HLO HELICOPTER LANDING OFFICER

RelyOn Nutec
360° Safety

Introduction

This handbook is issued for training purposes only, with the intention of documenting the regulations and requirements of the govern-mental and other authorities involved in the offshore mining and shipping industries in the North Sea area, as they apply to the helideck. It is further intended to document normally accepted practice with regard to helideck procedures, and does not reflect the procedures of any one company specifically.

For the purposes of this document the standards normally used or quoted are those relevant to the Dutch sector of the North Sea. Where other standards have been used or quoted every effort has been made to identify them as such.

The following advice is given to all personnel attending this training course:

It is essential that the rules and regulations of your own company be complied with at all times. Any changes that may be of benefit in improving the general safety of helicopter operations, and personnel involved in such operations, that may have been gained from this course, must first be discussed with representative(s) of the company concerned.

Supplemental information or revisions will not be automatically issued.

In this document, the masculine form has been used throughout. The feminine form is inter-changeable for the purposes of this document.

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Manual Contents

Chapter 1

Responsibilities as Defined by the Law

Responsibilities Etc as defined by The Law

The following chapter is intended to provide the HLO with a brief overview of the regulations, by country, which are applicable for the countries bordering on the North Sea. Emphasis is placed on the responsibilities of the HLO. The design and equipping of the helideck is covered in more detail in chapter 4.

International Regulations

There are a number of organizations, internationally, that have established regulations, rules or guidelines that are used for the basis by individual countries for the establishment of their own regulations.

Joint Aviation Authority

The Joint Aviation Authority is an organization in which more than 20 countries in Europe cooperate to establish requirements for the safe operation of aircraft. The national aviation authorities of the countries bordering the North Sea offshore are all represented in the JAA. All member countries of the JAA have committed to comply with the minimum standard set by the Joint Aviation Requirements (JAR's). Some member countries have established regulations that place additional requirements.

At present the JAA has not established a JAR document dealing specifically with helidecks. However, one is expected in the near future.

ICAO

The International Civil Aviation Organization (ICAO) is a world wide organization which has established standards of practice which are accepted as being normal for the aviation industry. The JAA and its member countries operate to the ICAO standards as a minimum. In many cases the ICAO has been used as a basis upon which to build the national aviation authorities, or the JAA's, regulation.

The Netherlands

Which Laws Apply?
Regulations covering the duties of a Helicopter Landing Officer employed in areas under the control of the Netherlands are to be found in the following publications

- Further Rules Mining Regulations Continental Shelf concerning Helidecks as issued by the Minister for Economic Affairs for The Netherlands "Mijnbouwregeling and ARBO besluit verkeer en vervoer"
- In the future ICAO annex 14!

Responsibilities Of The Helicopter Landing Officer.

Mijnbouwbesluit, defines the basic responsibilities of the HLO, including:

- on offshore installations, or ships involved in offshore operations, there must be a person appointed to act as the Helicopter Landing Officer (HLO).
- the HLO is responsible for the supervision of the safe and orderly use of the Helideck
- during helicopter operations, he must be constantly in contact, via communication apparatus, with the aircraft commander.
- during helicopter operations, he must be present on the helideck and must be clearly identifiable as such by the wearing of a reflective vest upon which the letters HLO are present on the front and back.
- the HLO must ensure:
  - that safe use can be made of the deck
  - that, during helicopter operations, measures are taken to ensure the safety and good order on the helideck
  - that the equipment required in connection with the operation of helicopters is ready for use
  - that the personnel assigned to the helideck are appropriate to their task
  - That passengers are supervised to and from the helicopter
- each and every time, before commencement of helicopter operations, the HLO must satisfy himself that the fire fighting and rescue equipment can immediately be put into service

Training Requirements

The Helicopter Landing Officer must have completed a training course, approved by the national aviation authority, which covers the following subjects:

a Helicopter fire fighting and rescue.
b Guiding passengers on the helideck
c Cargo handling and documentation.
d Radio communication procedures during arrival and departure of helicopters
e Regulations with regard to design and equipment of helidecks on mining installations
f Normal and emergency procedures during helicopter operations.
g Helicopter refuelling and the quality control of aviation fuel if the individual is working on a helideck which has a fuel system onboard.

Anyone else involved with the helideck during helideck operations is required to complete a course covering the same topics with the exception of items c and d above.
Prerequisite Training Requirements
Before participating in a helideck crew course (HLO,HDA), the candidate should have completed the prerequisite training

Duties Of The Helicopter Landing Officer.

