

# IHC Gusto Engineering



IHC Holland

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IHC Gusto Engineering has been created by the merging, in their entirety, of the engineering, design and estimating departments which previously formed part of the offshore construction yard of IHC Holland. The result is in fact a regrouping of the sections which were concerned in the design and construction of the 225 items of offshore and other floating equipment supplied by IHC Holland during the past twenty years, which included jack-up platforms, dynamically positioned drillships, pipelaying barges, offshore cranes, fixed platforms and floating storage and production systems.

In the face of the increasing world surplus of shipbuilding capacity, the long distances separating the IHC yards from the new exploration and production areas, and the policy of many governments to stimulate construction at home, it was decided that the offshore engineering activities should be detached from IHC's construction yards and should continue on the basis that objects can be built anywhere in the world. This position is in line with a trend which had already commenced to manifest itself.

Engineering and construction having thus been separated geographically, these engineering activities will become part of other engineering capabilities of IHC Holland, which includes:

### **Mining and Transport Engineering**

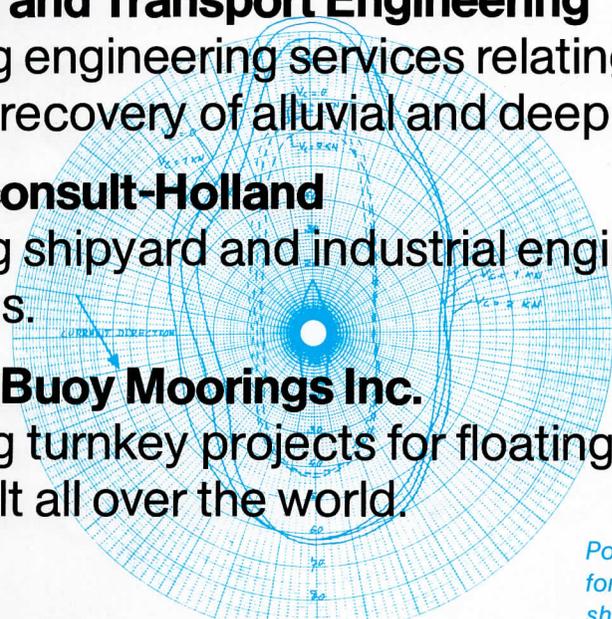
offering engineering services relating to vessels and systems for the recovery of alluvial and deep sea minerals.

### **Navalconsult-Holland**

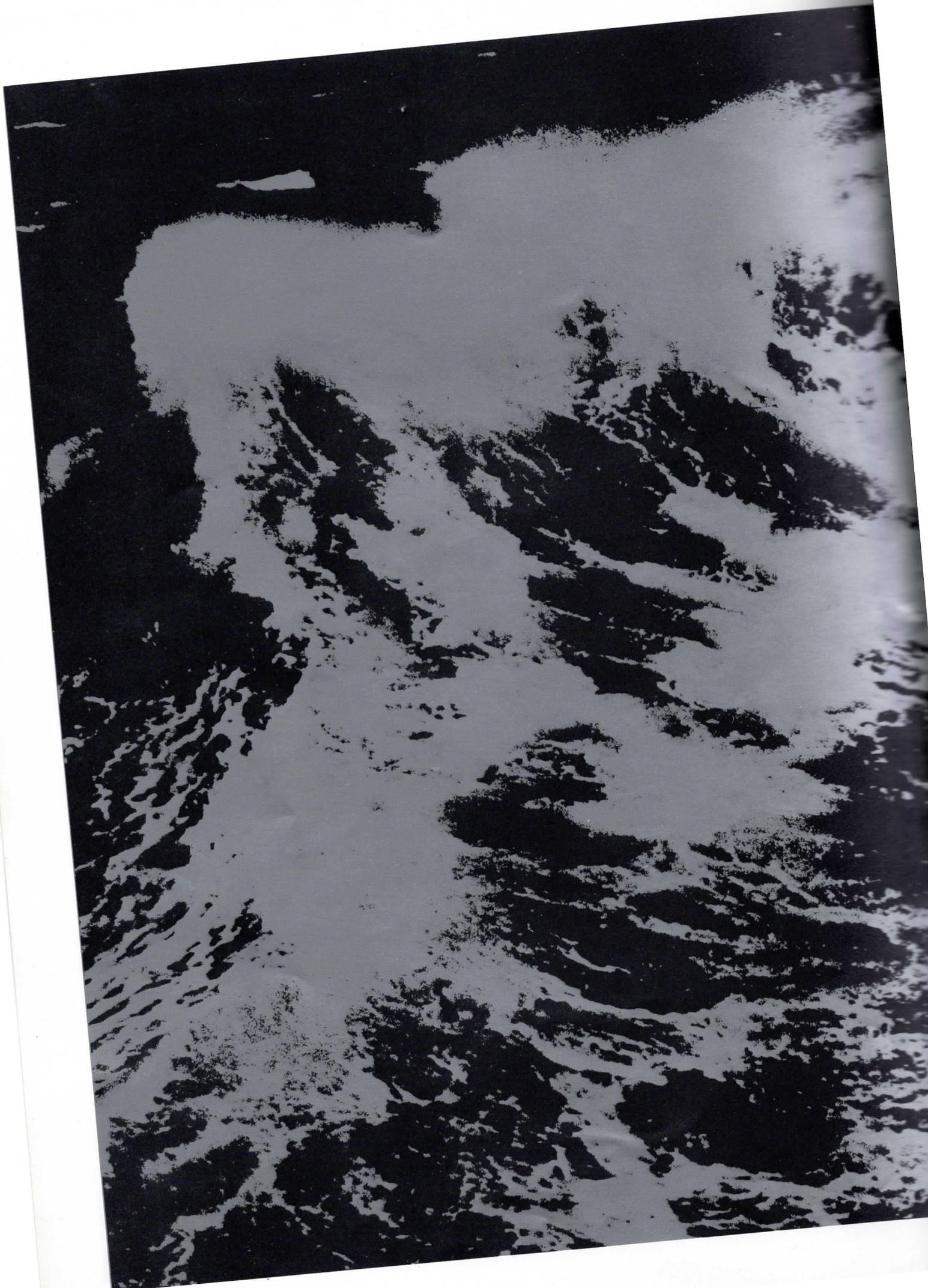
offering shipyard and industrial engineering and computer services.

