

# OIL AND GAS FIELDS IN NORWAY

## INDUSTRIAL HERITAGE PLAN



NORSK OLJEMUSEUM



# DRAUGEN

This oil field lies in about 250 metres of water in block 6407/9 on the Halten Bank, roughly 150 kilometres north of Kristiansund. It was proven in 1984.

Draugen came on stream in October 1993 as the first field to begin production north of the 62nd parallel, and its opening accordingly represented a milestone in Norwegian oil history. The operator is Norske Shell.

## Reservoir and recovery strategy

The main reservoir is built up from sandstones in the late Jurassic Rogn formation. Relatively homogeneous, it has good production characteristics. The structure is also very flat and covers a large area. Garn West and Rogn South are two separate oil zones in the reservoir.

Draugen is produced with the aid of pressure support from water injection. Downhole equipment for gas lift is in use.

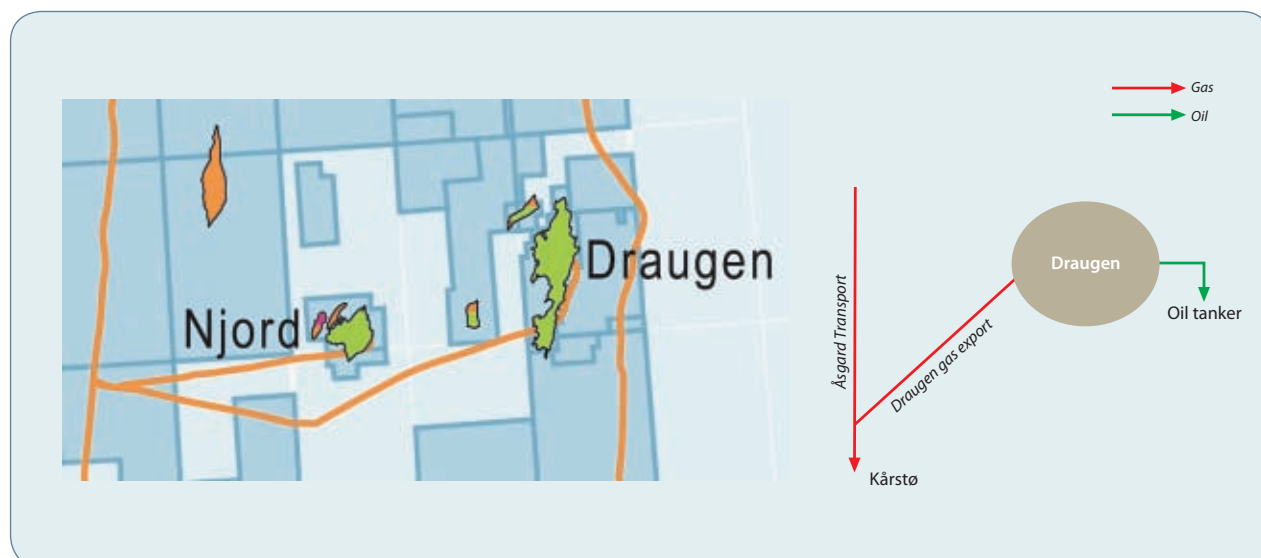
Efforts to increase and extend production have been under way ever since the field came on stream. Extensive use of 4D seismic surveys has been made regularly to map the area. This has yielded valuable



information on field and how the oil moves in the reservoir. At the same time, the 4D surveys help to determine where new wells should be placed.

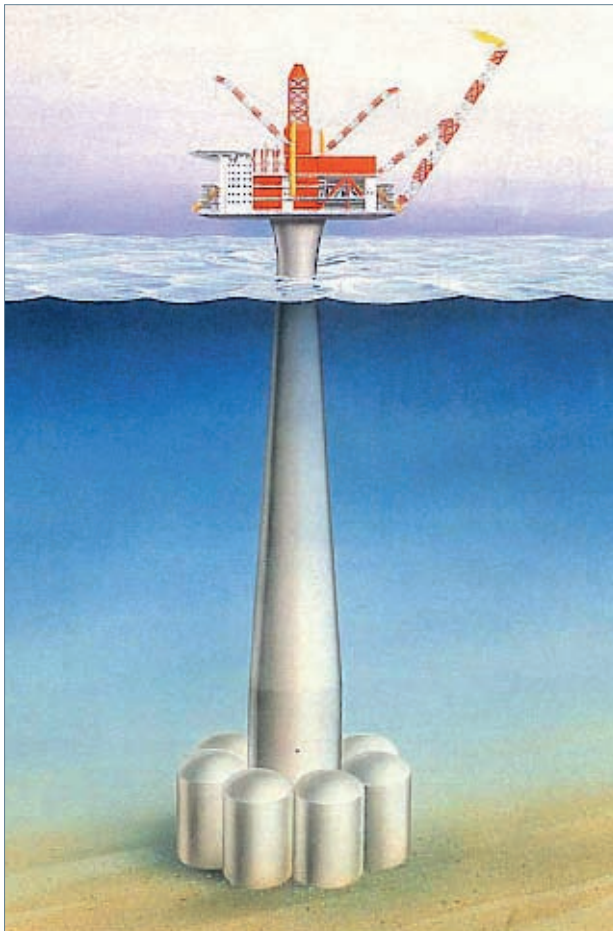
## Transport

Oil is exported via a floating loading buoy, with associated gas delivered through Åsgard Transport to Kårstø.





