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Twister™ - SEPARATING SHELL FROM THE COMPETITION



Twister™ is a new technology which was designed for the air-conditioning industry. Shell Technology E&P now developed it for use as a relatively cheap and efficient separator to remove liquids from gas - both natural gas and associated gas produced during the oil production process. Job Brouwer, Business Development Engineer for Twister™, explains how Twister™ works and defines its benefits for the Middle East. Salim Al-Sayid, Manager for Twister™ on secondment from PDO, also talks to Shell in the Middle East.

Development Oman (a company that is owned by the Omani Government, in which 5 per cent interest, is one of three foreign shareholders). Salim talks about the training he has received for the job whilst at PDO, the part he has played in the Twister™ project and the benefits gained from his involvement with Shell in this revolutionary technology...



"The idea for Twister™ originated in 1989 and was patented by a Dutch engineering and aerospace company based in The Netherlands. It is called Condi-Cyclone, which is short for CONverging and Diverging CYCLe. Job Brouwer, Business Development Engineer for Twister™ explains the concept.

"The idea was developed for drying air in air-conditioning applications. It was not found to be cost-effective in that industry. However, the idea was developed by Kees Tjeenk-Willink, who was working as a Chief Engineer for [Nederlandse Aardolie Maatschappij B.V.] in Groningen and who was the originator of the concept for the natural gas industry.

"He took the idea to Shell Technology E&P (STEP), and the company initiated a development programme. This led to the first field application of Twister™ as a natural gas separator in 1997, where it was tested in Zuiderveen in the north of The Netherlands. The test showed good results and proved that the concept worked in drying natural gas.

"When gas is produced, a certain amount of condensate and water is found within the gas. This has always been a problem to separate the condensate and water from the gas.

"Twister™ is a relatively simple process and entails the positioning of a tube of some two metres in length in the gas feed line. The inlet nozzle of the tube accelerates the gas to supersonic velocities. This acceleration results in a temperature drop of some 60 degrees centigrade. Because of this, a mist of tiny condensation droplets forms. Inside the tube, a delta-shaped wing creates lift and causes the liquid droplets within the gas to be thrown to the wall of the tube, where they are drained off.

"It is the effect created by the delta-shaped wing which literally twists the gas passing through it.

hence the name of the process.

Further testing took place to remove Natural Gas Liquids with a field testing unit which is Barendrecht. This unit is now being used by Shell Nigeria, a company which is involved in developing Nigeria's oil resources."

Job goes on to explain, "As part of the process of oil production, associated gases are produced at the same time, and traditionally these have been flared. However, in line with the Shell goal to reduce flaring and to eliminate it totally by 2008, Shell Nigeria are using the Twister™ to process the associated gas produced during oil production.

"If, as expected, this initial demonstration proves to be successful, then Twister™ will be used on a permanent basis in Nigeria. The clean associated gas will then be sent for liquefaction to a Natural Gas [LNG] plant which has been built recently on Bonny Island in Nigeria and which is owned by Shell.

"Twister™ is a simple technology and does not require any complicated systems, special equipment, which can be both expensive and maintenance intensive. Neither does it require associated regeneration systems, which have traditionally been used in the past for processing natural gas.

"As for its appeal for the Middle East," says Job, "Twister™ technology was exhibited at the Abu Dhabi International Petroleum Exhibition and Conference in 2000, where the concept drew a great deal of interest.

"The good thing for the Middle East is that Twister™ technology can be installed cheaply at remote locations, both in the desert and offshore, and used to reduce emissions in the processing of natural gas and oil.

"However, its main use in the Middle East will be for conditioning non-associated gas by removing water and Natural Gas Liquids in a single process step without the need for complex equipment. Furthermore, the Twister™ unit is a completely enclosed system with no emissions to the environment and can, because of its simplicity, be operated reliably in an un-manned mode.

He concludes, "As part of Shell's drive to commercialise certain technologies, the Twister™ is now being made available to a wider audience through a new venture called Twister™ B.V. This venture has share ownership of this venture with one or more venture capital groups, amongst which is Manhattan Bank.

"Any company which sees potential applications for Twister™ technology can get in touch with us at <http://www.twisterco.com/>. An initial screening can be done quickly and free of charge."



Salim Al Sibani is an Omani, and he was seconded to STEP from Twister™ venture from Petroleum Development Oman (PDO).

"I went to STEP from PDO in 1998 to work as Project Manager for the Twister™ project," says Salim. "My first assignment was to install the demonstration unit at Barendrecht in the north of The Netherlands. This demonstration unit has now become the first to prove that Twister™ technology really worked. It has now been installed at a plant in Nigeria for Shell Nigeria and will be used by Shell Nigeria to evaluate the suitability of Twister™ technology in processing its natural gas to meet export specifications."

"If successful, then Shell Nigeria may use Twister™ technology in a wide range of applications for the removal of water and Natural Gas Liquids from the associated gas it produces during oil operations."

Samin goes on to say, "Prior to my working on the Twister™ project, I was employed at the same time at PDO, I obtained a BSc in Mechanical Engineering and spent 10 years working as a Project Engineer in various postings, both in the field and at PDO's head office.

"Shell operates a scheme called Open Resourcing. It is an intranet-based system operating on the Wide Web and is, effectively, a notice board on which job opportunities, both within the Shell Group and its joint ventures, are posted. There were a number of other applicants for the job with Twister™ but I was selected because of my experience as a Project Manager with PDO.

"I have received a great deal of training from Shell over the years whilst working at PDO, where Shell staff visit PDO and hold training courses, and at the Shell training centre in The Hague. He says.

"These Shell courses have been very beneficial as they focus strongly on developing practical skills. They also facilitate the application of knowledge learned by putting theory into practice.

"One of the main advantages for me of having joined the Twister™ team is that it has provided me with the opportunity to be really involved, through hands-on experience, with a revolutionary new technology. I am also gaining experience on the commercial side as Twister™ is the first example of Shell commercialising some of its technology. So these new entrepreneurial approaches of Shell, both technological and in commercial terms, have provided me with the very best of both worlds. He concludes.

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