas oil. It shares some equipment with the hydrocracking section.

### **NPC**

The Naphtha Processing Complex consists of four units: NHTU2 - a Hydrotreating section rated at 113 MBPD, Naphtha Splitter, Penex – 50 MBPD C5/C6 Isomerization, and CRU5 – 85 MBPD UOP continuous regeneration catalytic reforming unit. The NPC is designed to hydrotreat, fractionate, improve octane and limit the benzene content of a blend of naphthas received from the CEP and base plant. The main product streams from the NPC include: C5/C6 Isomerate, C4 and lighter, high octane reformat and hydrogen for internal PAR consumption.

### **CFH**

The “Cat Feed Hydrotreater” is licensed by SGS. The design rate is 50 MBPD of vacuum gas oil streams from VPS5. Its primary product is low sulfur FCCU feed. Fuel gas, naphtha and diesel are co-products. A PSA for upgrading CRU produced hydrogen will be located at the CFH.

### **SULFUR RECOVERY COMPLEX**

The sulfur recovery complex consists of: three sulfur recovery units, three tail gas treating Units, two amine regeneration units, and two sour water strippers. The sulfur recovery units (SRU) will process amine acid gas and sour water acid gas. The three units combined are capable of producing 1050 LTPD of sulfur on air. With oxygen enrichment, two units will be able to carry the load without curtailing the CEP units. Each sulfur recovery unit configuration includes a three-stage Claus unit, equipped with ammonia destruction systems, followed by a SCOT Tail Gas Treating Unit and sulfur collecting pit and a licensed Shell sulfur degasification system. The sulfur recovery unit is required to achieve a sulfur recovery efficiency of 99.3% for total feed to the sulfur recovery unit.

### **PS4**

PS4 consists of four GE Frame 6B Gas Turbogenerators (GTG) with independent heat recovery steam generators (HRSG). Each GTG will produce 36.5 MW at 13.8Kv and its respective HRSG will generate 400 MPPH of steam at 1500 psig utilizing supplemental firing. Voltage will be increased to 69 Kv for distribution. A stand-alone power boiler rated at 400 MPPH will provide steam at 1500 psig.

### **LOGISTICS**

Crude for CEP will be routed through a third party terminal. From the new terminal it will be transported to PAR via pipeline and stored in Miller Tank Farm. From there it is proportioned to VPS5.

Intermediates and base stocks for blending will be stored in a combination of new and existing Tankage located in the South Tank Farm. CEP downstream units will predominantly receive feed streams via upstream units without the use of intermediate Tankage. Provisions are included to feed from tanks to manage inventories.

Transportation fuels (motor gasoline and diesel) will be routed to a third party terminal owned and operated by Enterprise. Gasoline and Diesel will be produced via in-line blenders directly to the third party terminal. Finished Avjet will be batched from tanks in South Tank Farm to the new terminal. No finished Gasoline or Diesel Tankage will exist at PAR after the project.

Propane and DCU propane-propylene will be sold as petrochemical feedstock.

Butane will be stored at PAR's existing salt caverns located in Sour Lake, Texas, or routed via a new third-party pipeline to storage at Mt. Belvieu.

### **Module Facts**

- All of the modules arrived at the Port Arthur docks via barge.
- Most modules were 100 feet wide by 400 feet long.
- 322 modules fabricated offsite
- The piperack sections are 120 feet long, 60 feet tall and 50 feet wide.
- The largest one weighed 2,200,006 pounds
- Module program encompasses about 60 % of the steel and 65 % of the pipe.

### **Construction Facts**

- At peak construction, there were more than 14,000 construction workers on the project.
- 2,000 pieces of engineered equipment
- Three 16,000 horse power motors
- ~63,000 concrete piles driving into the ground to form the foundation for the various units
- 285,000 cubic yards of concrete (over 40,000 truck loads)
- 156 million pounds of structural steel
- Weld and install over 700 miles of pipe
- Install over 1,000 miles of cable
- 125,000 to 175,000 Semi-Truck loads of Material
- Flares – 400 ft. tall