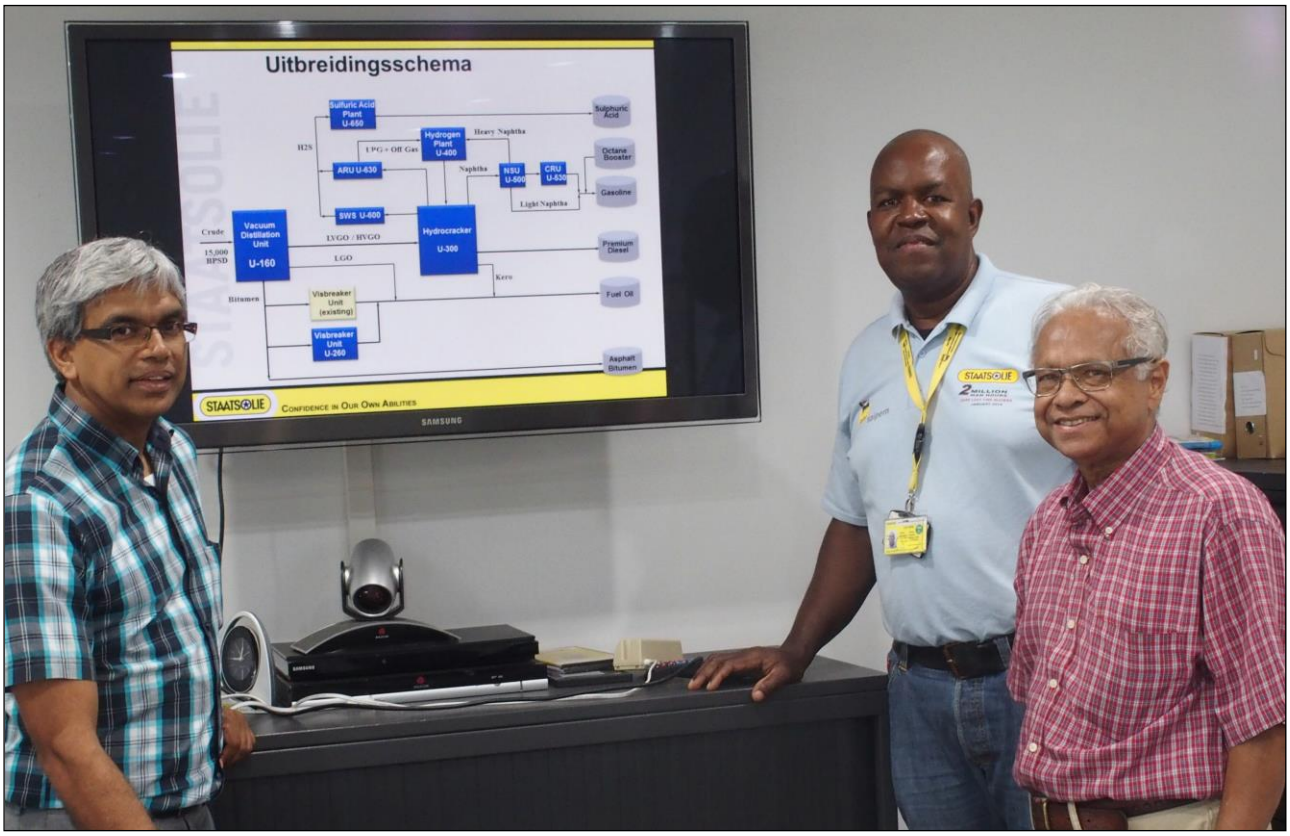
The New Staatsolie Refinery, Processes and Products



At the invitation of Annand Jagesar, Deputy Director Downstream, former Staatsolie Managing Director, Eddie Jharap, visited the new refinery at Tout Lui Faut on Wednesday 20 April 2016. Being impressed by the biggest and technologically most advanced oil plant built Suriname till now, he has decided to share his experience with the public.

