

The Condeep platforms – and the leaning tower at Hinna

A short summary of some important events in
a bygone era in Stavanger

It started with a challenge, a good concept and some determined contractors ---

Jan Moksnes Eks NC

Stavanger became the oil capital

Oil was first discovered in the North Sea in the late 1960's. In the Norwegian sector Ekofisk was the first major find (1969).

In 1972 OD and Statoil were established with head offices in Stavanger. Gradually the oil companies arrived and so did many suppliers of goods and services, encouraged and supported by the City Council.

Since 1970 the population of Stavanger has increased by 80% and the city has got university, shopping malls, indoor sports arenas, Michelin restaurants, concert hall, oil museum, underwater tunnels - - -



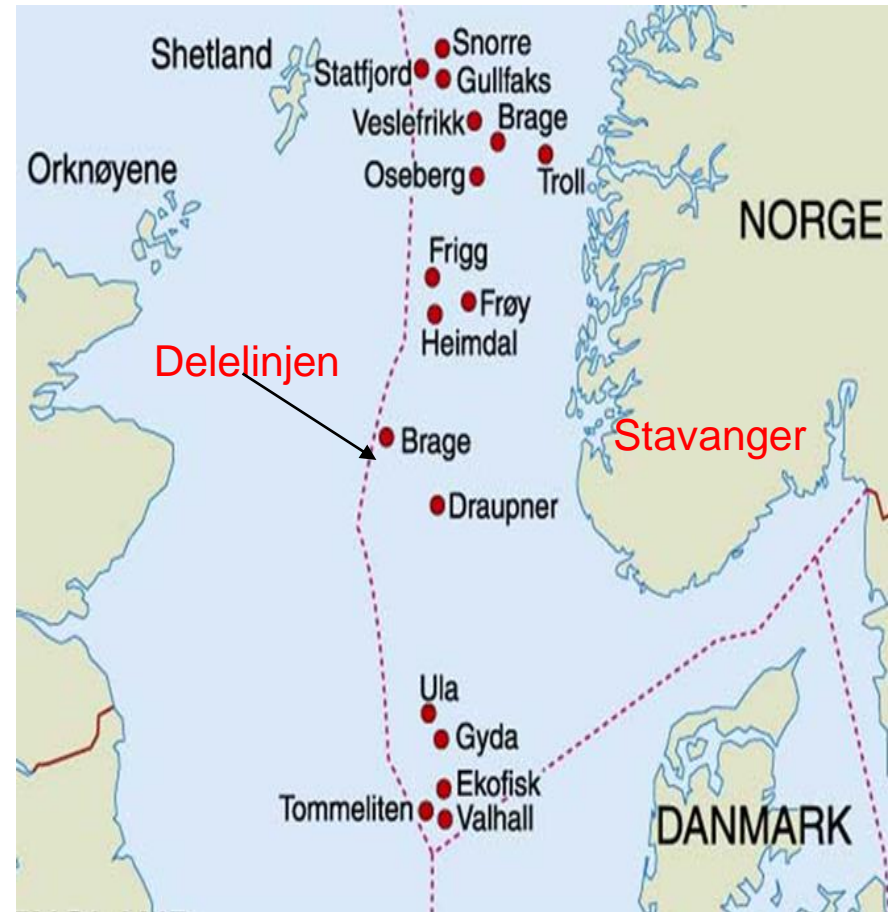
The North Sea – a new arena with new challenges