### **Single Buoy Moorings Inc.**

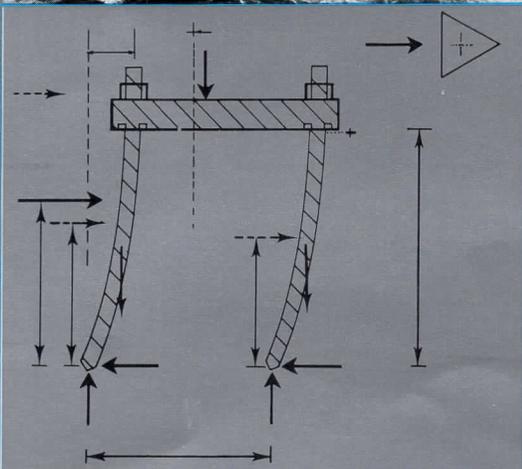
offering turnkey projects for floating offshore terminals, which are built all over the world.



*Position holding predictions  
for dynamically positioned  
ships*



## Scope of activities



- Turnkey projects
- Feasibility studies
- Technical and economic surveys
- Preliminary designs
- Capital cost estimates
- Computer programmes
- Detailed working drawings
- Model testing
- Choice of constructor
- Contract negotiations
- Design and supply of specific components
- Procurement
- Supervision of construction
- Trials and handing over
- Commissioning
- Operator training
- Maintenance support engineering

# Engineering capability

## Turnkey engineering

The majority of orders placed with IHC Holland involve complete projects. The Group possesses the know-how and experience required in preliminary studies, design and the preparation of specifications, and in all phases of the construction of a wide range of equipment used in offshore engineering. IHC were responsible for the design of the world's first third-generation pipelayer, which was realized in the *Viking Piper*. IHC developed designs for dynamically-positioned drillships and these are manifested in the *Pelican*, *Canmar Explorer III*, *Petrel*, *Pelerin* and a number of others built under licence. Research is continuing with the aim of increasing the efficiency and water-depth capability of vessels to this design. IHC also possess the know-

how required in the design and construction of:

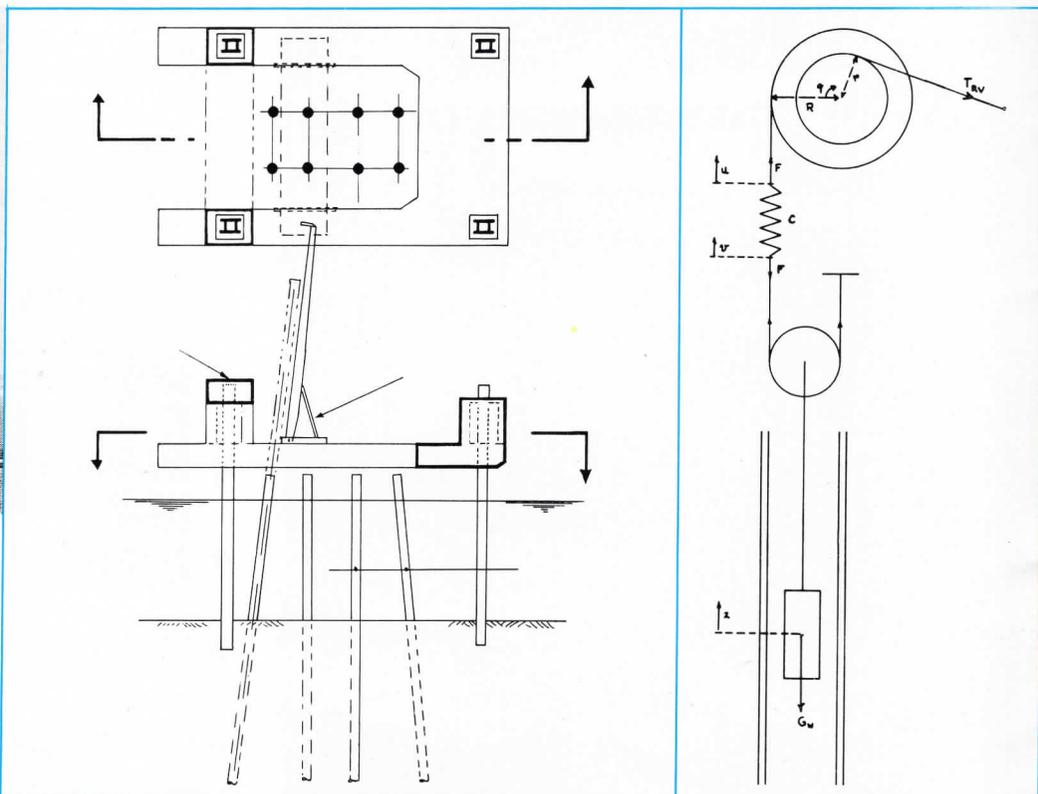
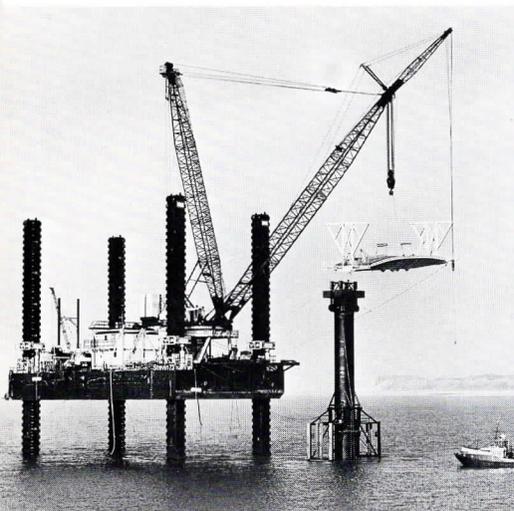
- offshore cranes
- drilling platforms
- offshore storage and transshipment systems
- self-elevating platforms for civil engineering purposes
- fixed platforms, well jackets and similar structures.