Products

From the day the new refinery was put into use, five finished products are made: high quality premium motor diesel and premium motor gasoline, fuel oil (in various kinds), asphalt bitumen (as needed) and sulfuric acid. The table below shows to which extent Staatsolie is now able to meet the local need of the various products:

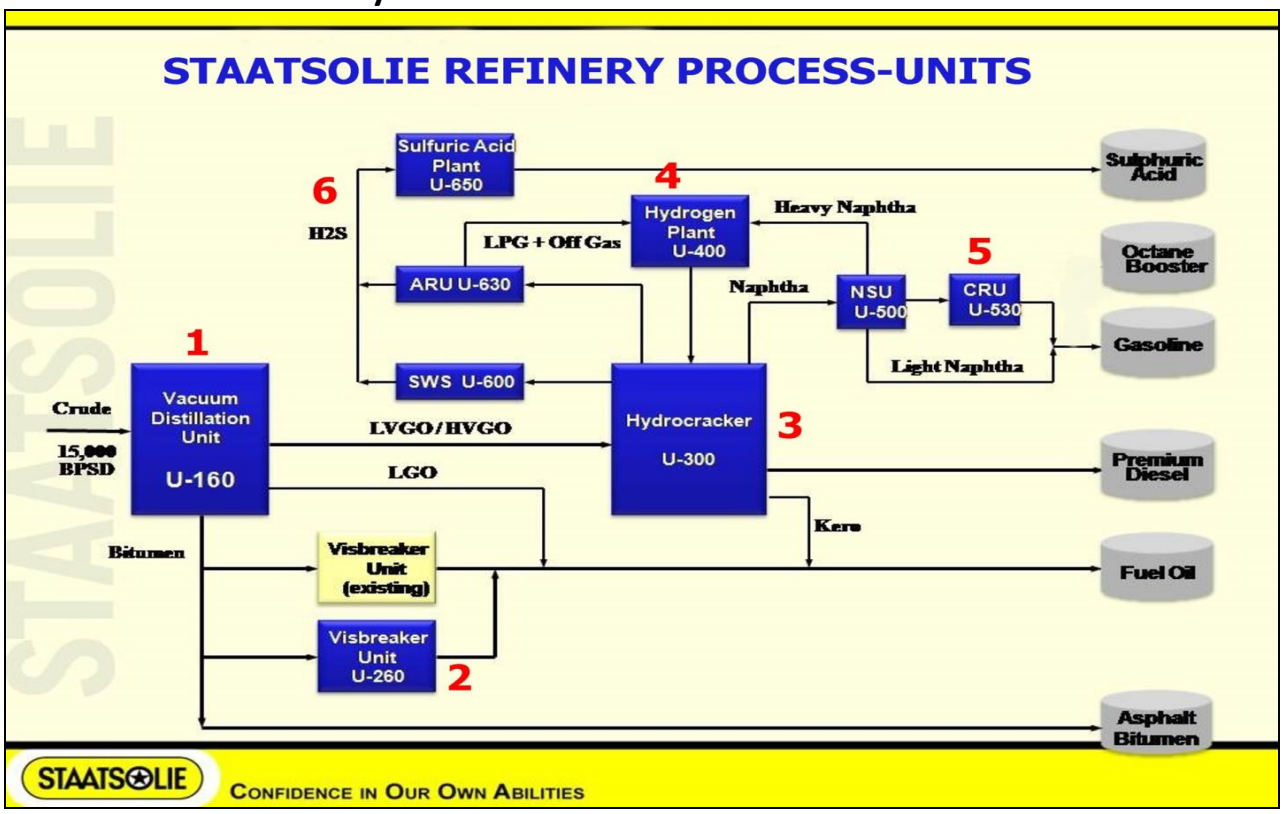
Product adjusted to the local market

Product	Production per day (bpd)	Domestic Coverage
Diesel	8,000	>150%
Gasoline	2,500*	65-80%
Fuel Oil	6,000	75%
Bitumen	100**	100%
Sulfuric Acid	100	>>100%

*) With Ethanol as Octane booster
**) Bitumen production as per demand

1 Barrel= 159 litres of oil

Processes of the refinery



The refinery consists of ten units which play an important role in producing the finished products. In order to understand the operation of the plant, I shall, by way of illustration compare the refinery with a pail of petroleum filled with marbles of all kinds of colors. Petroleum is not a single product, but it consists of various kinds of oil products (the marbles), each with special characteristics, such as various cooking temperatures and varying in weight. When refining these characteristics are used. The refining process of the new Staatsolie refinery can be subdivided in six various and important processes (see attached process scheme).

I. Vacuum destillation unit (U160)

In this unit the Saramacca Crude is the first. Here the oil is warmed and the pressure of the kettle lowered, through which, on the basis of the differences in cooking temperature and weight of the various oil products (the marbles), the separation takes place in:

a. Light and heavy vacuum gas oil;
b. LGO (other light liquid constituents); and
c. Bitumen, (the residue (remainder) heavy non-liquid rest oil).

