



*Reliable Solutions through **Innovative** Engineering*

**HELICOPTER REFUELLING
SYSTEMS FOR
OFFSHORE FACILITIES**

Certified by the American
Bureau of Shipping.



Introduction

Sypack is an organisation specialised in designing and supplying systems and packages for the offshore oil and gas industry. One of the main activities is in the field of helicopter refuelling systems for offshore applications.

Sypack aims to provide equipment and services that meet or exceed customers expectations. This aim is not only supported by product quality, expertise and motivation of employees, but also by a constant effort to maintain strongly developed quality awareness.

It is **Sypack's** ultimate goal to provide cost-effective solutions across a broad range of engineered systems used in the oil and gas industry.

It is our firm belief that quality and performance of our equipment itself is not the liberating key to meet this goal successfully.

What you need is an organisation with dedicated people, effective communication lines, application know-how and flexible order handling, due to providing effective solutions on demanding projects.

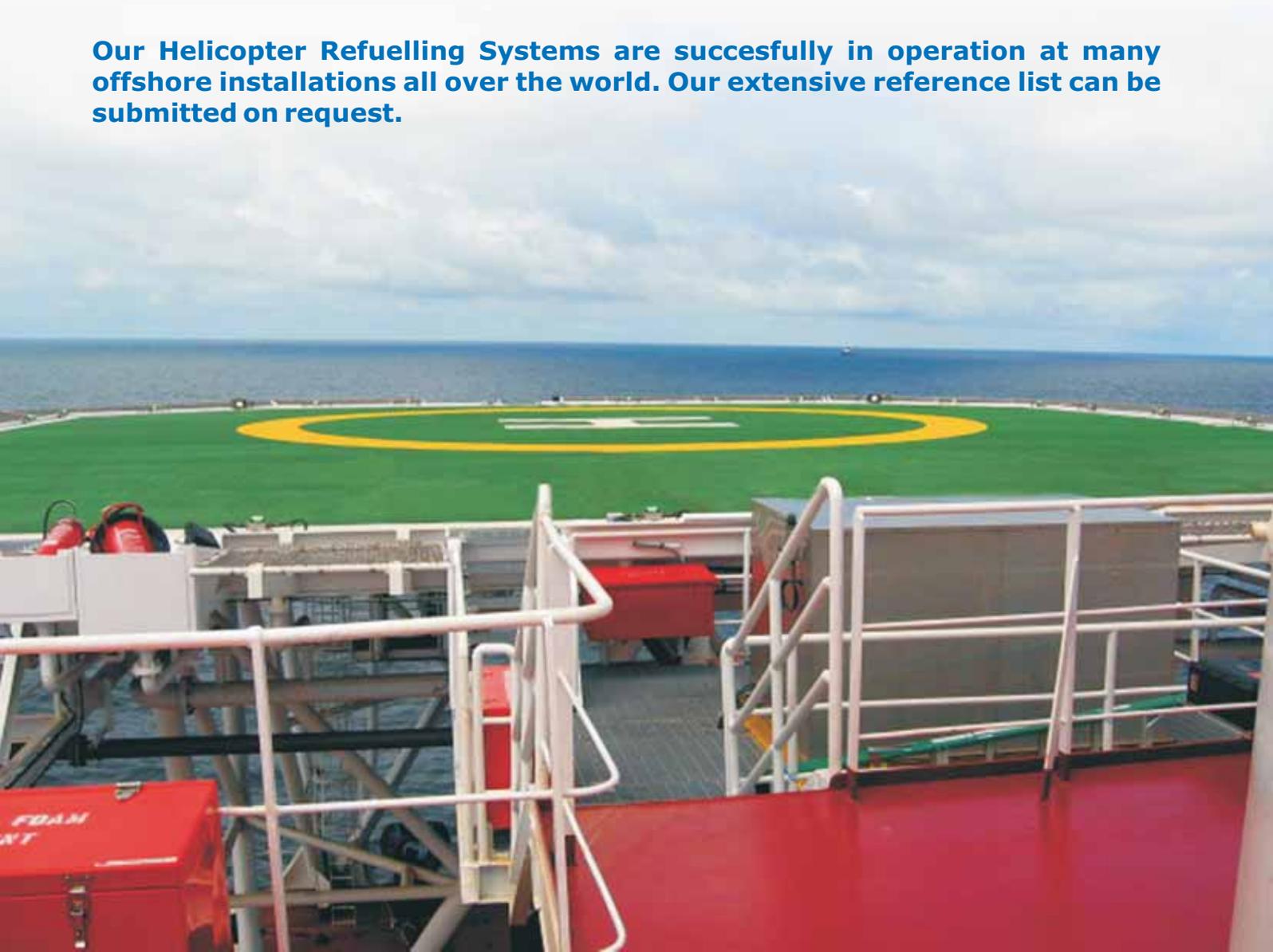
We support you with experienced and motivated people, who are strongly dedicated to your operation.



Helicopter Refuelling Systems

The solution for safe & reliable offshore refuelling

Our Helicopter Refuelling Systems are successfully in operation at many offshore installations all over the world. Our extensive reference list can be submitted on request.