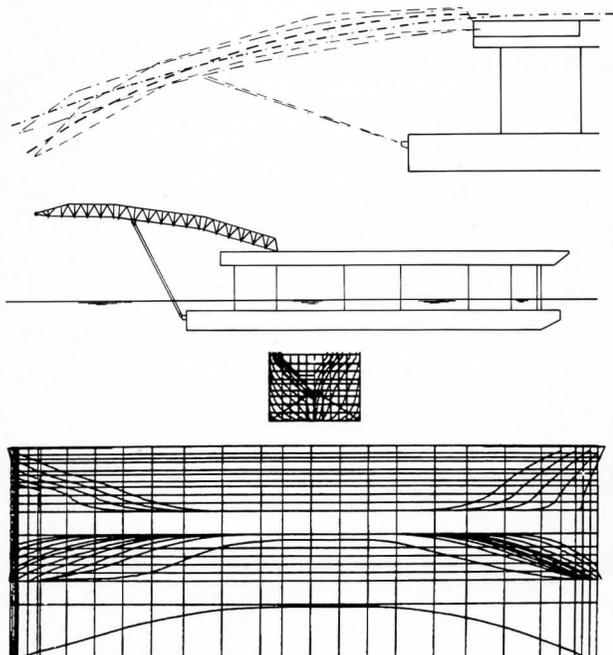
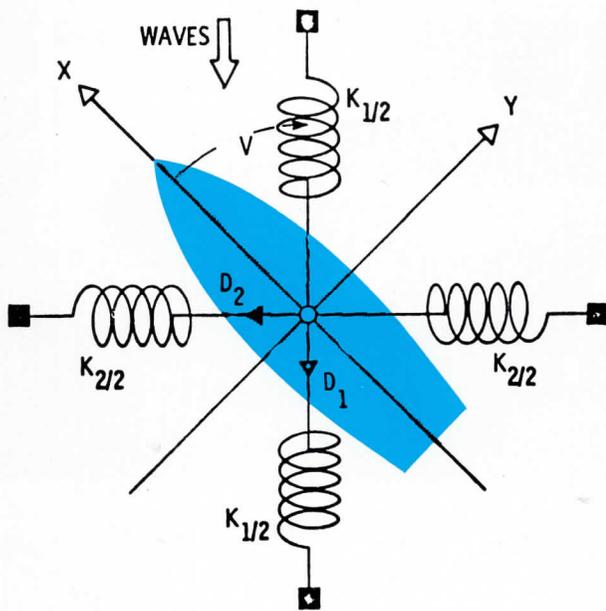
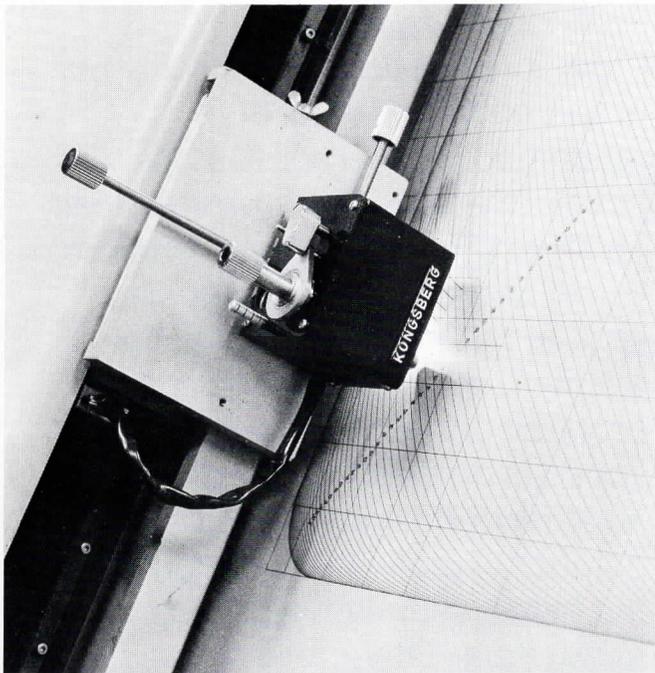
The engineering capability residing in the Group is not limited to these units, however.

The objects listed – and others – will be built at the most suitable location from both the technical and economic points of view.

Responsibility for their construction will be assumed.

Details of the vessels and other units engineered and/or built by IHC during the past twenty years are given in the Reference List at the end of this brochure.





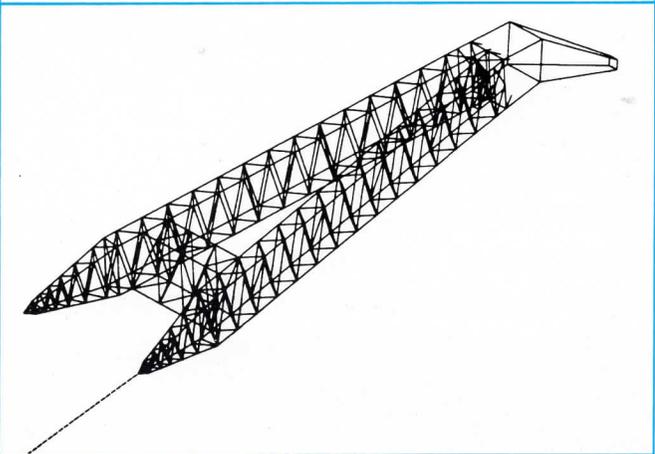
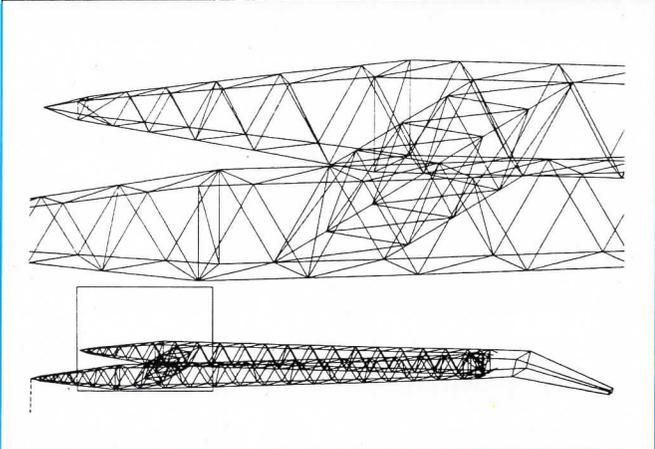
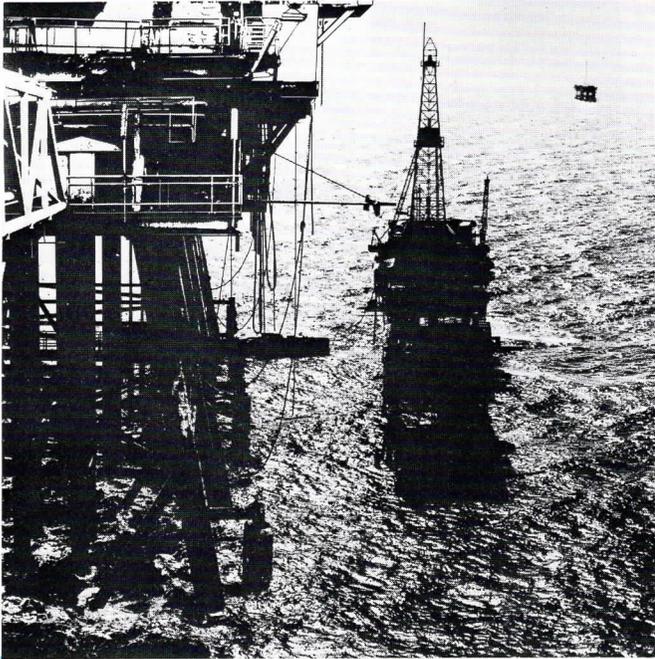
## Feasibility studies

The companies of the IHC Holland Group are well versed in the behaviour of equipment in or on the water. The designs for the objects built meet conditions ranging from shallow, calm, fresh water in tropical hinterlands to the wildest seas and extreme depths of the northern North Sea, and even in the polar regions. IHC companies are equipped to calculate the influence of swell, current and wind on floating, semi-submersible and bottom-supported structures in open water, to carry out simulated tests and to translate the results into conclusions and firm proposals. A wide range of computer programmes are available for these purposes, and the most up to date methods of calculation are employed. Input facilities exist for collaboration with specialized institutions such as the Netherlands Organization for Applied Scientific Research, the Netherlands Ship Model Basin and others.