Discoveries of oil and gas in a very hostile marine environment

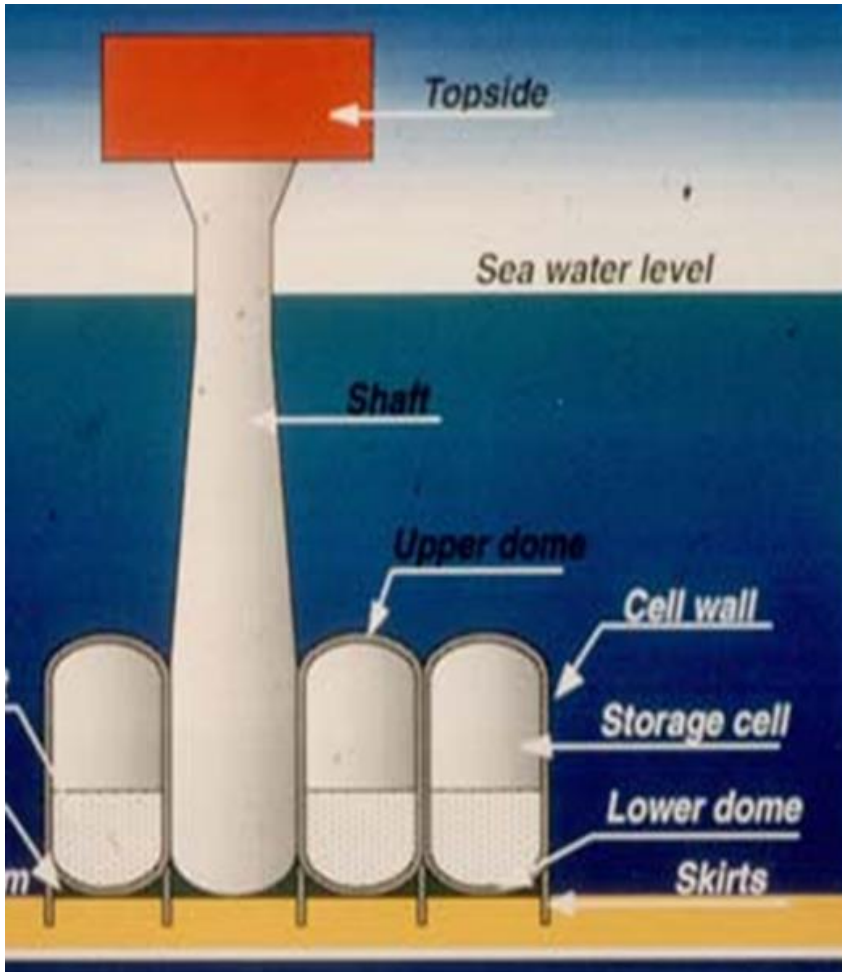
- Water depths up to 300 m
- Wave heights up to 30 m
- Oil fields up to 200 km from shore

A new scenario with international operators demanding **robust solutions and rapid deliveries.**

*Note the position of **delelinjen** and of **Stavanger** on the North Sea map*



Condeep – a smart new concept in 1973



- Shell structure
- Strong and durable materials
- Oil storage
- Supporting heavy topside
- Inshore completion
- Quick delivery on **EPC** contract

Developed by NC with support from Dr.techn. Olav Olsen, NGI, NTNU and others

Concrete entered a steel minded industry

The Doris designed **Ekofisk** oil storage caisson (Phillips) was the first concrete project. Built by NC in Stavanger 1971/73. Another Doris platform **Frigg CDP1** (Elf) was built by NC in Åndalsnes 1973/75.



The **Condeep** break through came in the UK with **Beryl A** (Mobil) in July 1973, followed 4 weeks later by **Brent B** (Shell). Contracts for **Brent D** (Shell) and **Statfjord A** (Mobil) followed in 1974. All markedet, designed and built by the Condeep Group (NC + Aker).



& Aker Group

The pioneer: Beryl A Condeep 1973-1975



Tow out from **Norwegian Contractors** dry dock at Hinna in May 1974.

Ready for tow out to sea 1975.
Topside built in parallel with
the base and delivered by **Aker**

Oil field 315 km NE of Aberdeen

- Water depth 118 m
- Construction time 20 months
- EPC and fixed price
- On site on time

