



Small "twisted tower" platforms for the Halfdan field.



Your reliable engineering partner---

Rambøll Oil & Gas is one of the international divisions of the Rambøll Group comprising more than 4,200 employees in over 140 permanent and project offices all over the world providing engineering services on a worldwide basis.

With more than 25 years of experience, Rambøll's Oil & Gas division provides all types of engineering consultancy with onshore and offshore production facilities ranging from project identification and feasibility studies to design, procurement, commissioning and, eventually, decommissioning.

DENMARK
Esbjerg
Rambøll Oil & Gas
Tel.: +45 7913 7100
oil-gas@ramboll.dk
www.ramboll.com/oil-gas

Copenhagen
Rambøll Oil & Gas
Tel.: +45 4598 6000
oil-gas@ramboll.dk
www.ramboll.com/oil-gas

NORWAY
Sandefjord
Rambøll Future as
Tel.: +47 3348 7800
oil-gas@ramboll-future.no
www.future.as

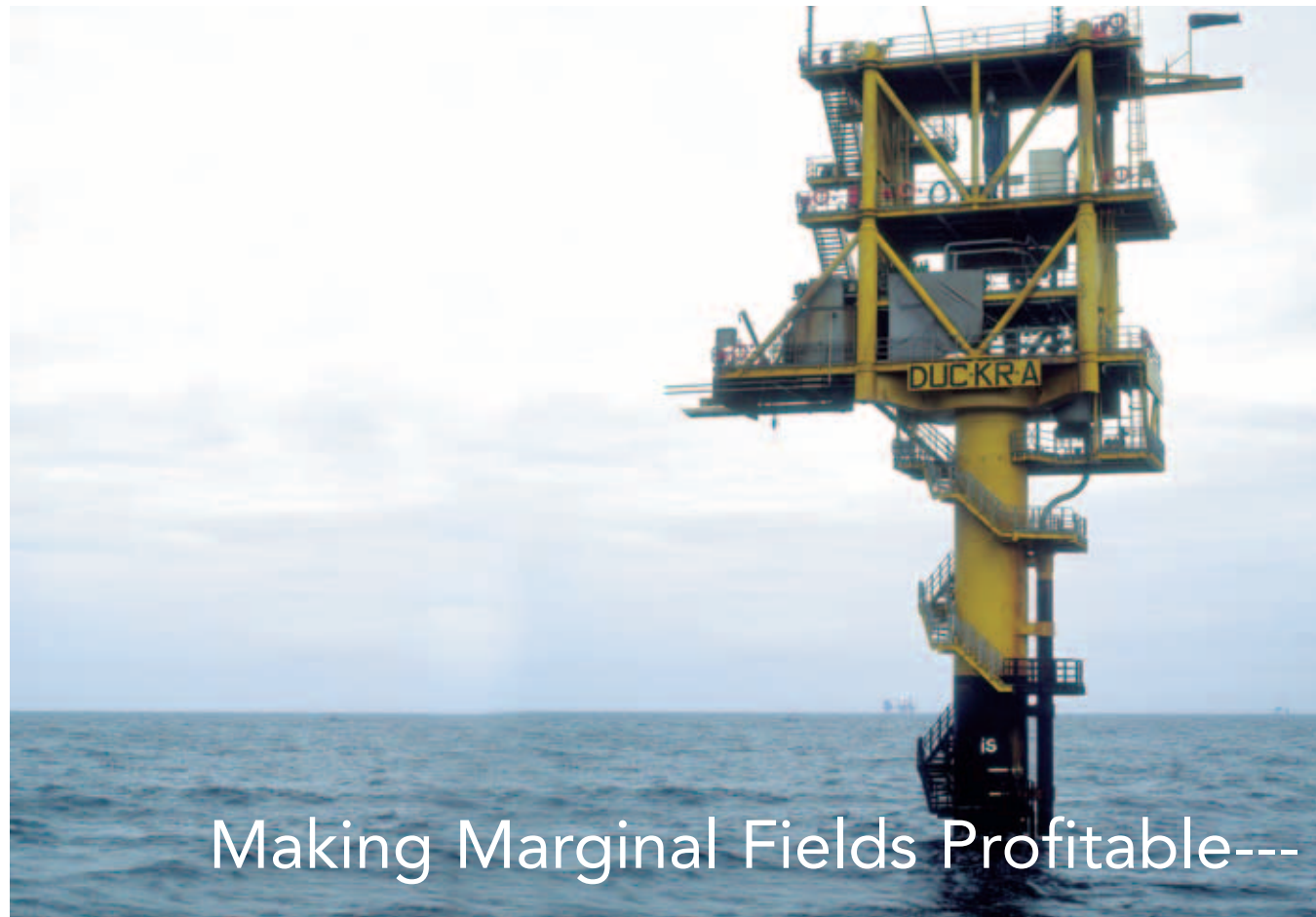
Stavanger
Rambøll Future as
Tel.: +47 9942 8100
oil-gas@ramboll-future.no
www.future.as

QATAR
Doha
Rambøll Qatar A/S
Tel.: +974 4360 789
ramboll@qatar.net.qa
www.ramboll.com/oil-gas

COP50 A/S



Platforms for Marginal Fields---



One of the earliest mono-column platforms, Kraka.

If your challenge is to make a marginal field profitable, Rambøll is offering you the tool.