*The Draugen platform. Photo: Heine Schølberg/Norske Shell*



*The Draugen platform. Illustration: Norwegian Contractors*

### **Development solution**

An integrated production, drilling and quarters installation, the Draugen platform is supported on a concrete GBS built by Norwegian Contractors. This structure is the only Condeep built with a single shaft – known as a monotower. The platform was installed in 1993.

Draugen's peak output was about 225 000 b/d of oil. When the field was developed, an average production of roughly 90 000 b/d was planned, but both reservoir and platform proved capable of higher levels.

The associated gas is transported to Kårstø through the Draugen gas export pipeline via a tie-in to the Åsgard Transport system, which became operational in October 2000. Gas exports in 2008 totalled some 500 000 scm/d.

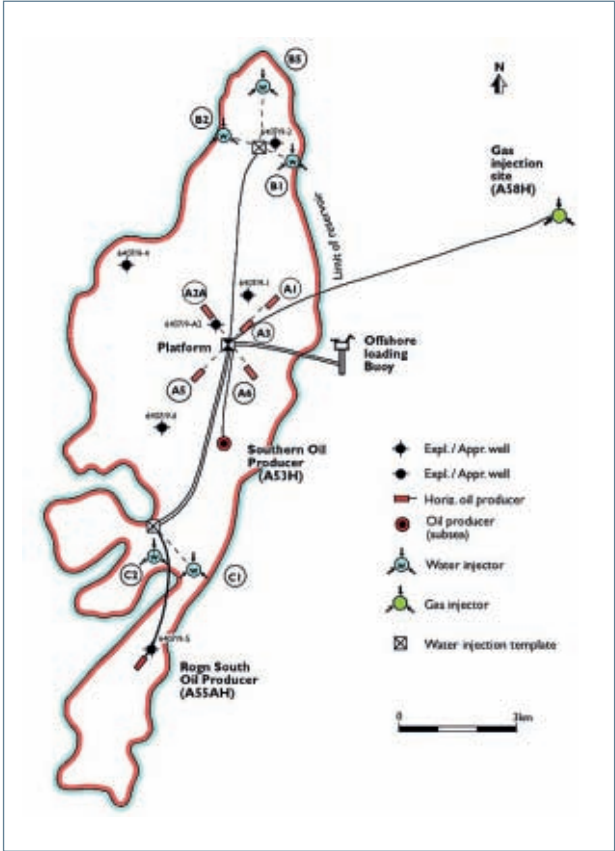
Oil from Draugen is produced from a total of 13 wells, including six horizontal ones drilled from the platform and seven subsea completions.

Intermediate oil storage is provided in seven cells grouped around the base of the concrete shaft, with loading into shuttle tankers via the Draugen floating loading platform (FLP). The latter stands about three kilometres east of the production installation.

Garn West and Rogn South

Garn West was developed in 2001 with two subsea wells and a 3.3-kilometre pipeline to the Draugen platform. A supplementary well was drilled in 2008. Two subsea wells drilled on Rogn South, a separate

area at the southern end of Draugen, came on stream in November 2002 and are tied back to the field platform via Garn West. A supplementary well was drilled and brought on stream in the summer of 2008.



The Draugen field. Illustration: Norske Shell

|                            |   |
|----------------------------|---|
| <b>Draugen</b>             |   |
| Block                      | 6407/9  |
| Production licence         | 093   |
| Awarded                    | 1984  |
|                            |   |
| Total recoverable reserves | 900 mill bbl oil<br>1.5 bn scm gas<br>2.4 mill tonnes NGL   |
| Remaining at 31 Dec 2008   | 133.3 mill bbl oil<br>0.1 bn scm gas<br>0.4 mill tonnes NGL |
|                            |   |
| Discovery year             | 1984  |
| Approved for development   | 19 Dec 1988   |
| On stream                  | 19 Oct 1993   |
| Operator                   | Norske Shell  |
| Operations organisation    | Kristiansund  |
| Main supply base           | Kristiansund  |
|                            |   |
| <b>Licensees</b>           |   |
| Norske Shell               | 26.20%  |
| Petoro                     | 47.88%  |
| BP Norge                   | 18.36%  |
| Chevron Norge              | 7.56%   |