StatOil’s refinery in Kalundborg, Denmark, is benefiting from improved performance in its crude distillation unit (CDU) after a successful revamp. The revamp, carried out with help from Shell Global Solutions, has enabled StatOil to increase production in the light and heavy gasoil sections of the unit, and this has resulted in improved margins.

The unit had problems with flooding in the light gasoil-heavy gasoil separation section, and with draw off from the light gasoil section. “We were looking for a better separation and higher yields on light and heavy gasoil,” explains Poul Anders Larsen, senior process designer for StatOil’s Kalundborg refinery. “StatOil’s refinery in Mongstad, Norway, uses Shell Global Solutions as its technical adviser and has benefited from working with the organisation, so we decided to contact them.

“We achieved all of our objectives for the revamp. The light gasoil offtake has increased by at least 2%, and the heavy gasoil offtake by around 2 to 3%. We also have a much sharper separation between the fractions and are able to charge more feed to the vacuum tower. The overall margin improvements are of the order of $2 million,” concludes Larsen.

“Because StatOil has been able to increase the production of light gasoil, which is one of the main feed streams for automotive gasoil, it is increasing production of a higher value product,” says Alie Hoksberg, distillation technologist, Shell Global Solutions International BV. “The revamp has resulted in improved unit stability. And, because it is easier to optimise the unit when it is stable, the refinery can operate closer to its specifications. This means less product quality giveaway.”

Hoksberg explains: “Shell Global Solutions was approached after two previous revamp projects did not bring the expected benefits. StatOil carried out two dedicated test runs to provide operating data and product analysis. In addition, they carried out a gamma-ray scan of the column that indicated which sections were operating normally and which were flooding. This information enabled us to model the column to simulate the loading on each tray. We first analysed the causes of the problems and then came up with a solution – based on our extensive operational experience and understanding of distillation trays – that was developed into a basic design package for StatOil.”

The revamp involved adding more trays to the column. Larsen was surprised at this proposal, as it meant decreasing the amount of space between the trays: “Shell Global Solutions came up with a solution that we had not expected, but it is working well.”

Larsen is very happy with the support StatOil received. “Shell Global Solutions is not just a design company,” he says. “The organisation has a lot of practical experience as well, and we have benefited from this.”

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