

OIL AND GAS FIELDS IN NORWAY

INDUSTRIAL HERITAGE PLAN



NORSK OLJEMUSEUM

THE ULA AREA

The Ula area embraces the Ula, Tambar, Blane and Oselvar fields. Blane, which straddles the UK-Norwegian median line, was the second field to be developed after Britain and Norway signed a frame agreement on cross-border petroleum collaboration in 2005.

Ula

BP farmed into production licence 019 in 1976 under an agreement with Conoco/Pelican. That allowed the UK oil major, which had not been represented on the NCS earlier, to acquire two-thirds of the licence for blocks 7/12 and 2/1 in exchange for drilling two exploration wells in this acreage without cost to the sellers and within the deadlines specified by the government. Conoco as operator planned and drilled the first well. This 7/12-2 well encountered oil at a depth of 3 378 metres, only 70 metres below the point where Gulf had terminated an exploration well in 1968. The latter had penetrated some distance into the 120-metre thick stratigraphic

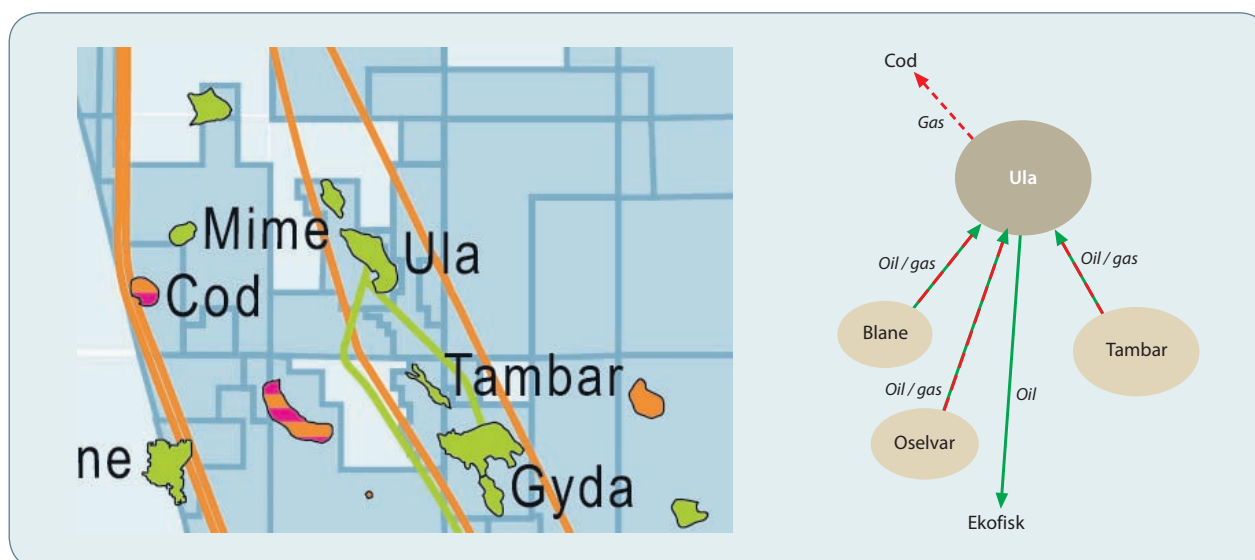


series of late Jurassic shales which later proved to be the cap rock on Ula.

With 70 per cent of the licence, BP naturally took over the operatorship and the principal responsibility for the subsequent Ula development.

Reservoir and recovery strategy

The main reservoir lies in late Jurassic sandstones





The Ula field. From left: the QP quarters, DP drilling and PP processing platforms. Photo: BP Norge

deposited in a shallow marine environment. Permeability varies from good to very good, but declines towards the flanks.

Ula produced originally through pressure reduction, but water injection was adopted after a few years to improve recovery. Water alternating gas (WAG) injection began in 1998. Since supplies of gas were boosted by processing Tambar production on Ula, the WAG programme has been expanded. All gas is injected back into the reservoir to improve oil recovery.

