

KCA DEUTAG modular rig engineered for mobile European operations, tough environmental rules

IN MAY 2005, KCA DEUTAG inked a contract with OMV to drill deep and middle-range appraisal and exploration wells in the Vienna region of Austria. With a contract-specified spud date of May 2006, KCA DEUTAG put the project on fast track. In just weeks, it had set up a joint team with **Bentec Engineering** to design and construct a rig suitable for European operations.

Planning, construction and commissioning of the \$22 million T-208, a modular rig capable of both drilling and workover operations, spanned only 13 months, and the first well was spud on 30 May 2006, according to **Jan Mulder**, KCA DEUTAG drilling superintendent. The first well, named "Ebenthal (Tief 2/2a)," has a planned depth of 3,900 m. In drilling mode, the rig can drill up to about 5,000 m, and it can operate at up to 6,000 m in workovers.

POSITIVE EXPERIENCES

Before the T-208, KCA DEUTAG already had positive experiences with 2 modular rigs. In the mid-1980s, the company built its first modular rig, the 160 metric ton, 700-hp T-43. Then in the late '90s, the company built the T-2000, a 450 metric ton, 2,000-hp rig. That rig has been fully winterized and is currently operating in Russia.

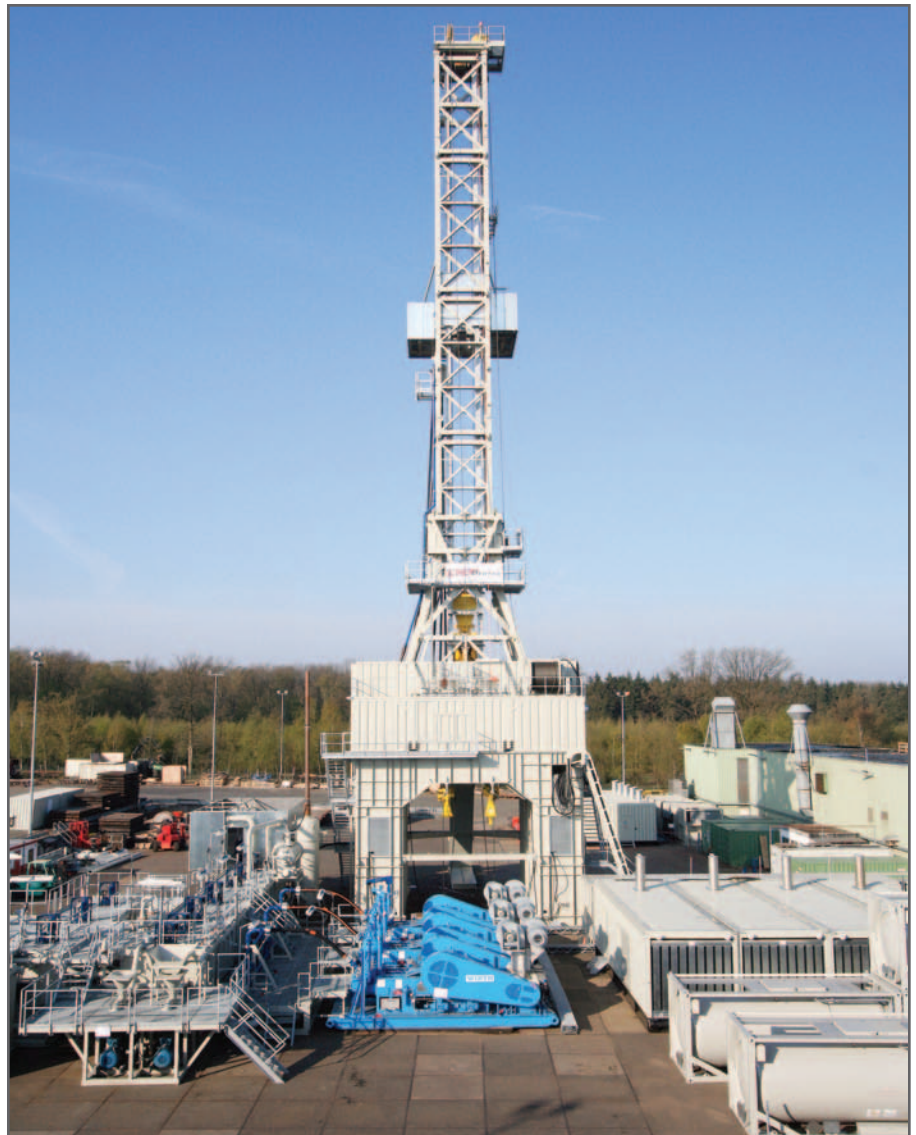
Both rigs have been successfully operational for many years, Mr Mulder said, providing strong confidence for the T-208. "Modular rigs is a proven design," he said.