As most of the oil and gas in the Danish sector of the North Sea is tied in relatively small and complicated reservoirs, Rambøll successfully took up the challenge of developing and designing a platform offering an attractive cost/benefit solution to operators in such adverse environments.

Since 1989, 15 Rambøll designed mono-column platforms have been installed in the North Sea and the Arabian Gulf, making marginal fields profitable fields.

The mono-column concept

The Rambøll mono-column platform is designed to minimize installation costs by using few and simple structural elements and optimizing structures and facilities.

In order to keep the platform cost-effective, low-weight, easy to fabricate and able to withstand the harsh environment of the North Sea, components exposed to wave loads are minimized. To achieve this, the wells of the mono-column are placed in a circle relatively close to each other offering easy access while at the same time reducing wave loads on the structure, as the conductors are enclosed in the column.

Cover: Cecilie, small platform containing 10 wells.

The Rambøll mono-column platform offers a number of other advantages, such as:

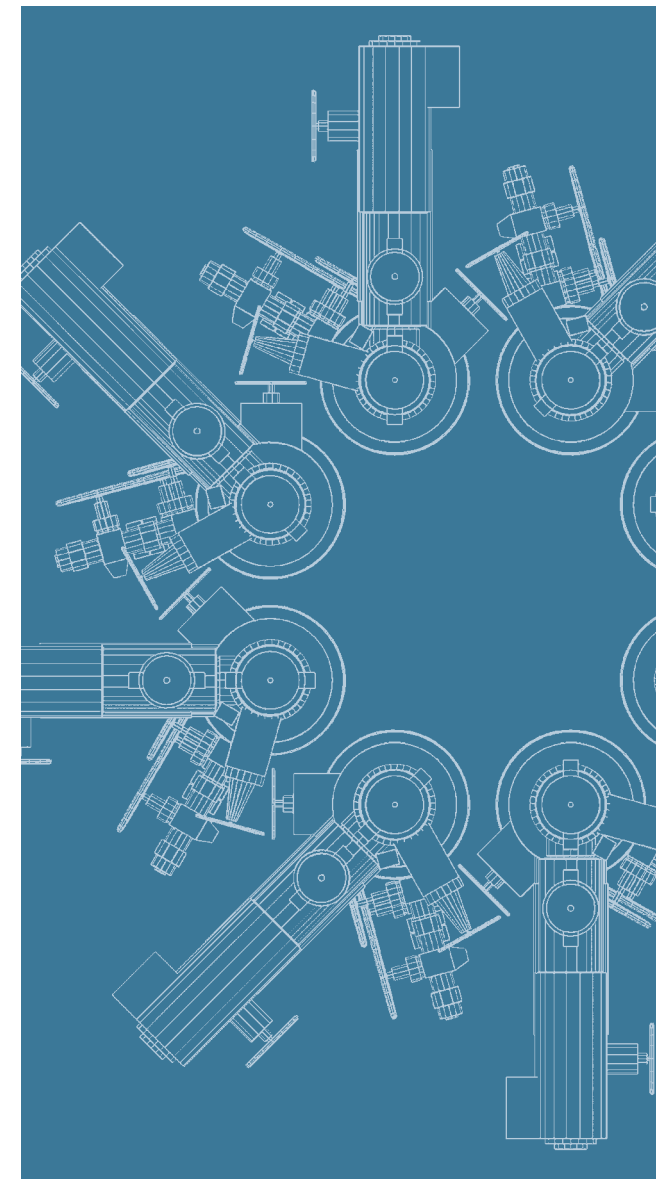
- easy fabrication, handling, transport and installation
- limited weight
- reduced time for inspection and maintenance

Minimum topsides

The philosophy behind small and cost-effective, unmanned platform solutions is to eliminate all process facilities that are not required for transfer of well stream to the pipeline, in a manner maintaining the safety of the personnel servicing the platform.

The platform concept is, furthermore, characterised by the following:

- the number of process and utility components is kept at a minimum, requiring little maintenance
- the inventory of hazardous material is kept at a minimum, thereby preventing ignited releases from harming the platform
- in case of large releases such as blowouts, personnel visiting the platform will evacuate immediately
- hand held fire fighting equipment and self contained units are used, instead of a firewater system
- an integrated central/F&G/ESD system is remotely controlled from the host platform
- the platform is only manned in calm weather and in daylight



Wellhead arrangement on mono-column platform.

Rambøll's know-how leading to your success

The Rambøll mono-column concept is a result of the multi-disciplinary skill and expertise characterizing the core competences of the Rambøll Oil & Gas Division. Here solid engineering know-how is combined with the in-house resources of highly skilled specialists within disciplines such as HSE&Q, soil engineering, software development, management and financial consultancy.

Based on our extensive experience with marginal as well as more conventional fields, Rambøll is carrying out assessment of all stages of the life cycle of a platform - from initial feasibility study through detailed design and commissioning to final decommissioning.



The South East Tyra mono-column under commissioning.

Rambøll is able to offer:

- feasibility studies including cost estimates
- front-end studies including life cycle costs and risk assessment
- detailed design of topsides and jacket including dynamic analyses
- planning of transportation, lifting, and installation
- re-assessment and modification
- decommissioning in a manner that equally takes technical and environmental aspects into consideration

More than 25 years in the offshore industry provides Rambøll with extensive experience and know-how of all project stages - regardless the size of a project. The large organisation of consulting engineers backing up Rambøll Oil & Gas ensures our ability to offer the right engineering solutions focusing on the interest of the client during all stages of the project.

Your success is our best reference---