The regulations define the responsibilities of the Helicopter Landing Officer, but do not necessarily name all of his duties.

The allocation of the duties and tasks to the Helicopter Landing Officer is the responsibility of the Offshore Installation Manager. This will depend on the operating company organization, together with the requirements of the helicopter operator.

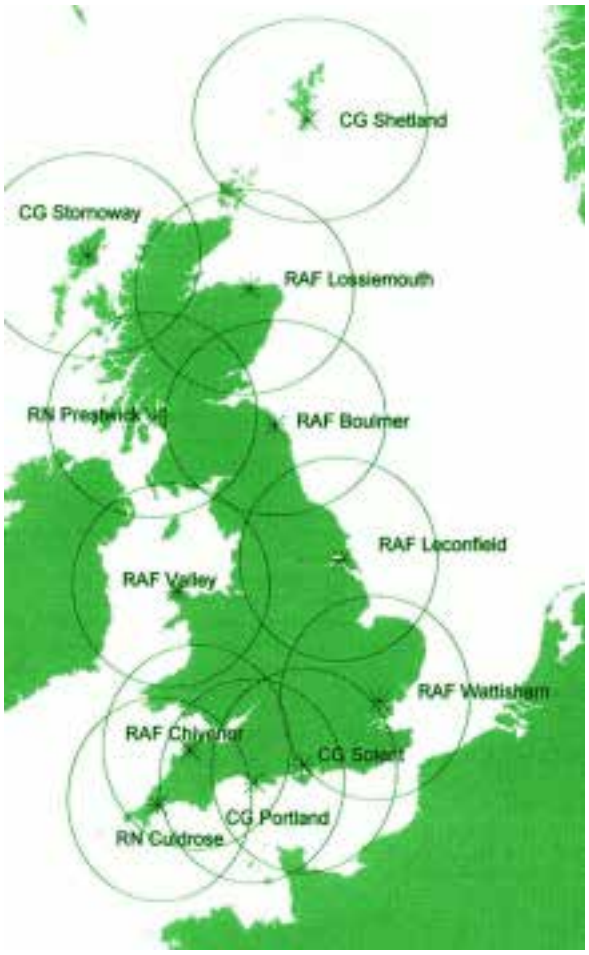
Related Duties.

There are a number of duties that may be carried out by a person or persons working in support of the helicopter activities. All personnel when carrying out such duties should be under the direct control of the Helicopter Landing Officer.

Helicopter Landing Officer, A "Job Description".

The Helicopter Landing Officer must have read and understood the emergency procedures manuals of the company operating the offshore installation or vessel. In some cases the contractor will also provide special instructions for helicopter operations.
The basic responsibilities of the Helicopter Landing Officer are as follows:

- Control the safe movement of all personnel on, and in the direct vicinity of the helicopter landing platform. This also includes disembarking and embarking passengers in cooperation with the helicopter crew.
- Control of the loading and unloading of cargo on instructions of the helicopter crew.
- Control of the refuelling of the helicopter in accordance with the requirements of the captain of the helicopter.
- Daily control of the aviation fuel quality and the refuelling installation.
- Provision of manifests for passengers and cargo, and the required documentation for the safe transport of special loads.
- Maintenance of the required administration.



The United Kingdom

Which Laws Apply?

Regulations covering the duties of a Helicopter Landing Officer employed in areas under the control of the United Kingdom are to be found in the following publications

Air Navigation Order
Aircraft Fuelling: Fire Prevention and Safety Measures - CAP 74.
Offshore Helicopter Landing Areas: Guidance on Standards Dec.1993 - CAP 437.
Aviation Fuel at Aerodromes - CAP 434.
The Offshore Installations and Pipeline Works(Management and Administration) Regulations (MAR) Statutory Instrument 1995 No.738
The Offshore Installations (Prevention of Fire and Explosion, and Emergency Response) Regulations (PFEER) Statutory Instrument 1995 No.743.
Health and Safety Executive, Offshore Safety Division, Operations Notices
Health and Safety Executive, Offshore Safety Division, Safety Notices

Non regulatory documents which provide guidelines for accepted and acceptable "good industry practice" include:
Guidelines for the Management of Offshore Helideck Operations U.K. Offshore Operators Association Ltd. UKOOA(Aircraft Committee)
Guidelines for Offshore Helicopter Refuelling Systems U.K. Offshore Operators Association Ltd. UKOOA(Aircraft Committee)
Emergency procedures manual. As issued by the owner or operator of each Offshore installation or vessel.