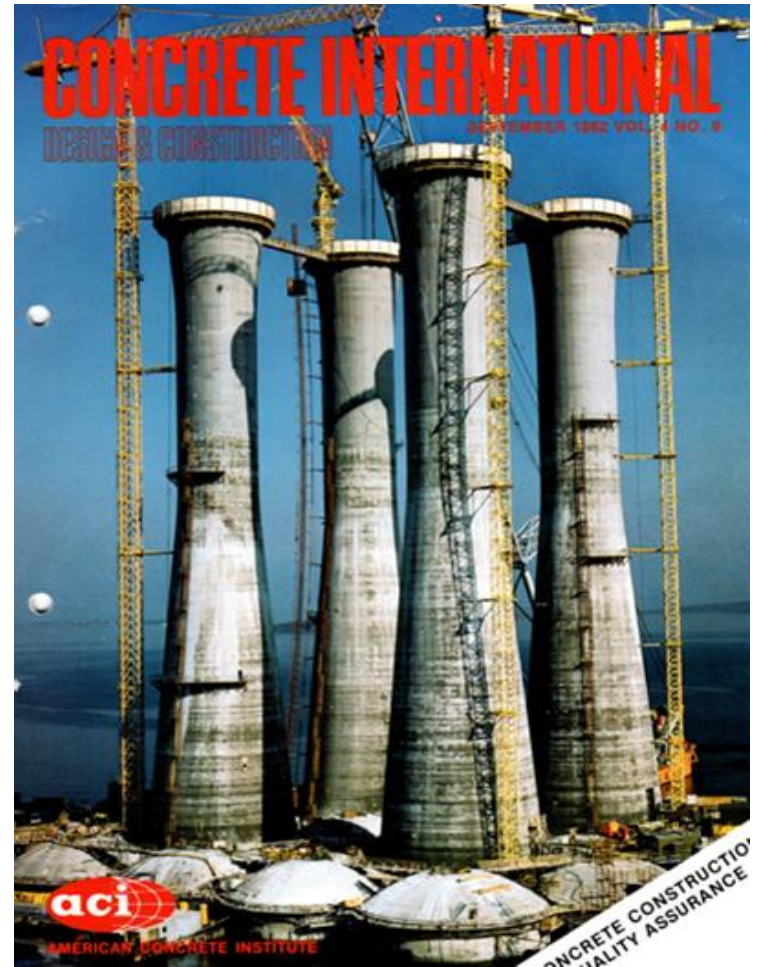
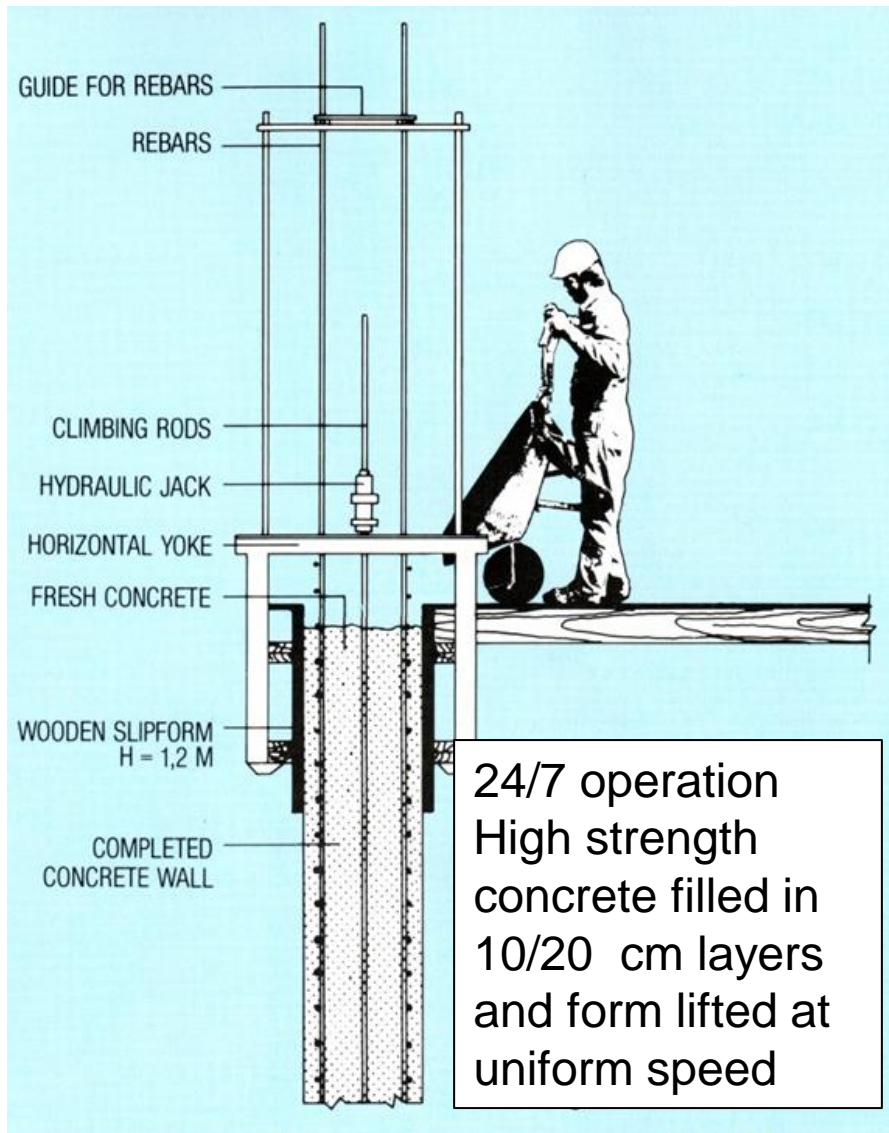


Size. Oseberg 1985. Footprint 17 000 m²



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Speed. Slipform construction



Statfjord B shaft slipforming 1980
110 m in 44 days: 2.5 m/day

Complexity. Cell walls slipforming GF C 1987



Total height 56 m
114 000 m³ concrete
24 000 tons steel
7 tower cranes
3 batching plants
42 days (1.3 m/day)
2000 people
HS (?)