Transport

Crude is carried in the Ula oil pipeline to the Ekofisk centre and on through Norpipe to Teesside. The Ula gas transport line ran to Ekofisk via Cod, but ceased operation in 1998.

Development solution

Ula has been developed with three installations tied together by bridges – the QP quarters, DP drilling and PP processing platforms. DP has eight wells for production and six for water injection. PP carries

equipment for separation, compression and water injection.

Ula

Block	7/12
Production licences	019 and 019 B
Awarded	1965 and 1977
Total recoverable reserves	550 mill bbl oil 3.9 bn scm gas 3.3 mill tonnes NGL
Remaining at 31 Dec 2008	115 mill bbl oil 0.8 mill tonnes NGL
Discovery year	1976
Approved for development	30 May 1980
On stream	6 Oct 1986
Operator	BP Norge
Operations organisation	Stavanger
Main supply base	Tananger
Licensees	
BP Norge	80%
Dong E&P Norge	20%

Tambar

Proven in 1983, Tambar lies in 68 metres of water about 16 kilometres south-east of Ula and roughly 12 north-west of Gyda. The field is close to the UK-Norwegian median line, but all its reserves are on Norway’s side.

Reservoir and recovery strategy

The reservoir lies 4 100-4 200 metres down and comprises sandstones in the Ula formation deposited in a shallow marine environment during the

late Jurassic. Its properties vary, and it is divided into zones by sand quality.

Three wells have been drilled, which produce through pressure reduction and limited natural water drive.

Transport

Production is piped to Ula, with the oil separated out and exported by pipeline via Ekofisk to Teesside while the gas is injected into the Ula reservoir to improve recovery.

Development solution

The Tambar platform is a simple steel wellhead structure tied back to Ula, and has no processing facilities. Without permanent staffing, it is remotely operated from Ula. The latter provides power through a submarine cable.

Tambar	
Blocks	1/3 and 2/1
Production licences	019 B and 065
Awarded	1977 and 1981
Total recoverable reserves	61 mill bbl oil 2.6 bn scm gas 0.3 mill tonnes NGL
Remaining at 31 Dec 2008	10.7 mill bbl oil 2.6 bn scm gas 0.1 mill tonnes NGL
Discovery year	1983
Approved for development	3 Apr 2000
On stream	15 Jul 2001
Operator	BP Norge
Operations organisation	Stavanger
Main supply base	Tananger
Licensees	
BP Norge	55%
Dong E&P Norge	45%



The Tambar platform. Photo: BP Norge

Tambar East

Reservoir and recovery strategy

The Tambar East reservoir lies 4 050-4 200 metres deep and comprises late Jurassic sandstones deposited in a shallow marine environment. Reservoir quality varies. The field is produced through pressure reduction and limited natural water drive.

Transport

Production is piped via Tambar to Ula for processing, with the oil exported through the existing pipeline system via Ekofisk to Teesside. The gas is injected into the Ula reservoir to improve recovery.

Development solution

Tambar East has been developed with a production well drilled from Tambar.

Blane

This oil field straddles the UK-Norwegian boundary, with 18 per cent lying in Norway's sector and 82 per cent on the British side. It lies close to Ula in block 1/2 in the Norwegian sector, and in UK block 30-03a. Production licence 143 BS covers Norway's part of the field, which was discovered in 1992 with well 1/2-1. Well 30/31-1 confirmed the find on the UK side in the same year. Development plans for Blane were approved in 2005 by the British and Norwegian authorities, and production began in September 2007. The operators are Talisman Energy Norge for PL 143 and Talisman Energy (UK) in Britain's P.111 licence.

Reservoir and recovery strategy

The reservoir comprises marine sandstones of Palaeocene age.

Produced water from Blane, Ula and Tambar is blended on Ula and injected to maintain pressure in Blane. Gas lift could also be relevant after processing capacity on Ula has been upgraded.