Helicopter Refuelling Systems

Sypack designs and supplies helicopter refuelling systems to customer requirements and conform to local and / or international regulations. Our systems are installed on offshore production platforms, drilling rigs, drillships, support vessels, FSO's and FPSO's.

Codes and Regulations

Sypack helicopter refuelling systems can be designed and supplied in accordance with:

- International codes such as CAP 437
- Mining Reg. Dutch Continental Shelf
- NORSOK specifications
- Norwegian OLF requirements
- UK Regulations as defined by UK00A
- Military specifications
- Any other rules or regulations

System Description

Each helicopter refuelling system normally consists of below listed equipment:

- Tank laydown skid or Jettison platform
- Deluge system
- Storage tank (stationary or transportable)
- Fuel pump(s)
- Filter / water separator(s)
- Filter monitor(s)
- Air eliminators
- Local control panel
- Hose reel with filling nozzle
- Earth prover system
- Flow meter

The system can be supplied as an "open" skid mounted unit, or installed in a cabinet with roller door.



Tank Laydown Skid

Our tank laydown skid is designed to store the transportable tanks and protect them against fire with a deluge system with spray nozzles. This skid is manufactured of mild steel and of all continuous welded construction in order to form a rugged unit.



The skid will be equipped with a drip tray over complete area, 4 lifting lugs, buffer frame and deluge line.

The top section of the buffer frame is chamfered, which assists the crane driver during handling of the tanks. Moreover, this chamfered top section protects the deluge line



Storage Tanks

The storage tanks can be either mounted on the skid or installed separately. Often used volume of a jetfuel storage tank is approximately 3.000 litres, however every other required volume is possible. Tanks are manufactured from stainless steel.



Storage tanks will be foreseen with connections for: inlet, outlet, vent, relief, drain, dipstick, manhole, inspection hole and sampling.

Tank design

- DNV 2.7-1
- IMDG-T4
- EN 12079
- ASME VIII Div.1

Pump Types

The helicopter refuelling system can be supplied with a single pump, or two pumps in parallel, one in operation and one in stand-by mode.

Pump type used is Sliding Vane, according API-676. Capacity of the pumps to customer requirements or to local regulations.



Filter Water Separators

Filter / water separators guarantee the required purity of aviation fuels. Separation of solid particles by filter / water separator avoids blockage in the fuel distribution system, and prevents premature wear in control and regulation equipment.

Filter / water separators remedy two water related problems by drying aviation fuels. They reduce corrosion and growth of microbes, bacteria, algae and slimes, which occur in the presence of water.

The filter / water separators **Sypack** uses comply with API 1581 5th edition and Military standard MIL-F-8901 E.



Filter Monitors

Filter monitors retain finest solid particles and absorb free and emulsified water, even if surfactants and fuel additives are present in the fuel.

They also interrupt the flow in case of a water slug. It is thus ensured that the helicopters are only refuelled with clean and dry fuel.

The filter / water separators and filter monitors are constructed in accordance with:

- ASME VIII div. 1, with or without "U" stamp
- BS-5500
- AD Merkblatt
- Stoomwezen Rules for Pressure Vessels
- Any other pressure vessel design code

Material of construction is stainless steel.

Hose Reels

The complete system includes for a hose reel, which can be operated in one of the following manners:

- Manual
- Electric driven
- Pneumatic driven



Filling Nozzles

The filling nozzle will be part of the hose reel assembly. There are two types of filling nozzles:

- The "overwing" nozzle, used for gravity filling.
- The "underwing" nozzle, used for pressure filling.



Earth Prover System

To prevent that the explosive air-gas mixture will ignite during the refuelling process, we include for an earth prover system.



This system has two control functions:

The connection line between the helicopter and the earth is controlled for resistance, and therefore a neutralisation of existing, or during the refuelling process arising charges to the earth is guaranteed.



Moreover, the instrument controls the regular use of the earthing line because the helicopter is classified during the pinching of the earthing clip.

Sample Recovery System

As a result of more stringent environmental regulations we offer the possibility to include for a sample recovery system. The kerosene used for sampling will be stored in a small storage tank.

When a certain level is reached, the kerosene will be pumped back through the filter separator into the storage tank. This system prevents spillage of kerosene caused by taking samples from the helicopter refuel unit.

Service, Maintenance and Training

In order to extend the lifetime and to maintain proper and safe operation of the equipment, we can offer our clients Service Management for maintenance and inspection.

We will provide the client with a maintenance plan which is compiled based on experience, good sense and, of course, clients wishes. We have the knowledge to enhance the reliability and to maximize the availability. After a system has been installed and commissioned, we can provide a training to it's future operators. During this training the following topics will be discussed:

- Explanation of rules and regulations
- Basic equipment functionality
- Operating the helicopter refuel system
- Daily operations
- Safety features and controls
- First line maintenance
- Time for questions



Operational Parts

During operation of a Helicopter Refuelling System, certain operational parts are required. **Sypack** keeps stock of a comprehensive range of parts, such as:

- Water detectors
- Density meters
- Sample jars
- Filter elements
- Refuelling nozzles
- Wheel chocks
- Wind socks





Eikenlaan 32, 2382 ED | Zoeterwoude, The Netherlands
Tel. 0031 (0)71 5421021 | Fax 0031 (0)71 5421025
e-mail: info@sypack.nl | web: www.sypack.nl