The Air Navigation Order.

The air navigation order requires that the person who has the management of an aviation fuel installation at an aerodrome (as a helideck on an offshore installation or vessel is in broad lines classified as an aerodrome this means the Helicopter Landing Officer) shall satisfy him or herself that:

- The fuel that is delivered is of a grade appropriate to the refuelling installation.
- The installation is capable of storing and dispensing the fuel in a state fit for use in aircraft (Helicopters).
- The refuelling equipment is correctly marked to indicate the type of aviation fuel it contains.
- The fuel that is delivered has been sampled and tested to insure that it is in a good state for use in the aircraft.

- On completion of the refuelling operation confirming that quality, by carrying out a further sample test

Records.

The Helicopter Landing Officer is required to keep a written record of:

- The dates and quantities of all fuel deliveries made.
- Details of all samples taken and the results of the tests carried out.
- Details of the regular maintenance and cleaning of the refuelling installation.
- These records must be retained for a period of not less than 12 months or such longer periods as the Civil Aviation Authority (CAA) may require in any particular case.

Cap 434 Aviation Fuels At Aerodromes.

This publication is issued by the Civil Aviation Authority and will give guidance on the duties of the person with the responsibility for the operation of the refuelling installation, as detailed by the Offshore Installation Manager which may be summarized as ensuring that:

- The correct quality control and fuelling procedures are carried out safely and efficiently.
- Sampling and testing of the aviation fuel, and the inspection of the fuel installation is correctly completed and that records are kept.

Refuelling Duties.

Under the offshore installation manager, and the Helicopter Landing Officer, there are additional duties which may be allocated to other personnel, such as:

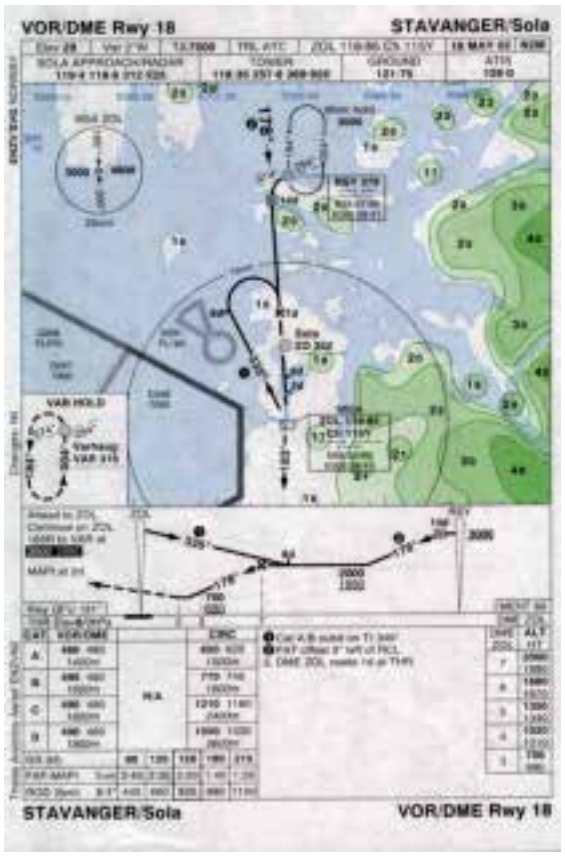
- Equipment quality control.
- Fuel quality control.
- Refuelling operations.

The Helicopter Landing Officer (HLO) and Helideck Assistants. (HDA) must have sufficient knowledge to understand and carry out these duties safely and efficiently.

Norway

Which Laws Apply?

Operational requirements and special regulations covering helicopter landing facilities on offshore drilling and production platforms are laid down by the:
Norwegian Civil Aviation Administration (NCAA) - "Regulations Bsl D 5-1"
Norwegian Petroleum Directorate (NPD) - "Regulations For Helicopter Decks On Drilling Platforms under the supervision of Norwegian Petroleum Directorate"
Norwegian Maritime Directorate (NMD) - "The Maritime Directorate Regulations issued under the authority of the Ministry of Industry and Handicrafts"



The Norwegian Civil Aviation Administration Regulations Bsl D5-1

(See also the Norwegian supplement if issued)

