Caspian is one of today's most exciting frontiers

ONE OF THE LARGEST OIL discoveries in the past 30 years must still be proved commercial because of extreme operating, market and environmental challenges.

The Kashagan East well does show a world class accumulation, but it cost $800 million to drill and there is "still a question" whether the 80-km-long structure will be commercial.

That's how the venture was summed up by **Keith Dallard**, General Manager, **Offshore Kazakhstan International Operating Company** at the 2000 IADC Annual Meeting 27-29 Sept in Houston.

The OKIOC license covers the Kashagan, Karan, Aktote, Kashagan Southwest, and Kalamkas fields. To the west of the region onshore is Russia's huge Astrakan gas field; to the north is Karachaganak, also primarily a gas field.

Near the east side of the Caspian is the onshore Tengiz field, one of the top 5-6 structures in the world. Estimated recoverable reserves at Tengiz are 12 billion bbl.

Taken together, the region surrounding the Caspian Sea has enormous potential.

KASHAGAN DISCOVERY

In evaluating the find, OKIOC will look for similarities between Tengiz and the discovery well, said Mr Dallard. Both are pre-salt formations in the Devonian to Middle Carboniferous.

The Kashagan discovery penetrated a "significant oil column," he said. Fluid from the well is about 41 degrees API gravity and has a gas-oil ratio of about 3,000 scf/bbl.

Reservoir pressure is about 11,000 psi, said Mr Dallard.

A key challenge for development is the wellstream's estimated 16-17% hydrogen sulfide content.

Next steps in appraising the find will include use of a second rig for more drilling. This unit will be a land rig modified for installation on an island.

The next well will be 5-8 km away from the discovery. A Kashagan West well is now underway 38 km from the discovery.

"It was more expensive to drill the Kashagan discovery in 3 m of water than to drill a normal offshore well in 2,000 ft water depths."

—Keith Dallard, OKIOC

Also in the appraisal phase will be "a massive 3d seismic survey to find what happens between wells" as appraisal drilling and development proceed.

OKIOC wants to minimize the time to first oil delivery, "but we want to do that in a way that is consistent with good practice," said Mr Dallard.

DEVELOPMENT CHALLENGES

"It was more expensive to drill the Kashagan discovery in 3 m of water than to drill a normal offshore well in 2,000 ft water depths," said Mr. Dallard.

Even though the find appears to be a "world class accumulation," the development challenges are daunting. They center on these critical needs:

- Understand the very complex reservoir;
- Identify costs;
- Determine how to handle the well stream with its high pressure and high H_2S concentration;
- Confirm commerciality;
- Protect the fragile environment of the region.

"It will take a large commitment of resources," said Mr Dallard.

Oil will be the biggest source of revenue, he said, but the biggest challenges will be what to do with associated gas and sulfur.

"Gas management will be a critical element of the development plan," he said. Decisions must be made on whether to reinject or sell the gas, and when.

These decisions will have an impact on production facilities design. For instance, if the gas is to be reinjected, cleanup may be done offshore and islands will be needed for offshore production facilities. Onshore cleanup will mean a different approach to gas cleanup and production facilities design.

"This has not been decided yet," he said.

Then there is the sulfur.

At full production rates, the field possibly could produce 25-35% of the current world supply of sulfur, said Mr Dallard.

That will bring market challenges as well as operating challenges.

As far as oil shipment from the field is concerned, all options will be considered. But no decision has been made yet to support any one of the often-controversial approaches to oil shipment from the region.

In addition to considering existing options, "We may create some (options), too," said Mr Dallard.

There are many operating and facilities design challenges. Winter ice sheets exist in the region for 4-5 months each year. The design and fabrication capacity in the region is not well developed.

"These are recipes for surprise," said Mr Dallard.

Keys to successful frontier exploration drilling, he said, are proper HSE and technical standards, a clear scope of work and competence.

"The solutions lie with people, people, people."

Every phase of the project must be accomplished in a way that preserves the unique ecological system in and around the Caspian Sea.

That, too, will be a challenge to development.

It will be necessary, said Mr Dallard, "to create confidence in the region that development and the environment can thrive together."

"We're very excited to find a big field safely," he said. "Appraisal and confirming that the field is commercial now will be enormous challenges.

"But our goals are very like those of Kazakhstan. And teamwork among our partners—including Kazak officials and industry firms—will make it work." ■