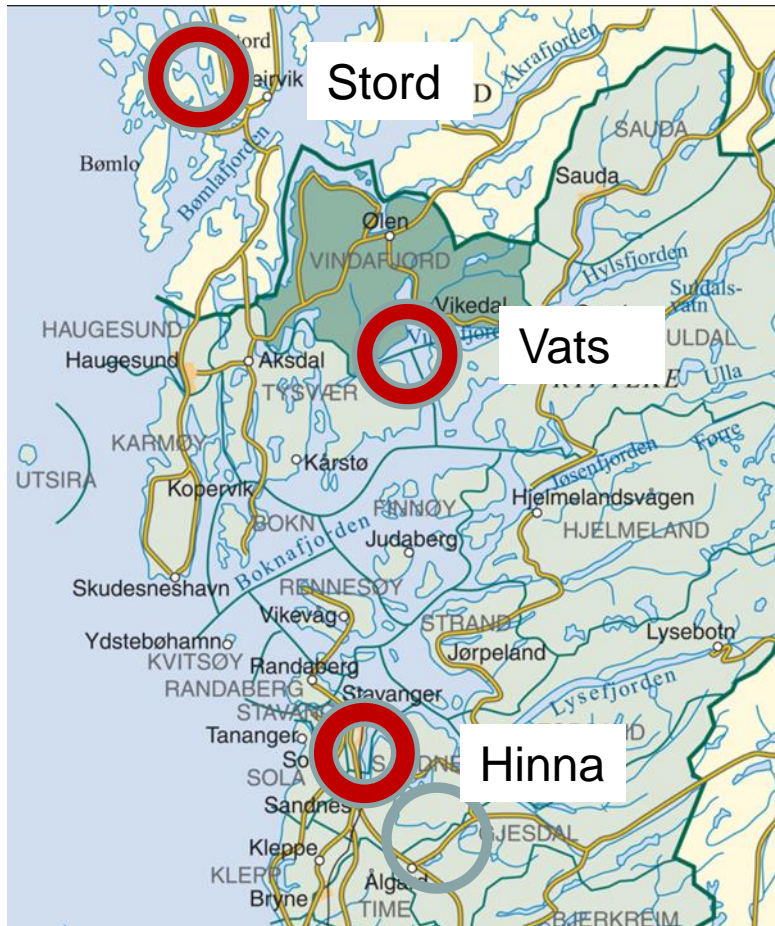
Deck mating. Draugen 1993 in Vats

279 m below and 6 m above water



High risk: Note
loss of Sleipner
in 1991





Marine operations

Deep fjords were required for completion, mating and tow to field. Vats and Stord were both utilized as deep water sites.

Troll A during tow to field in Yrkjefjorden (Vats) 1995.
Draft 227 m.