Responsibility

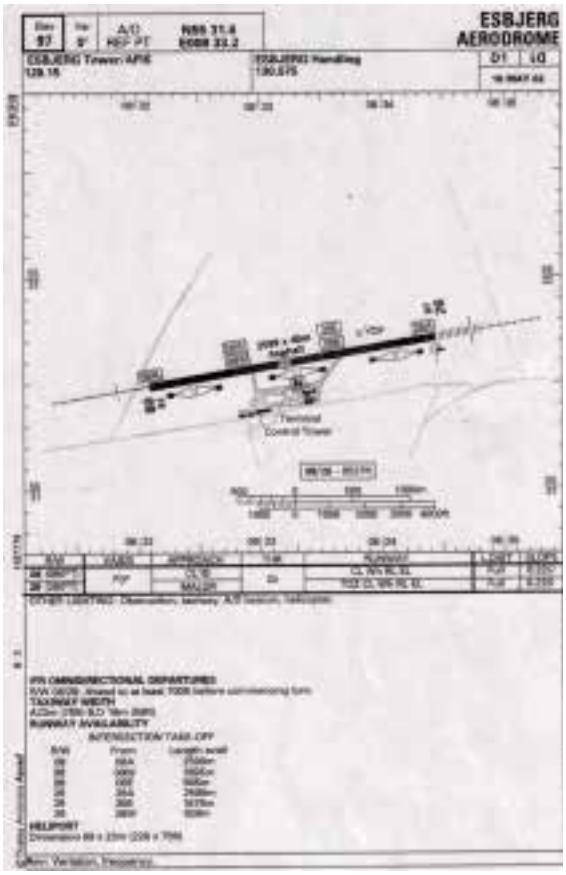
Article No 8 of the above law requires that one individual shall be responsible for operations conducted on the helideck. It will be his responsibility to insure that:

- instructions are provided to insure that the helicopter deck is clear of personnel, loose objects etc. Prior to the landings and take off.
- all equipment is in the proper position, and in good working order.
- precautionary instructions are furnished, relative to possible emergency situations and incidents.
- the personnel concerned with the helicopter operations have been given instructions and training in helicopter fire fighting and rescue procedures.
- passengers are provided with guidance during embarkation and disembarkation, covering the safe areas and procedures involved in operations with the different types of helicopters in use.

The Civil Aviation Administration is to be notified of the identity of the individual having this responsibility on board the offshore installation. The instructions and procedures governing all normal and emergency situations on the helicopter deck should be approved by the Civil Aviation Administration before the helicopter deck is accepted as ready for helicopter use.

Maritime Directorate Regulations.

The Maritime Directorate Regulations are issued under the authority of the Ministry of Industry and Handicrafts. Section No 20 of this regulation cover the maintenance and inspections of life saving and emergency equipment. Section 12 of the same regulation covers fire protection.



Denmark

Which Laws Apply?

The laws governing helidecks in the Danish sector of the North Sea are laid down in the Regulations for Civil Aviation BL 3-5

Regulations For The Civil Aviation. BL 3-5.

In pursuance of sections 52 and 70, and sub sections 10 and 13 of section 149 of the Danish Air Navigation Act No 408 dated 11 September 1985. the Civil Aviation Administration stipulates that on the authority of the Ministry of Public Works, order No 170. dated 28 April 1985, Specifications of Aerodromes. The following is a summery of the regulation documents:

- The act for the continental shelf with the latest amendments, at present the Consolidation Act No: 182. dated 1 May 1979.
- Regulations for the Civil Aviation BL 3-3. Radio Navigation and Radio Landing aids on ground, Edition No: 3. dated 1 February 1986.
- Regulations for the Civil Aviation BL 3-4. Voice recording. Edition No 2. dated 1 September 1984.
- Regulations for the Civil Aviation BL 3-6. Refuelling of Aircraft. Edition No 2. dated 15 July 1978.
- Regulations for the Civil Aviation BL 6-63. National Telecommunication License. Danish or English. Edition No 1. Dated 20 May 1986.
- Regulations on charges for the Civil Aviation Administration and the Ministry of Works. Dated 20 November 1986.

Definitions.

Helicopter Deck: Heliport on an offshore installation.

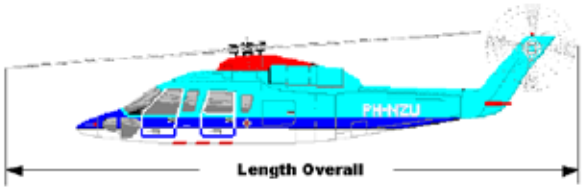
Helicopter Landing Officer: A person with special training, who is in charge of the daily work in connection with helicopter operations on an offshore installation.