Transport

The wellstream is piped to Ula for processing and metering, with oil exported by pipeline to Teesside and the gas sold to Ula for injection in its reservoir.

Blane

Blocks	30-03a (UK) and 1/2
Production licence	143 BS
Awarded	2003

Total recoverable reserves	32 mill bbl oil
Norwegian share	5 mill bbl oil
Remaining at 31 Dec 2008	4.4 mill bbl oil

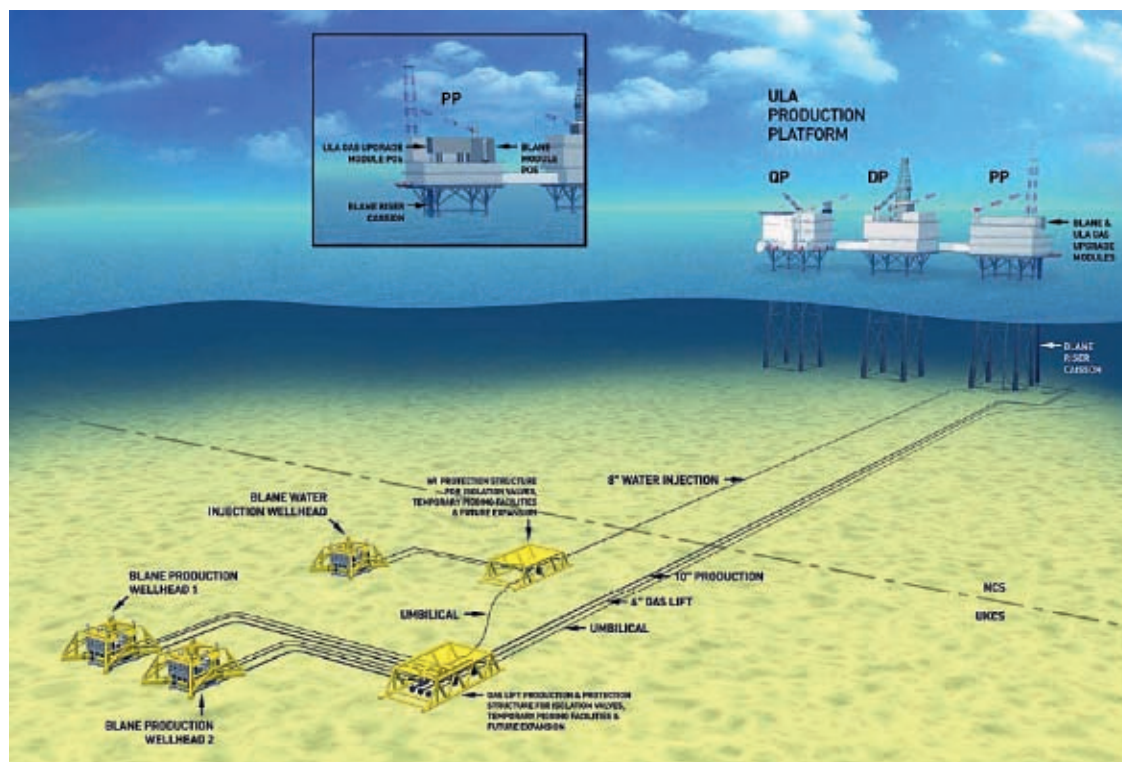
Discovery year	1989
Approved for development	1 Jul 2005
On stream	12 Sep 2007
Operator	Talisman Energy

Licensees

Talisman North Sea	25.00%
Talisman Energy Norge	18.00%
Moc Exploration (UK)	13.99%
Eni UK	13.90%
Roc Oil (GB)	12.50%
Bow Valley Petroleum (UK)	12.50%
Eni ULX	4.11%

Development solution

Blane has been developed with subsea installations located in the UK sector and tied back to Ula. Three subsea wells have been drilled.