Depth 430 m

Multidiscipline projects



Mechanical outfitting



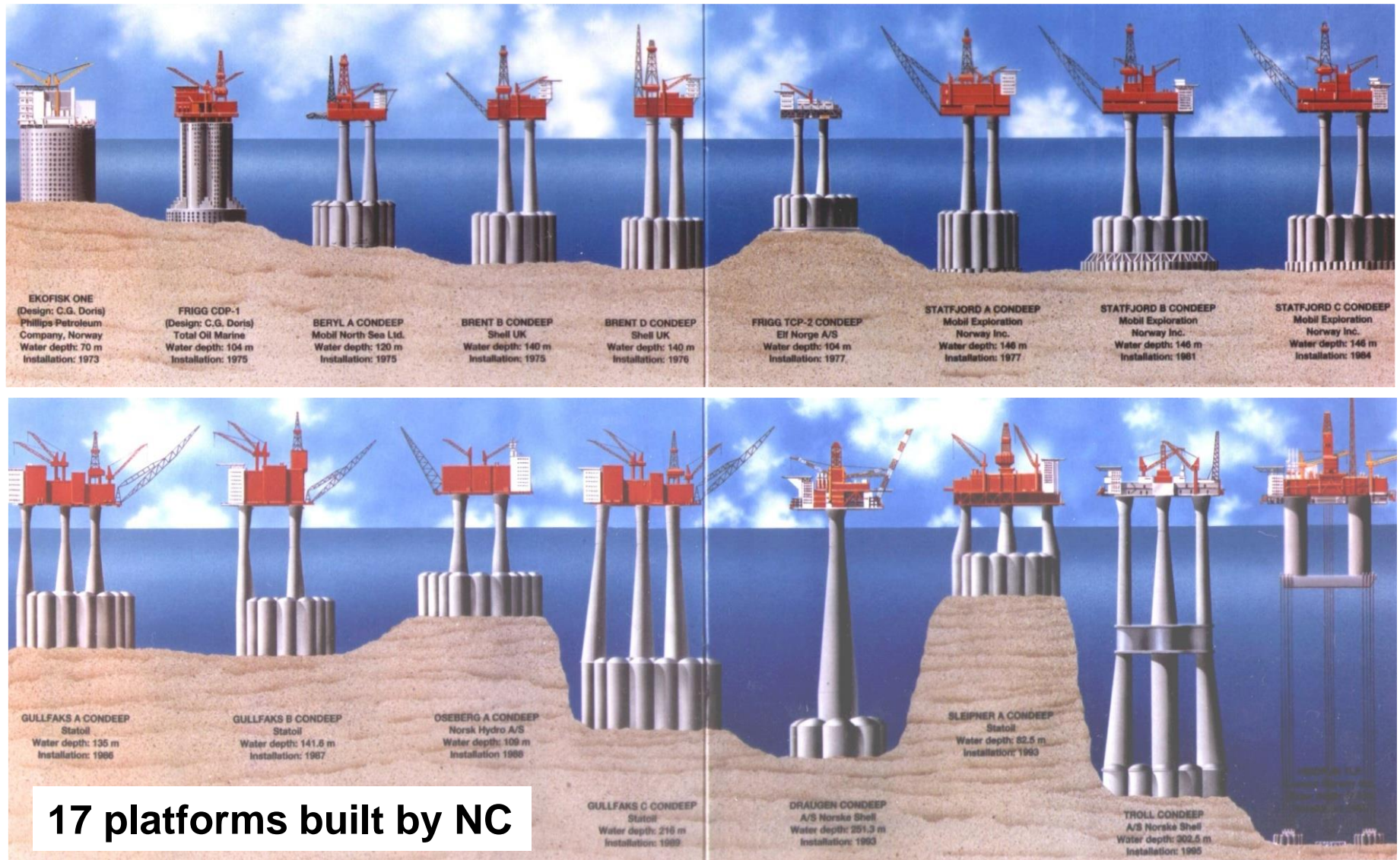
Rebars and piping systems prior to concreting

NC Hinna – a perfect construction site (1993)

Large area (300 000 m²), central location, deep fjord 230 m, mild climate, access to resources, materials, services.



1971 – 1995: A golden era for norwegian concrete



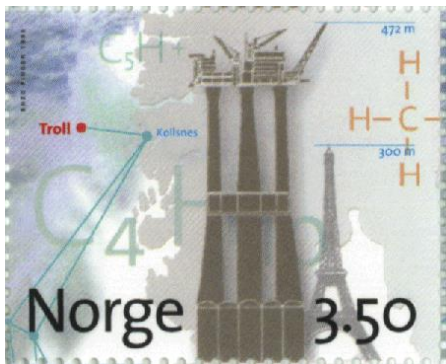
17 platforms built by NC

Troll A 1991 – 1995. The ultimate Condeep

Built at Hinna and Vats

- Water depth 303 m
- Height 369 m
- 245 000 m³ concrete
- 106 000 tons steel
- 6 mill. manhours

20 years experience and developments in design, construction, materials technology and project management.