Knowledge and facilities are available to demonstrate the technical feasibility of employing a given vessel, object or system in the open sea, and also the economic implications.

## Technical and economic surveys

IHC Holland are in a position to carry out inspection of equipment and systems, to prepare reports on technical quality and to make recommendations, supported by calculations, for the optimization of existing systems.



## Preliminary designs

Provisional designs can quickly be prepared on the basis of fundamental criteria. IHC Holland have in the past demonstrated their ability to produce designs, often of a new and advanced nature, for special-purpose equipment. For example, a new approach to the problem of laying pipelines at high speed in deep water under adverse weather conditions led, via a number of preliminary designs, to the third-generation pipelayer *Viking Piper*. Other advances included extending the application of swell compensation systems to new areas.

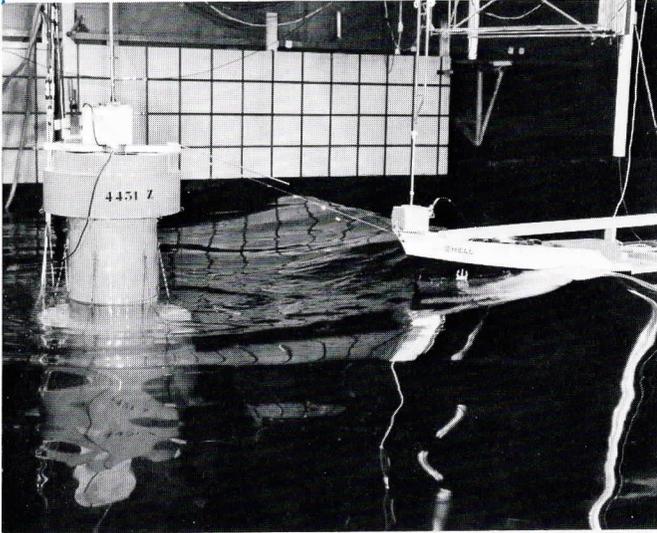
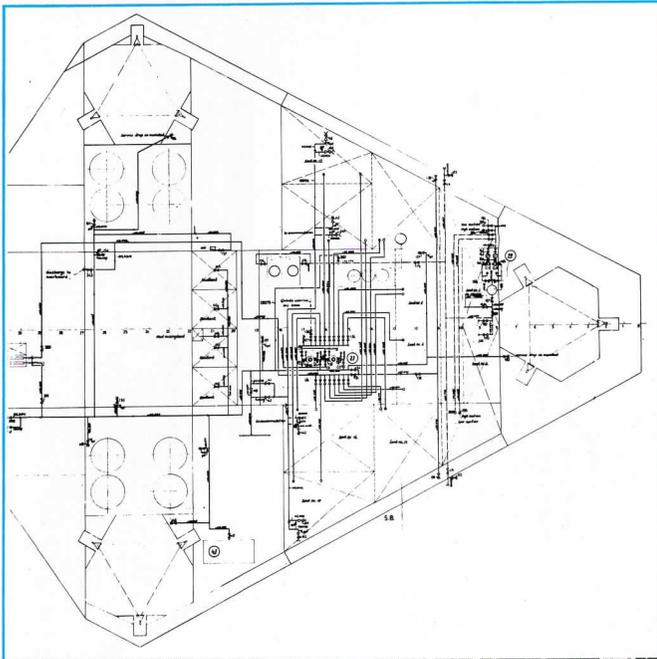
## Capital cost estimates

In tackling and solving problems the cost aspect is never lost from sight.

If desired, the overall cost of realizing a project can be estimated, a breakdown being given of material and processing costs, transport and insurance costs, and operating and maintenance costs.

## Computer programmes

IHC Holland have their own Computer Centre, whose services are available to all companies in the Group. A large number of programmes have been developed, serving a wide range of purposes in the areas of technology, production and administration.



### Detailed working drawings

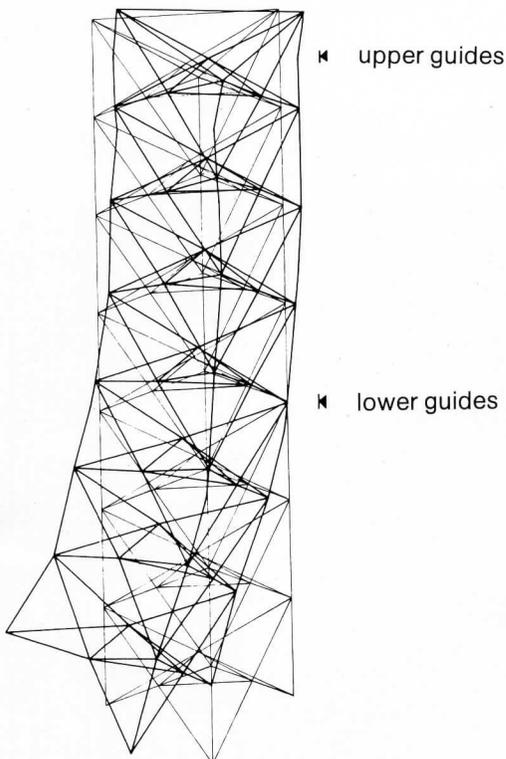
Working drawings and specifications conforming to various standards can be prepared. These are matched to the criteria laid down by the builders. IHC Holland are familiar with the production methods and systems used in the sector in which equipment of the type concerned is produced.

### Model testing

Model tests can be carried out in association with institutions of repute in the Netherlands in order to assess the behaviour of equipment under simulated design conditions.