Offshore Installation - Mobile: A Drilling Rig, Drilling Ship or other vessel involved in offshore work

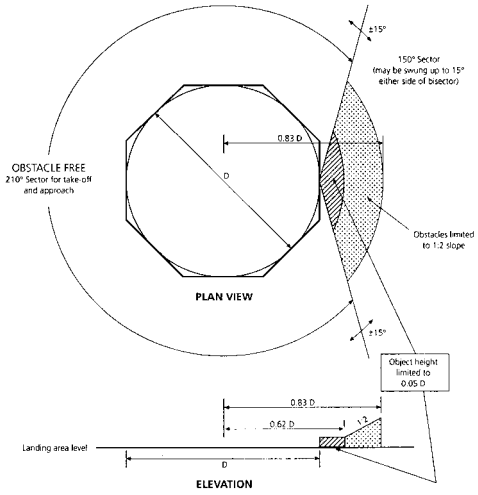
Offshore Installation - Stationary: A platform permanently located on the sea bed.

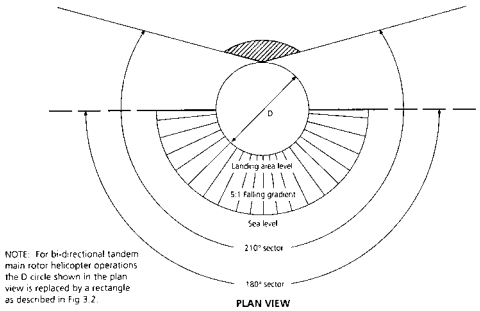
Chapter 2

Helideck Regulations



SIZES FOR :
SIKORSKY S61.N. "D" = 22.2 m.
SIKORSKY S76. "D" = 16.0 m.
DAUPHIN SA 365.N "D" = 13.7 m
SUPER PUMA / TIGER "D" = 18.7 m
EH 101 MERLIN
SAR SEA KING





Size Of The Helideck Platform And The Landing Area.

The size of the helideck platform must be large enough to accommodate at least the landing area.
The dimensions of the landing area will determine the maximum size of the helicopter that may use that platform. The landing area must be sufficiently large enough to contain a circle with a diameter "D" equal to the "Overall length" of the helicopter.
In this respect the "Overall Length" is the distance over all of the turning circles of the main and tail rotors or the rear most point of the helicopter measured in the plane of symmetry.

Obstacles With Respect To The Landing Area.

Obstacle Free Area Above The Helideck Level.

The upper side of the landing area and the horizontal area leading to it is bordered by an imaginary circle with a radius of 1000 meters. The center of this circle is situated on the arc of the inscribed circle "D".
That imaginary circle is divided into two sectors:

Sector "A" with an angle of 210°.
Sector "B" with an angle of 150°.

In sector "A" there may be no obstacles penetrating the plane of the circle "D" that are higher than 0.25 meters.

In sector "B" out to a distance of 0.62 "D" measured from the center of the helideck, objects shall not exceed a height of 1/20 "D" with a maximum height of 1.1 meters above the plane of the helideck.
Beyond that arc, out to an overall distance of 0.83 "D", an imaginary plane slopes upwards with a gradient of 1 in 2 from a height of 1/20 "D". Obstacles, situated outside the limited obstacle sector within a distance of 1/2 "D" from the edge of the helideck, must be correctly marked and provided with obstacle lighting.