DESIGN PRIORITIES

The KCA DEUTAG-Bentec engineering team listed several rig design priorities:

- Flexible operation for medium and deep well drilling and workover;
- Compact design for small locations;
- Reduced transport volumes suitable for European road rules;
- Equipment to enable performance drilling; and
- It must be conformed to ATEX standards.

Detail-engineering for the T-208 began on 30 May 2005, orders for major com-



KCA DEUTAG's modular rig T-208 was planned and constructed over a 13-month period. It was built specifically for European operations and is now drilling appraisal and exploration wells for OMV in Austria.

ponents were placed on 26 Aug, and fabrication of steel structures began by 20 Dec.

THE RIG

Among special features of the T-208 are:

- Containerized substructure with integrated equipment;
- Vertical mast erection;
- Gear-driven drawworks;
- ATEX-certified top drive;

- AC-drive technology;
- Modern drilling data acquisition system; and
- Safety items that include anti-collision system (ACS), iron roughneck, a 4Q system and parking disk brake, and a modern ergonomic driller's cabin with joystick-operated drawworks.

A top concern with the engineering team was the rig had to be flexible in its operations. Thus the modular T-208 allows several rig configurations that

can be changed depending on different well designs and operation types:

- 3 or 4 mast parts;
- 1 to 3 mud pumps;
- 3 to 4 generator sets;
- Reducing the substructure from 2 to 1 for drilling or workover;
- Reducing in the number of mud tanks; and
- The rig can be operated using the public power grid or with its own power supply with engines/generators.

COMPACT, EASY TO MOVE

Designed for small locations, the T-208 boasts a compact design that can reduce camp size by up to 30% compared with conventional rigs. The size of the location (internal area) depending on requirements varies from 1,600 sq m to 2,500 sq m.

It also has a box-on-box substructure that enables efficient rig moves on trucks. This can be particularly useful for European operations, where road load rules can be strict.

Rig highlights

- **Containerized substructure with integrated equipment**
- **Vertical mast erection**
- **Gear-driven drawworks**
- **ATEX-certified top drive**
- **Modern Caterpillar generators, Series 3512 with low emission**
- **Minimum sound emissions**
- **AC-drive technology**
- **Modern drilling data acquisition system**
- **Safety items: ACS, iron rough-neck, ergonomic driller's cabin with joystick-operated drawworks, 4Q system and parking disk brake.**

Since its modular design allows the rig to be taken apart into components, most load dimensions are limited to 25 metric tons or less, with dimensions of 120 m long by 255 m wide and 270 m tall. With these load sizes, transport permits are then needed for only drawworks (1 load), mud pumps (maximum 3 loads), VFD

container (1 load) and generator sets (maximum 4 loads).

In addition, its mast is made from 4 units, and its dimensions were reduced to fit road transport restrictions.

Wolfgang Mitschker, superintendent of drilling and workover for KCA DEUTAG's Austrian operations, estimates the complete rig move, including rig down, transport and rig up, can be done in 5-6 days. That compares with 8-10 days for a conventional rig.

OTHER FEATURES

Strict European environmental standards also were met with the rig's low emissions. The T-208 uses a new-generation engine, the **Caterpillar Series 3512**. This allows the rig to reduce NO_x by approximately 45% and fuel consumption by approximately 16%.

The rig is also completely sound-isolated to enable its use in urban areas.

The T-208's box-on-box substructure was ideal for sound isolation, Mr Mitschker said. "It's also good internally for our workers because it reduces noise internally," he explained.

The rig requires 1 driller and 5 rough-necks per shift. Because Austrian law doesn't allow 12-hour shifts, KCA DEUTAG has been operating in a continuous 8-hour shift system.

"We have had no problems with the operation or rig so far, OMV is very pleased with it, and our workers on the rig like the good working environment it provides, with its high level of automation," Mr Mitschker said.

The 3-year OMV contract carries two 1-year options, but KCA DEUTAG did not build the T-208 solely for this contract, Mr Mulder explained.

"The rig fits the contract very well, but we didn't completely design it just for this contract. Some parts of the rig were overdesigned for this project. We've got some spare volume and spare power," he said. "But we think that will be useful in other future European operations."

KCA DEUTAG currently has 17 newbuild rigs on order, with 2 of them being modular rigs with Bentec.

Finally, Mr Mulder emphasized that "in our complete project, we didn't have one single incident or accident. That's very significant." ♠