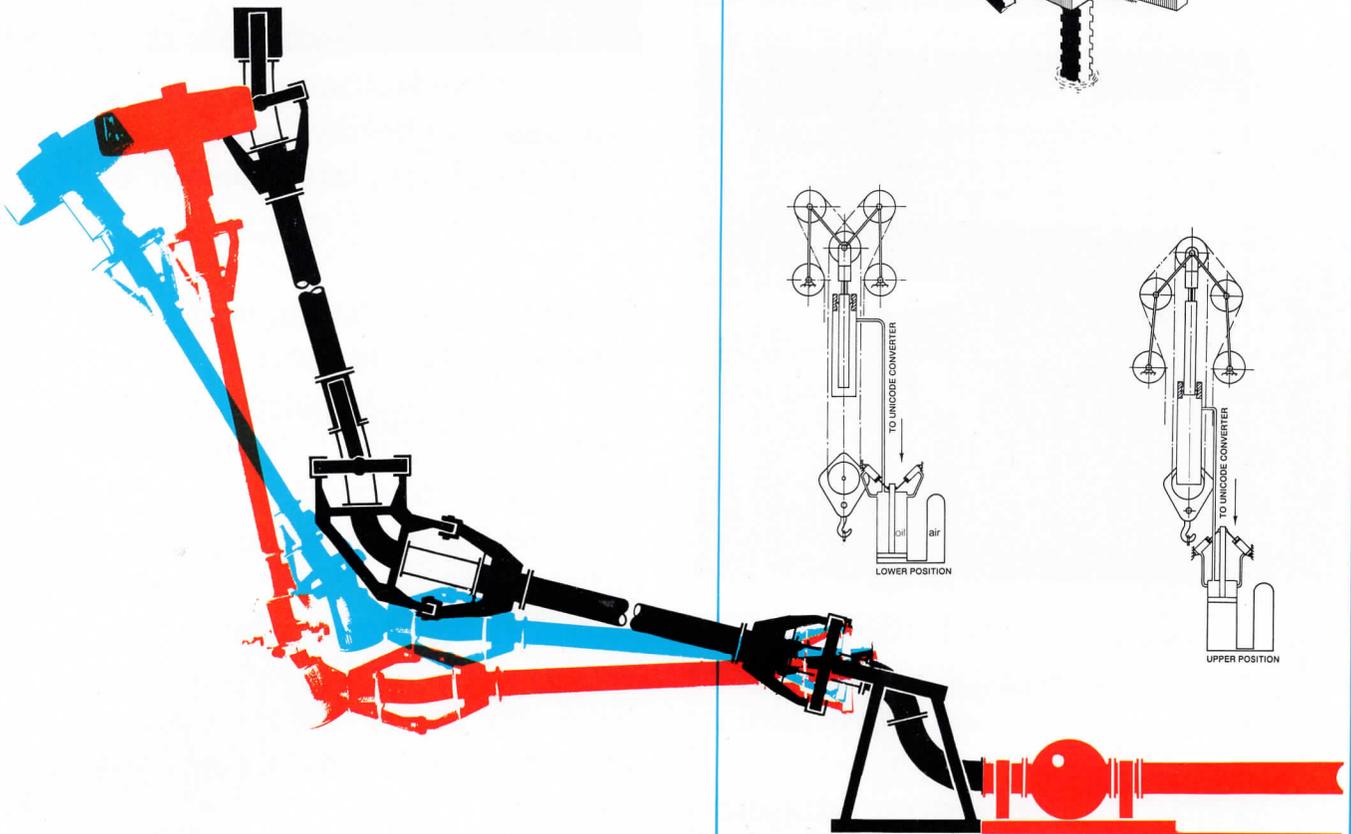
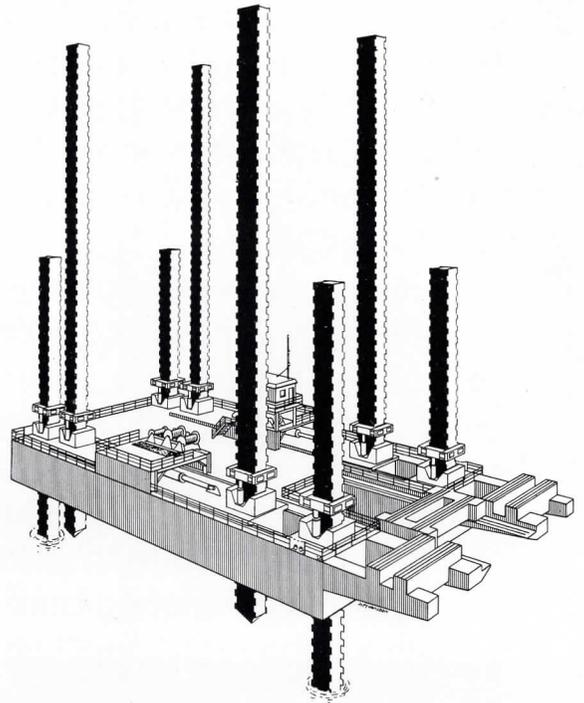
### Choice of constructor and Contract negotiations

As indicated in the introduction, IHC view the world as their building yard. That is to say, if an order entrusted to the company includes construction, the object will usually be built at the most suitable location, both technically and in economic terms. IHC have already employed this method in several countries.



## Design and supply of specific components

A design may embody specific components which can best be engineered and/or produced by one of the companies of the Group or a particular outside supplier. IHC Holland can undertake to obtain such items.