II. Viscosity breaker unit (U200/U260)

The Saramacca Crude has no light oil products as petroleum and gasoline. More than half of this crude oil consists of asphaltic bitumen. As we are interested in fuels, a large part of the thick bitumen is broken off in the viscosity breaker. Through this the material becomes more liquid and is diluted further with kinds of light oil in the vacuum-unit and the hydrocracker. Depending on the question various kinds of fuel oil are made. Fuel oil is used, among others, ships engines and electric power stations. Worldwide there is a large demand for this finished product.

III. Hydro cracker unit (U300)

The refinement in the vacuum distillation unit still does not deliver the two most desired high quality oil products: motor gasoline and motor diesel. In order to still get these two products, a special hydro cracker plant was designed and installed. This is the 'Heart', the most expensive and most complicated part of the refinery.

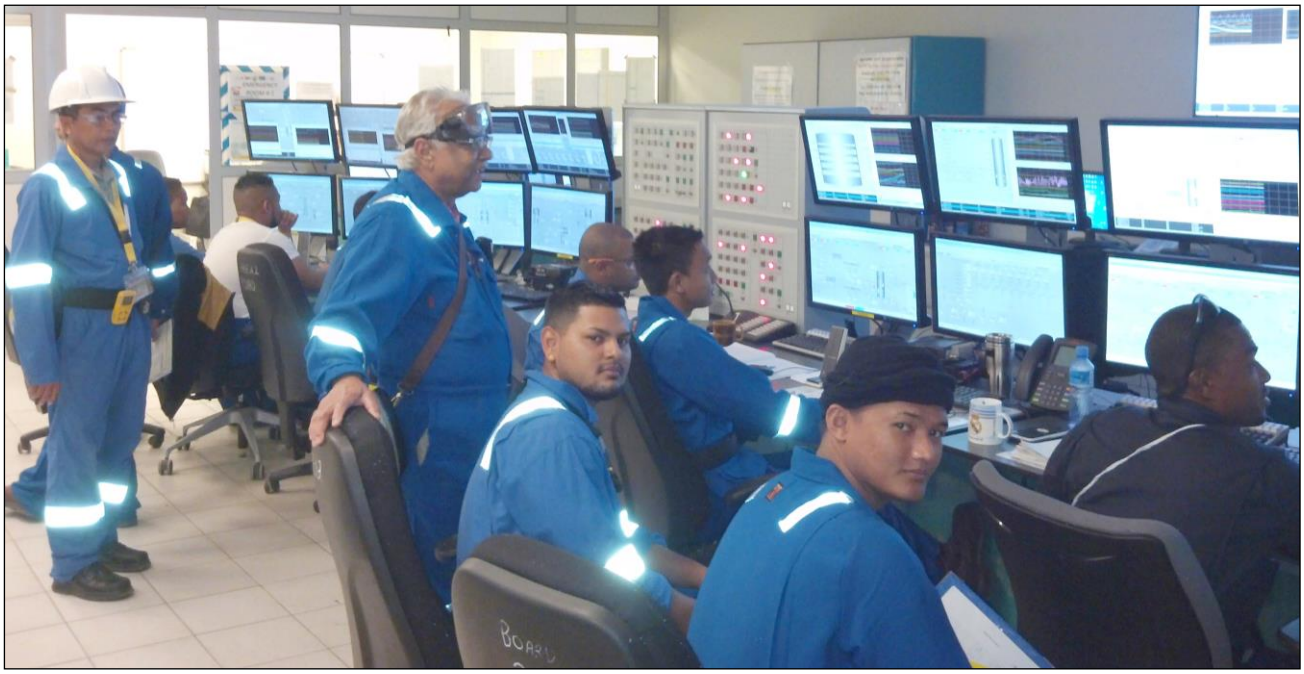
In the hydro cracker, under high pressure, high temperatures and with the addition of various chemical constituents, the light and heavy vacuum gas oil is refined further. Hydrogen is added in the hydro cracker and finally, premium diesel and nafta (a semi-product).

IV. The hydrogen unit (U-400)

The hydro cracker needs hydrogen to stabilize the refined light products. That is why a hydrogen plant U400 was built in which part of the heavy nafta (from the U500) is used to meet the need for hydrogen in the hydro cracker.