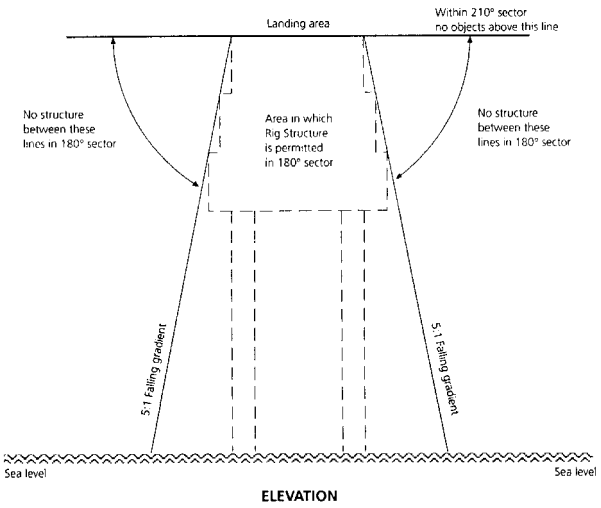
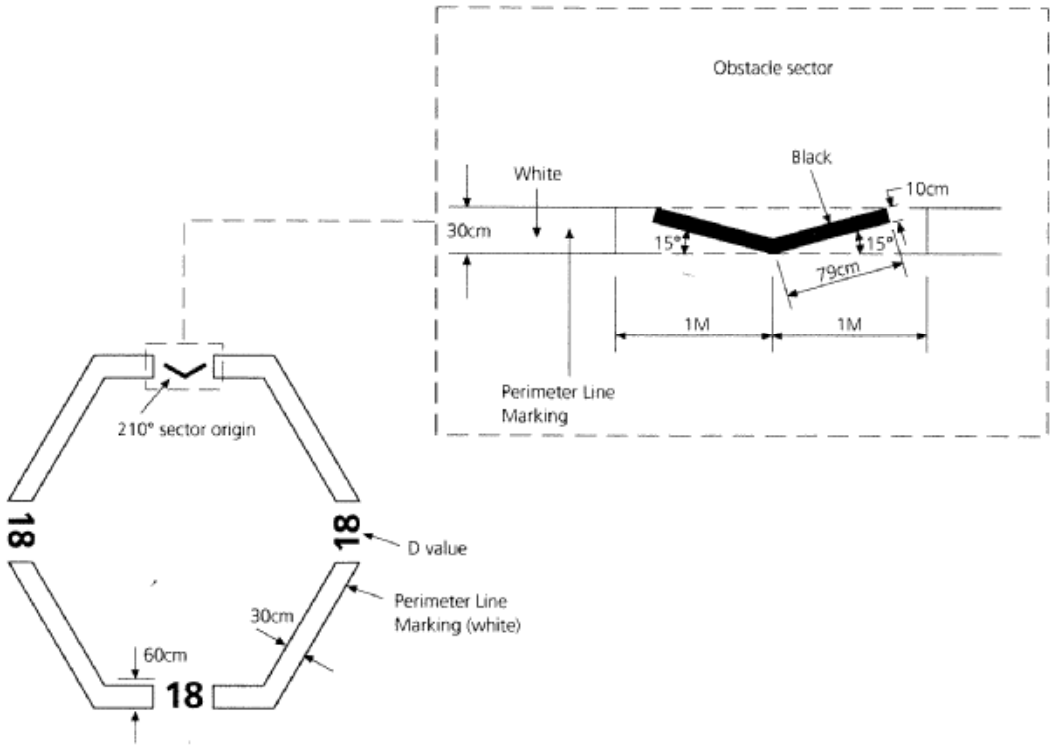


Figure 3.4 Obstacle Free Areas – Below Landing Area Level (For all types of helicopters)

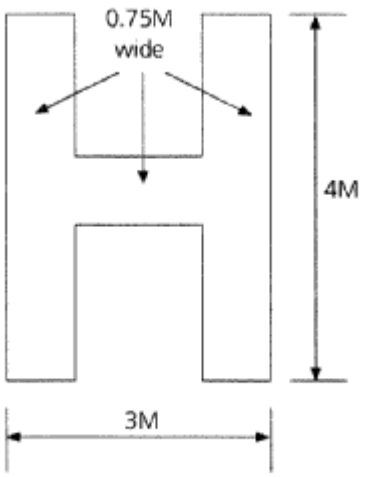
Obstacle Free Area Below The Helideck Level.

This area must extend over an arc of at least 180° with the origin at the center of the Touch down and Lift Off area (TLOF), with a descending gradient at a ratio of one unit horizontally to five units vertically (5:1) from the edge of the TLOF within that 180° sector.



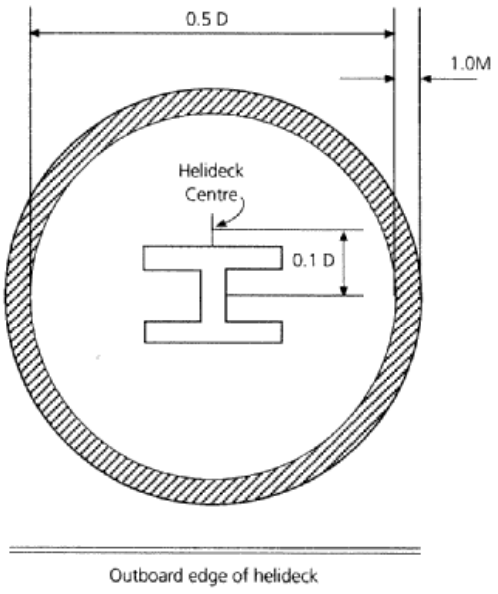
Perimeter marking showing the relationship of the "D" value and the chevron to the perimeter

The “H”



Dimensions of “H” which is to be painted white.