## Procurement

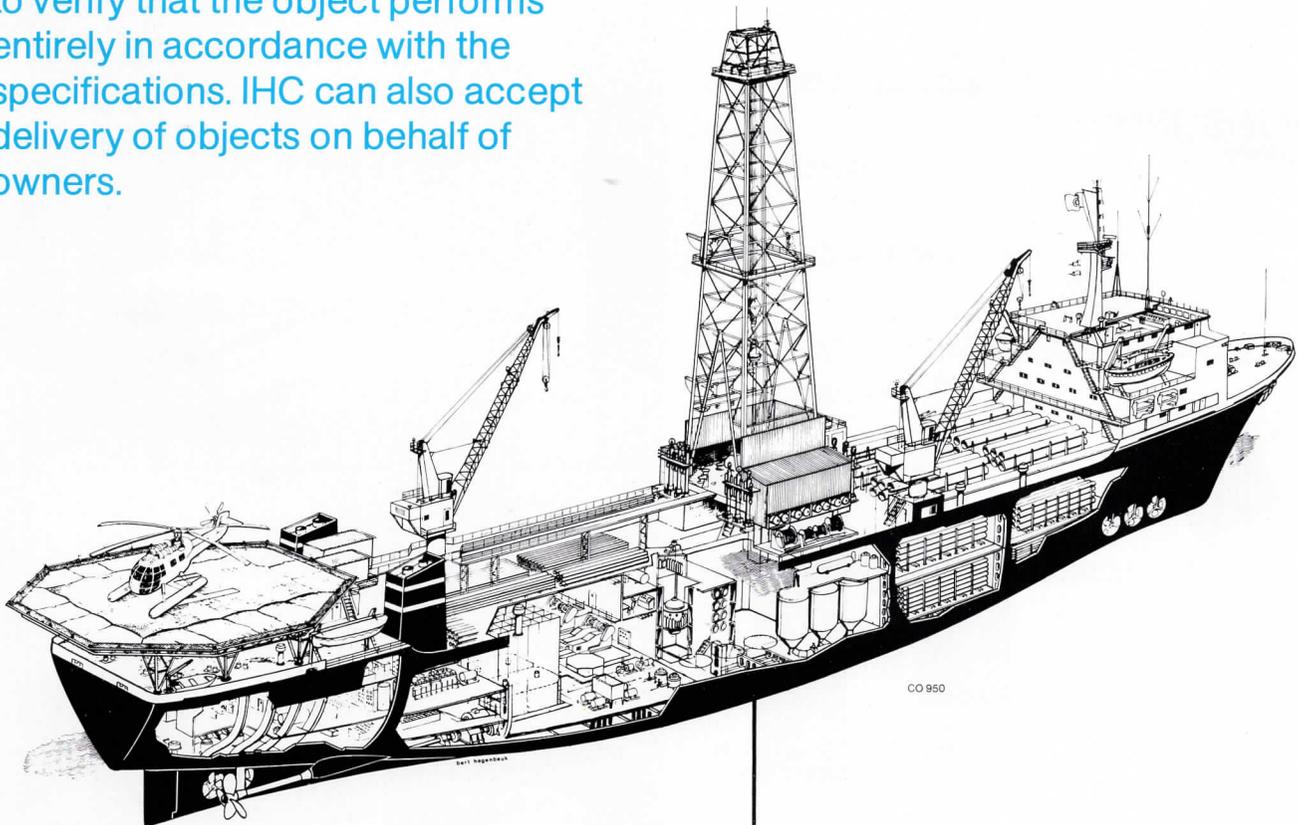
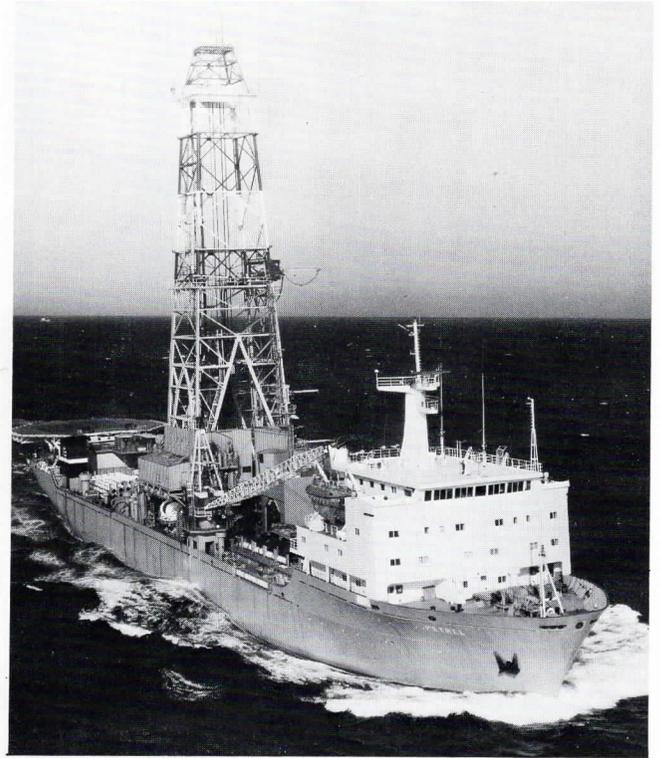
The construction of an object, irrespective of its nature, involves the purchase of numerous components. IHC Holland are in contact with the supply market and are equipped to undertake procurement.

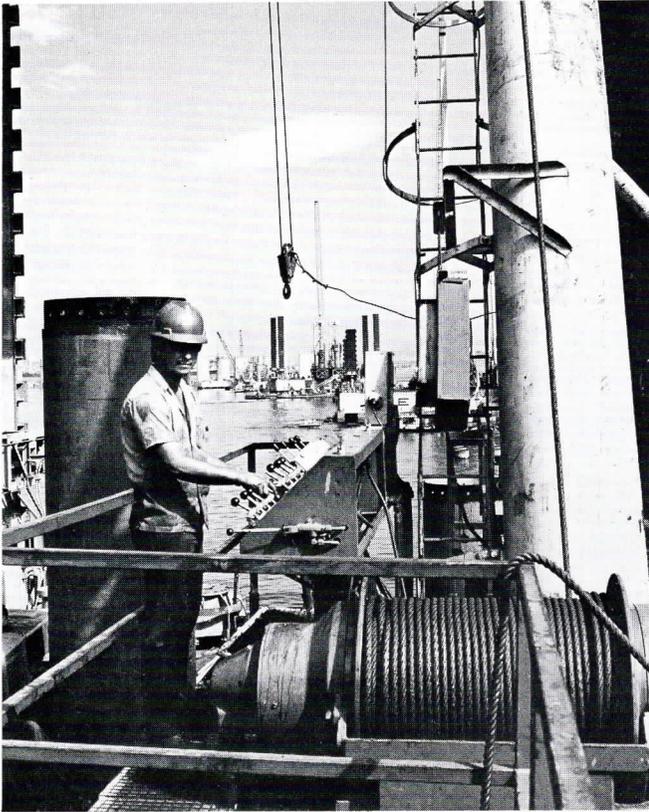
## Supervision of construction

Specialists are available to supervise the construction of objects on behalf of owners at any yard in the world. IHC Holland have considerable experience in this field, obtained in a wide variety of countries.

## Trials and handing over

IHC can draw up a trials programme in consultation with owners and builders, and provide engineers to verify that the object performs entirely in accordance with the specifications. IHC can also accept delivery of objects on behalf of owners.