Blane's subsea installations in the UK sector, with pipelines to Ula. Illustration: Talisman Energy Norge

Oselvar

The PDO for Oselvar was approved by the government on 19 June 2009. Proven in 1991, this oil and gas field lies 21 kilometres south-west of Ula in 70 metres of water. The reservoir is 2 900-3 250 metres down. Operated by Dong Norge, Oselvar will be developed with a subsea solution involving four well slots tied back to Ula for wellstream processing. The oil will be piped to Ekofisk, with the gas processed and purchased by the Ula licence for injection in that field. Oselvar gas forms part of plans for further development of water alternating gas (X-WAG) injection, and has the potential to double production from Ula over the next 10 years.

Approval of the Oselvar PDO establishes Ula as an area centre for several fields at the southern end of the NCS. The project is a good example of the way small discoveries close to existing fields can be developed with good profitability. It also helps to

Oselvar

Production licence	274
Awarded	2002
Recoverable reserves	27.6 mill bbl oil 4.8 bn scm gas
Discovery year	1991
Approved for development	19 June 2009
Operator	Dong E&P Norge

Licensees

Dong E&P Norge	55%
Bayerngas Produksjon Norge	30%
Norwegian Energy Company	15%

extend the producing life of Ula by exploiting capacity there. Originally due to produce for 10 years, Ula could remain on stream until 2040. Plans call for Oselvar to begin production in November 2011.

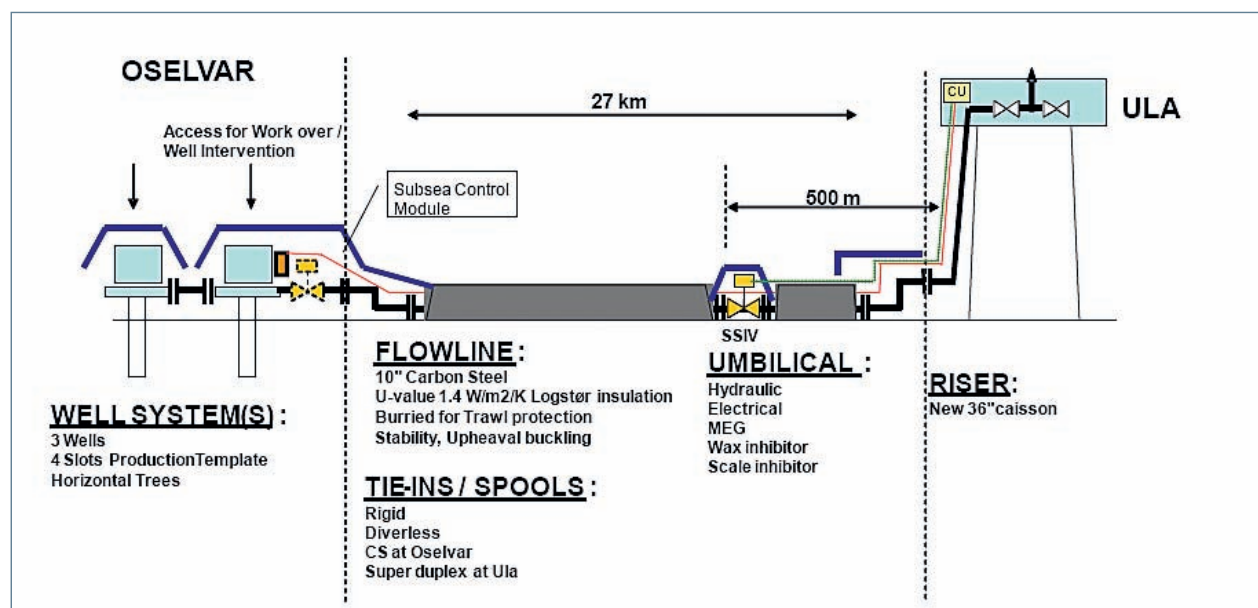


Diagram of the Oselvar development concept. Illustration: Dong E&P Norge AS