

Refinery Upgrade

Between 1993 to 1997 Petrotrin undertook and successfully completed the Refinery upgrade Phase 1 at a cost of US \$ 360 million. This was one of the most technically complex engineering projects ever undertaken in Trinidad and Tobago but it was absolutely essential in order to improve environmental compliance and overall refinery economics.

The Refinery Phase 1 Upgrade Project sought to improve refinery economics through the following:

- Rehabilitation of No. 2 HTU and its conversion to a mild Hydrocracker unit
- Construction of a new hydrogen unit and hydrogen compression facilities
- Construction of a new sulphur recovery unit and handling facilities
- Construction of a new Visbreaking unit
- Rehabilitation of the idle No. 2 CRU
- Revamping of the FCCU to enhance cracking capability, including the replacement of the reactor
- Upgrading of environmental facilities and systems
- Rehabilitation of tankage and piping systems to support increased operations
- Replacement of existing obsolete pneumatic analogue instrumentation by modern DCS to improve operational efficiency
- Upgrading of utility systems

The Phase 1 Upgrade promised to increase process flexibility, improve yields and product quality, improve air emissions and water effluent quality, and be cost effective.

As a result of the upgrade the refinery's capacity to convert oil into higher-value refined products increased by 78 percent. Petrotrin has consistently produced and marketed refined products that meet ever- stricter customer specification standards. The Refining and Marketing Division achieved a profit in the fiscal year 1997-98 for the first time since the Gulf War of 1990 and became much more competitive in terms of major industry-wide comparative performance indicators.

The oil business, however does not stand still. Petrotrin today, needs new sources of crude, a virtually new refinery, a significant injection of new capital and new markets. Petrotrin operates in a highly dynamic and competitive international environment and it must change constantly in order to respond to challenges in the global energy environment.

World demand for refined products is expected to increase from current levels of 75 million barrels per day to 115 million barrels per day by 2030. It is projected that almost 75% of this growth will be in the transport sector.

There is also expected to be a shift towards light and middle distillate products, away from heavier oil products currently mainly in use in industry. This will have major implications for Petrotrin whose product slate must reflect market demand. With the increasingly stringent product specification requirements in the developed world markets, global refinery complexity is expected to increase in order to raise yields of light middle distillate products to match the changing global market demand profile."

Gas to Liquid plants would assume increasing prominence as the demand increases for clean liquid fuels.

To face the challenges of the future, the Refining Division is now focusing on strategies aimed at:

- Achieving maximum refining margins through optimal use of physical assets
- Improving plant reliability
- Improving cost and operational efficiencies
- Increasing sales into premium markets
- Developing human resource skills- teamwork, learning and skills enhancement and zero tolerance with respect to health, safety and environmental compliance
- Building completely new plants and infrastructure from scratch

In 2000, a study conducted by Arthur D. Little had recommended that Petrotrin adopt a strategy focused on high-quality clean fuels through investment in diesel hydro-treating facilities and gasoline quality upgrade, exploitation of strengths in crude processing, and product flexibility. The current initiatives at the Refining Division are aimed at implementing that strategy.

The investment in diesel and gasoline upgrade would provide a platform for further upgrades, The Refining Division business plan focuses on key projects aimed at meeting increasingly stringent product specifications, increased gross margins and greater emphasis on HSE issues.

Petrotrin's vision of becoming the premier supplier of quality products in the region and beyond within the next five years can only be achieved by organizational excellence, appropriate risk management strategies, deeper market penetration, improved operational efficiency, improved distillate yields and gasoline and diesel quality, full HSE compliance, and the integration into petrochemicals production and power generation.

To this end, Shell Global Solutions have been engaged on a five-year plan to optimize the existing refinery by deriving greater efficiencies from the existing plants. The Journey Toward Excellence (J2E) initiative has been making steady progress in improving refinery processes especially in the areas of cost reduction, energy utilization and HSE.

The Refining Division is on the third year of the J2E Programme and this year focus will continue on HSE, effectively maximizing net revenue by the optimization of the use of its physical assets, performance improvement and cost reduction initiatives- some of the main elements of the Refinery Performance Improvement Initiative of the Strategic Plan.

The Gasoline Optimization Programme is another current initiative that seeks to add five new plants that at the end of the day will see the refinery producing higher quality diesel and gasoline. This initiative partially addresses the major challenge of operating aging equipment at a time when international product specifications are becoming increasingly stringent due to environmental trends and legislation. When completed, the project will ensure a more efficient refining process and also afford Petrotrin a better return on every barrel of crude oil processed as well as higher quality products.

Construction of the Gasoline Optimisation Projects is scheduled to begin this year, beginning with the Isomerization Unit.