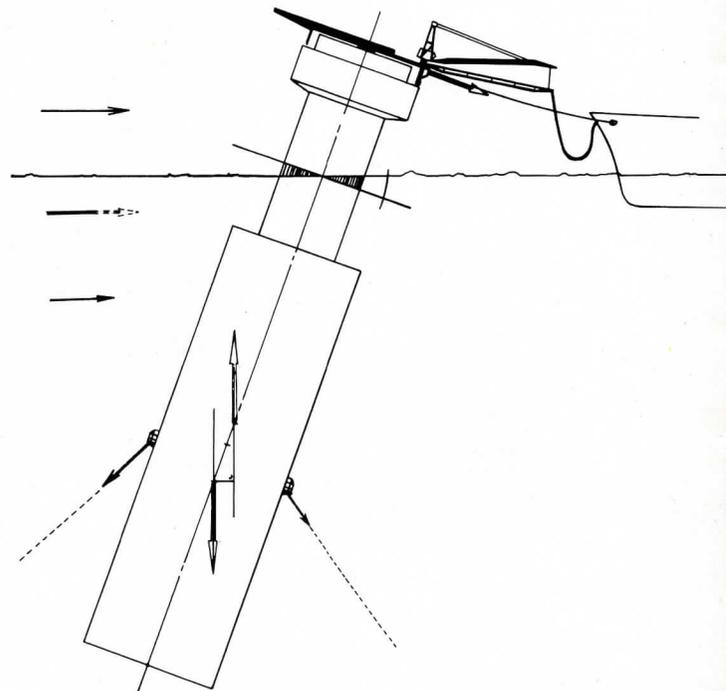
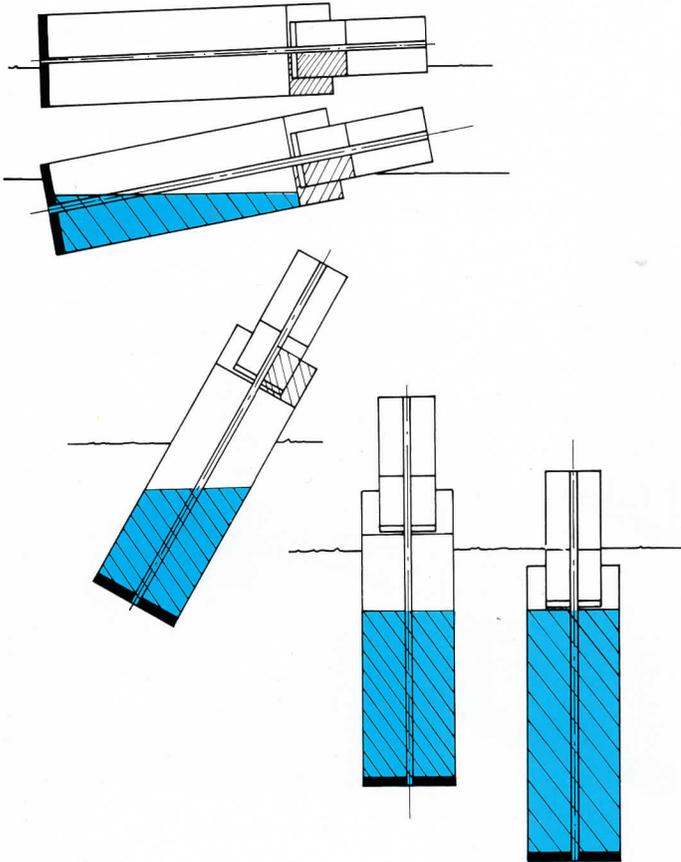
### **Commissioning and Operator training**

IHC can prepare an object or system for operation at its destination and carry out formal commissioning.

If desired, operators can be trained in the use of the equipment. IHC engineers are also available to carry out incidental, specialized operations at a later stage.

### **Maintenance support engineering**

IHC Holland can draw up programmes for the routine maintenance of objects in whose construction they have been concerned. Advice can also be given regarding the maintenance of existing equipment.



## Reference list

Between 1959 and 1978, IHC Holland designed the following offshore units:

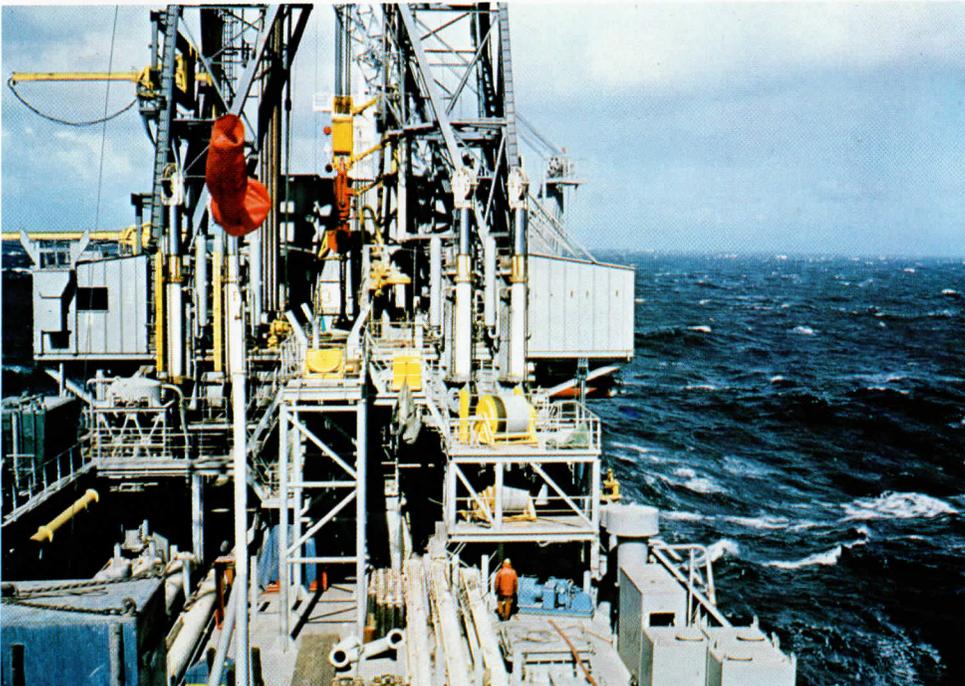
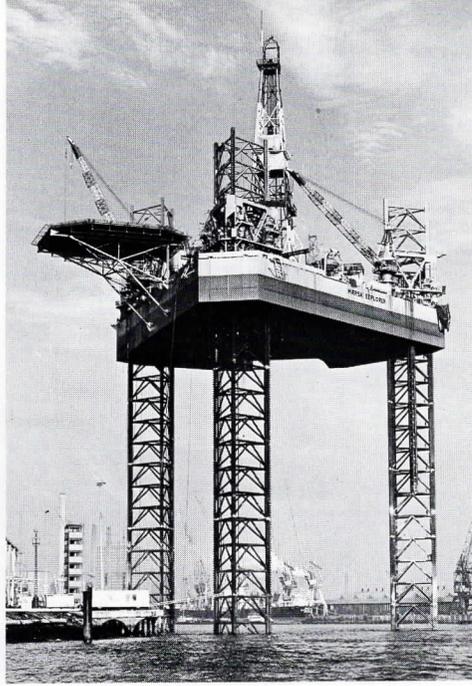
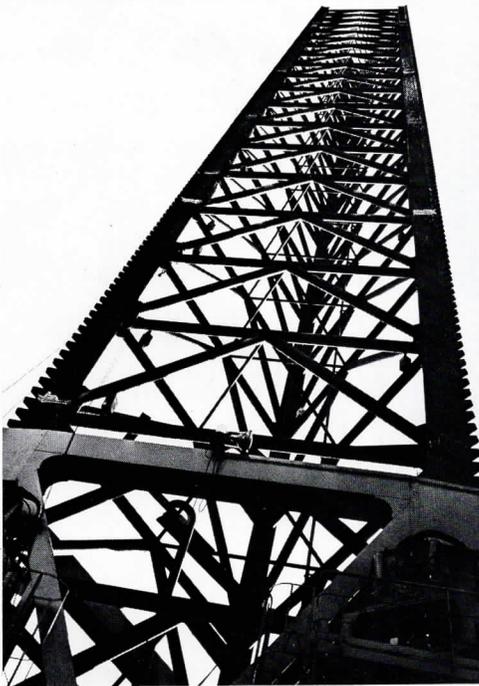
13 heavy-lift offshore cranes (including the *Narwhal*, *Thor*, *Orca* and *Choctaw*).  
8 were also built by IHC;  
5 were engineered by IHC and built in Japan.