The leaning tower – a spectacular R&D project

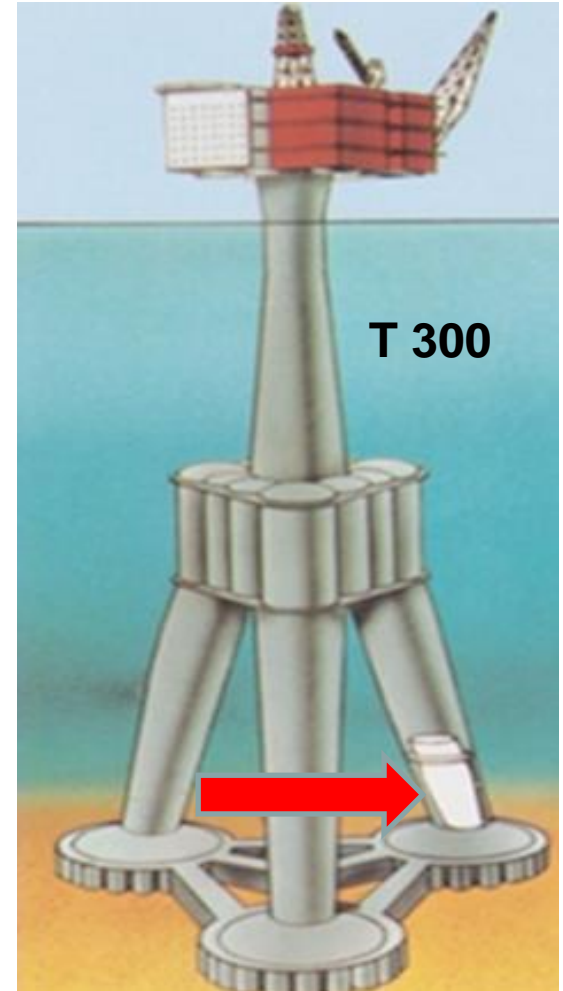
Performed in 1984 to demonstrate the feasibility of slipforming large inclined structures with varying diameter and wall thickness.



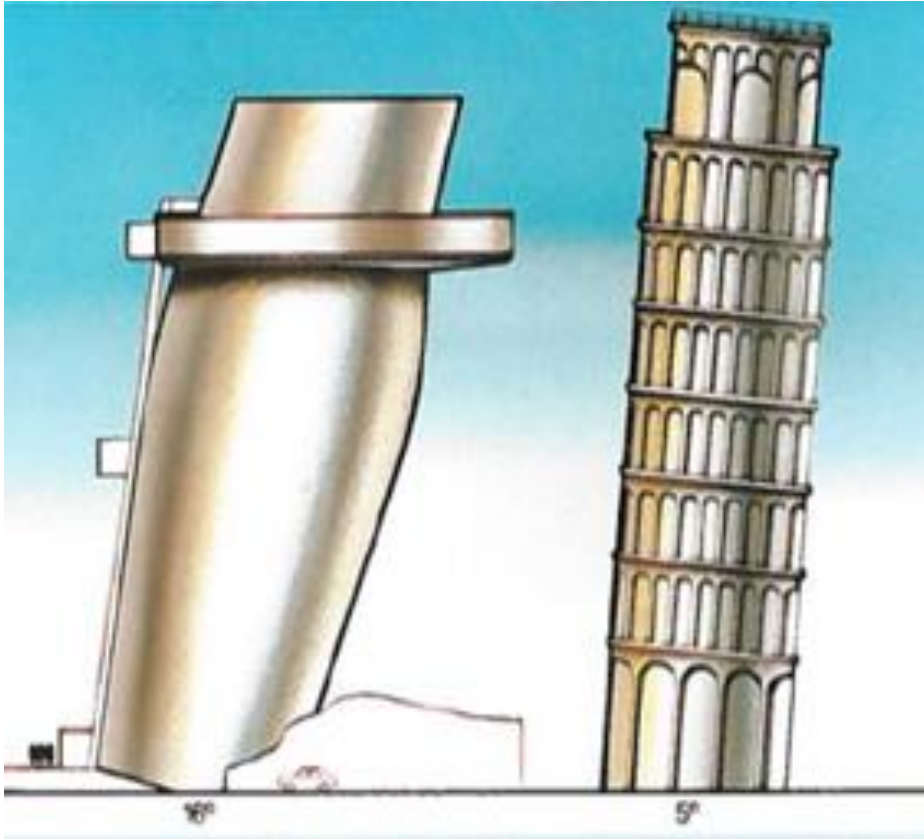
- Height: 50 m
- Inclination: 16°

T 300. The Troll concept in 1984

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Famous towers (!)



In 2001 the tower was declared a cultural heritage site by Stavanger City in recognition of the Condeep era.

Hinna from Condeep arena to Hinna Park.

The leaning tower from site test to land mark



HINNA PARK
MAKE BUSINESS A PLEASURE

The leaning tower.