

## Qatar's North Giant Field & Iran South Pars Gas Field

(Reference: Offshore Technology & RasGas)

### QATAR'S NORTH FIELD

THE NORTH FIELD IS THE LARGEST NON-ASSOCIATED NATURAL GAS FIELD IN THE WORLD, WITH RECOVERABLE RESERVES OF MORE THAN 900 TRILLION STANDARD CUBIC FEET OR APPROXIMATELY 10 PERCENT OF THE WORLD'S KNOWN RESERVES.



### The North Field

In 1971 exploration engineers discovered natural gas off the north-east coast of Qatar. At the time, however, no one knew quite how important the find was. Only after 15 appraisal wells had been drilled over a period of 14 years was it realised that the North Field, as it had been named, was one of the largest non-associated natural gas fields in the world, with recoverable reserves of more than 900 trillion standard cubic feet or approximately 10 percent of the world's known reserves.

This makes Qatar the world's largest holder of gas reserves after Russia and Iran. The North Field will supply gas to fulfill multiple large-scale renewable gas sales contracts for many decades to come.



## Iran Oil Industry

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To exploit this remarkable 6,000 square-kilometre field, Qatar Petroleum, the national company responsible for all oil and gas industry processes in Qatar, has built 14 LNG trains with a total production capacity of 77 million tons per annum. RasGas and its sister company, Qatargas, each operates seven of these LNG trains.

### South Pars, Iran

**Area:** 500 square miles

**Depth:** 3,000m below the seabed

**Water Depth:** 65m

**Total Field:** 436 trillion cubic feet

**Phases:** 30 phases

**Cost:** \$770m



Operator Petropars (NIOC Pension Fund 60%, Industrial Development and Renovation Organisation 40%)



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The Iranian South Pars field is the northern extension of Qatar's giant North Field. It covers an area of 500 square miles and is located 3,000m below the seabed at a water depth of 65m. The Iranian side accounts for 10% of the world's and 60% of Iran's total gas reserves. Iran's portion of the field contains an estimated 436 trillion cubic feet.

The field is planned to be developed in around 30 phases, each of which will require an initial investment of around \$1bn.

The first 12 phases of the development are underway and will have the capacity of one billion cubic feet and 40,000 barrels of condensate a day.

### **PHASE I**

The \$770m development is operated by Petropars (NIOC Pension Fund 60%, Industrial Development and Renovation Organization 40%). Around \$300m worth of contracts were signed with Samsung and Sadra. The utility facilities started operating in 2002 and the process facilities were operating by July 2003, giving a total output of one billion cubic feet of gas a day and 40,000bpd of gas condensates.

### **PHASES II AND III**

This \$2bn development came on stream in 2002. Two identical unmanned platforms, SPD 3 and SPD 4, were placed in 65m of water. Each platform receives gas from ten deviated wells, all within a radius of 3,000m. The platforms are linked to the onshore treatment system by two, 32in diameter, 105 km-long multiphase lines. It initially produced 13.5 million cubic feet of gas a day rising to 60 million cubic feet a day.

It will eventually be ramped up with the second and third phases of the project to an output of about two billion cubic feet of natural gas a day and 80,000bpd of condensates. The field is operated by TotalFinaElf (40%) on behalf of



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Petronas (30%) and Gazprom (30%). The project was officially inaugurated in February 2003.

### PHASES IV AND V

The development of the phases IV and V was awarded in 2000 to a consortium formed by Agip (60%) and Petropars (40%, on a buy-back basis). The project was officially inaugurated in April 2005 and is producing more than one billion cubic feet of sour gas a day. Iran's construction share of the project was more than 44%, equivalent to \$850m.

### PHASES VI TO VIII

These phases constitute a single project and are divided into onshore and offshore sections. The contract for this 2.65bn scheme was awarded to Petropars as the general contractor and the Pars Oil and Gas Company as the client in July 2000. The field was appraised by a three-well programme in 2001, estimating the field to contain three billion cubic feet of gas, 120,000 barrels of condensate and 3,300t of LPG a day.

**"The South Pars field is planned to be developed in around 30 phases."**

In December 2002, Statoil of Norway was named the operator of the offshore section on behalf of its Iranian partner Petropars, the operator for the land side of the development. Statoil has been responsible for building three production platforms for installation about 100km from land and has also laid a 31in pipeline from each platform to a gas treatment plant on the Iranian coast.

Condensate and LPG will be separated from the gas stream at the treatment plant and exported via a terminal nearby. The lean gas will then be transported through a 500km pipeline to the Agha Jari field for injection as pressure support to help maintain oil production.

The contract for fabrication and installation of jackets was awarded through an EPC contract to Iranian company ISOICO; the work was completed in January



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2004. The refinery project was awarded through an EPC contract in May 2002 to the TIJD consortium of Toyo of Japan, IDRO of Iran, JGC of Japan and Daelim of Korea.

In March 2008 the Iranian Oil Ministry said phases VI to VIII would come on stream during the next Iranian Year, which started on 20 March, and production is expected to run at about 4,500t of LPG and about 160,000barrels of condensate a day.

### **PHASES IX AND X**

The contracts for these phases were signed in September 2002 with a consortium of LG Korea, OIEC (Oil Industries Engineering and Construction) company of Iran and IOEC (Iranian Offshore Engineering and Construction Company) and represent an investment value of more than 2bn.

As with phases VI to VIII, phases IX and X are expected to come on stream in the year beginning 20 March 2008, and are expected to produce 25 million cubic metres of gas a day, 1,500t of butane and propane (LPG 40), 1,000barrels of gas condensate and 1,350t of ethane a day.

### **PHASES XI AND XII**

Phase XI will produce sour gas for the Pars LNG plant. The contract for this phase has gone to Total and Petronas, although delays forced the Iranian Oil Ministry to issue an ultimatum to Total in April 2008 to commit to the deal by the June or the contract would go to a rival.

Phase XII is designed to yield a daily production of 84 million cubic metres of gas. The first of three jackets for the wellhead platforms will be ready to be rolled up by mid-May 2008. The contract for developing this phase was given to Petropars in mid-2005, and the IOEC has also concluded a contract with the POGC, valued at 745m, for laying the offshore pipelines. Another contract



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worth 386m has been signed with the IOEC for building the marine platforms for this phase.

"The South Pars oil and gas field covers an area of 500 square miles and is located 3,000m below the seabed."

### PHASES XIII TO XVIII

Phases XIII and XIV are dedicated to the Persian LNG project, and are a joint development between the NIOC, Shell and Repsol. They are scheduled to come on stream in 2012, each producing eight million tons of LNG a year.

Again though, in April 2008, delays in proceeding with development of these phases forced the Iranian Oil Ministry to issue an ultimatum to Shell to commit to the deal by the June or risk losing the contract.

Development for phases XV and XVI has been awarded to a consortium of Aker Kvaerner, of Norway, and Iranian companies Ghorb and Sadra. These phases are designed to produce about 50,000,000m of natural gas a day for domestic consumption plus one million tons of LPG a year for export. The cost of these two phases will be 2bn and they are expected to start production in 2012.

Development for phases XVII and XVIII has been assigned to a consortium consisting of OIEC, IOEC and Petropars. These phases are expected to produce about 50,000,000m of gas and 11,000,000m of condensates a day when they come on stream, also scheduled for 2012.