29 self-elevating / drilling platforms (including the *Maersk Explorer*, *Petrobras III*, *Chazar* and *Seashell*).  
20 were also built by IHC;  
9 were engineered by IHC and built elsewhere.

7 dynamically-positioned drillships (including the *Pelerin*, *Petrel*, *Canmar Explorer III* and *Pelican*).  
5 were also built by IHC;  
2 were engineered by IHC and built in the U.K.

2 pipelaying barges:  
*Suleyman Vezirov*: designed by IHC, built by IHC and another yard and reassembled in the U.S.S.R.  
*Viking Piper*: design and assembly by IHC; construction sub-contracted to various yards in western Europe.

The other items of offshore equipment supplied by the IHC Holland Group include more than 100 single-buoy mooring systems – some of which have floating storage facilities – and nearly 100 well jackets, accommodation modules and production and field terminal platforms.





**Long history**

A number of the companies in the Group can look back on a very long history. The oldest dates from 1687. Not surprisingly, the amount of equipment designed and built over the years is impressive. The list up to the end of 1977 comprises:

**Dredging and ancillary plant**

- 371 bucket dredgers
- 255 hopper dredgers
- 481 cutter dredgers
- 44 barge-unloading dredgers
- 172 tugs
- 650 barges
- 76 dredgers of other types

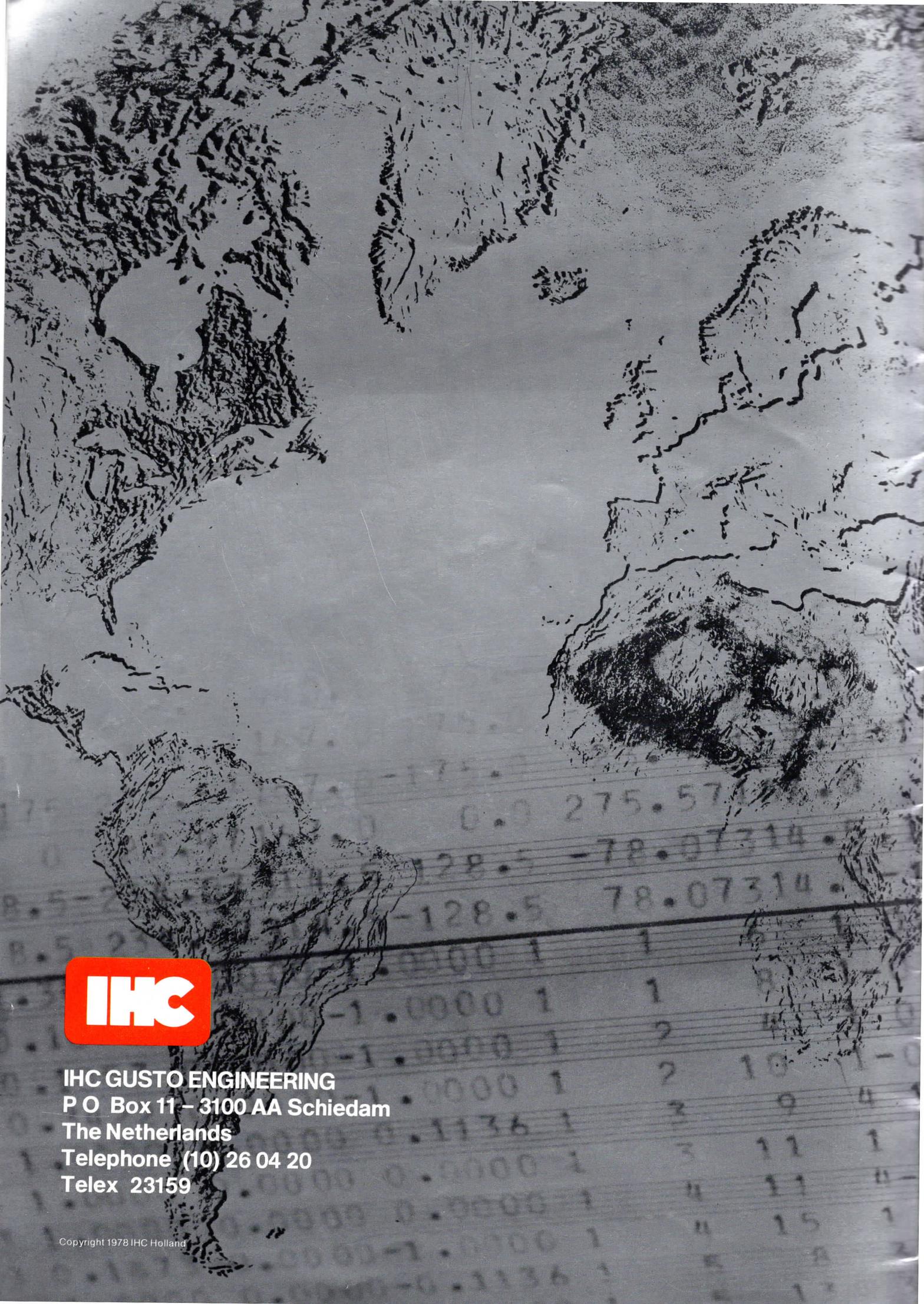
**Mineral mining equipment**

- 151 gold and tin ore dredgers

**General**

- 639 seagoing passenger and cargo ships and other vessels
- 121 floating cranes
- 23 grain and copra elevators





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