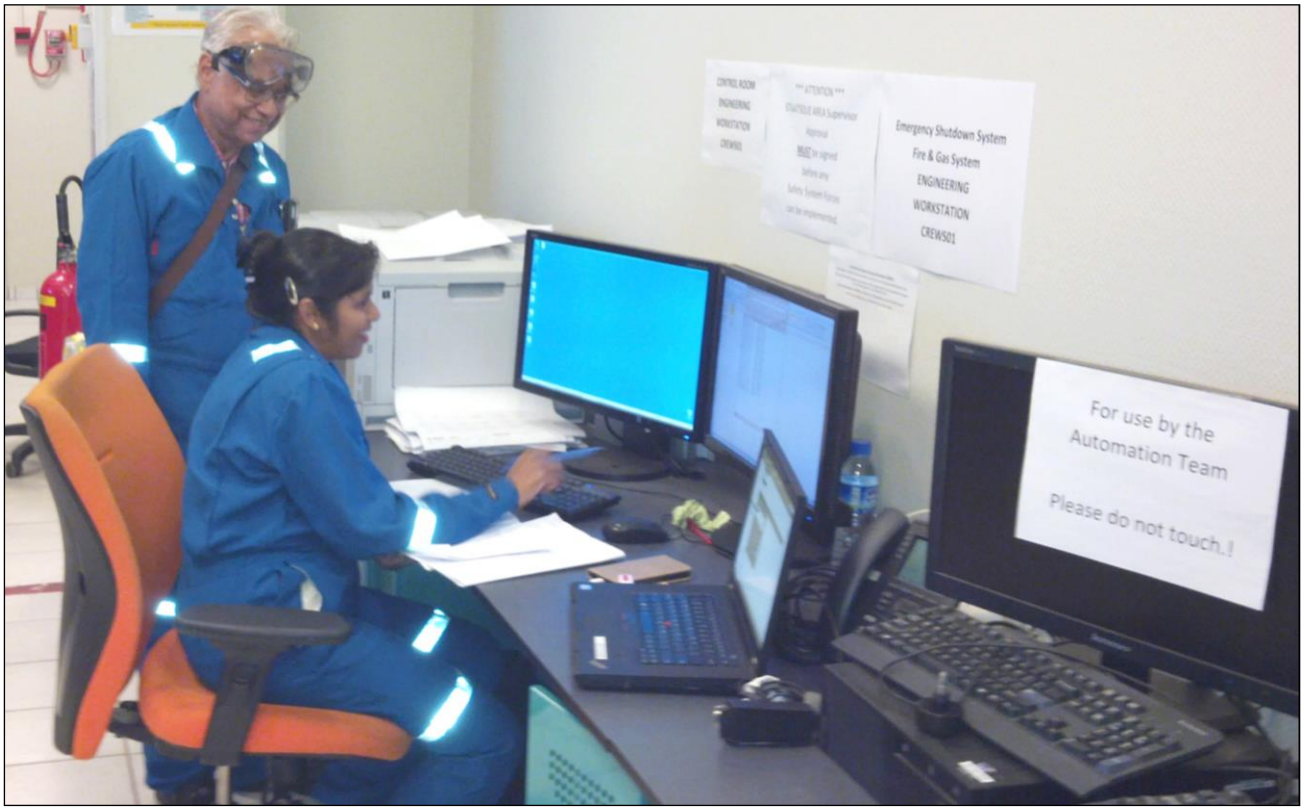
V. Nafta splitter (U-500)/Catalytic reformer (U-530)

In the nafta splitter, the nafta from the hydro cracker is separated in light and heavy nafta. The part of the heavy nafta which is not going to the hydrogen plant, at wordt in de Catalytic reformer conversed to premium motor gasoline. The light nafta does not need processing anymore and also goes in the premium gasoline-pool.



VI. Condensate refining and sulfuric acid production

The condensate, from the used stem for heating the process plants, is refined from pollutants in the condensate refining SWS (Sour Water Stripper- U-600). In the Amine Recovery plant (U-630), sulfuric acid is derived from the decomposing gases of the hydro cracker and in the Sulfuric Acid plant (U650), sulfuric acid for sale is produced with the extracted sulfur zwavel.



This refinery is very complicated and very integrated; if one unit is down, the whole plant will have to be shut down and started up again step by step after repairs. Depending which plant is down, the average start up time takes 1-2 weeks before production continues again.
Many teething problems have to be overcome, but I have met a very motivated group of proud (young) people there. They made me think of first years with Staatsolie. There is Confidence in Our Own Abilities and they must get the chance to prove it as well.
We can do it!