The Aiming Circle



Aiming circle marking which is to be painted yellow with the “H” centred in the circle

Illumination Of The Helideck And The Surrounding Area.

During the hours of darkness, and if the visibility is 1500 m or less, helideck and obstruction lighting must be switched on not less than 5 minutes before any expected helicopter operation.

Surface lighting

The landing area must have non-dazzling surface lighting (Flood Lights). They must allow the pilot to see the deck markings, not blind him.

Perimeter lighting

The regulations state that the landing area must be delineated by yellow omni directional lights, spaced at intervals of not more than three (3) meters around the perimeter of that landing area.

Obstruction Lighting

Red omni-directional obstruction lighting must be fitted to all high structures including the jibs of cranes. High obstructions should where possible be illuminated by flood lights, shinning upwards along the obstruction.

Uninterrupted Power Supply

An emergency power supply of the installation should be able, in the event of a main electrical power supply failure, to provide power to the perimeter lights and obstruction lights and, if possible, the helideck flood lighting.

The surface of the helideck and the landing area

The entire surface of the landing area, including the helideck markings, must be coated with a non slip fire resistant coating, or be treated during construction. In this context the non slip coating is for the benefit of personnel walking on the deck.

The helideck and its markings must be kept in a clean condition at all times. Bird droppings (guano) or accumulations of other befouling may obscure the markings and make it difficult for pilots to land safely, particularly during hours of darkness or poor visibility

FOD

Loose objects which could fly about under the influence of the downwash of the helicopter are referred to as FOD. (Flying/Foreign Object Damage) The landing area must be kept free of loose articles and other objects that could cause damage to the tires, floatation gear, rotors and engines of the helicopter.

The Anti Slip Net.

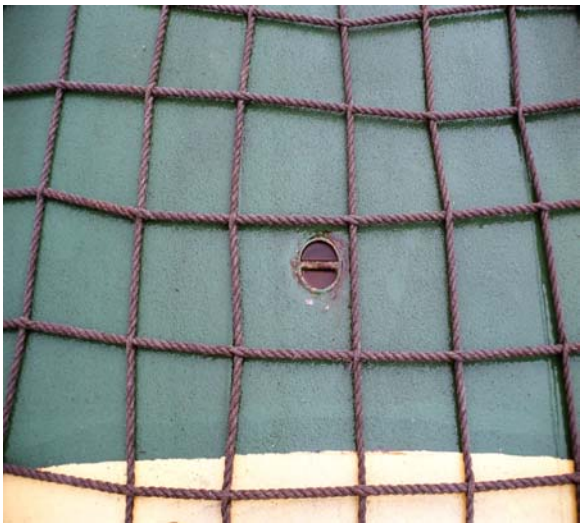
There must be an adequate friction coefficient in both wet and dry conditions to allow the helicopter to remain in one place on the deck without slipping. Particularly during engine start up and rotor engagement, the torsional loads and forces occurring may tend to cause significant movement of the Helicopter. Where the coefficient of friction is not sufficient, an anti slip net may be required to accomplish the goal.

If an "antislip net", or "landing net", is used to achieve the required levels of grip for the helicopter, it must:

- be made of manila or sisal (or other natural fibre) rope that is at least 15 mm, but not more than 20 mm, in diameter
- cover the aiming circle
- have a mesh which is not less than 200 mm and not more than 250 mm and be knotted in such a way that it cannot slide or change size
- be secured every 3.0 meters (NL) around the landing area perimeter
- be tensioned to approximately 2225 N (500 lbs). Where no device is available to test the tension a simple test may be done by standing in the middle of the net (with the feet in the mesh of the net) and lifting the net. If the net does cannot be raised more than ± 25 cm and returns smartly to the deck then the tension is considered to be adequate

Drainage Of The Helideck.

The helideck must have facilities for the safe drainage of liquids. The helideck platform should be sufficiently sloped to prevent liquids from collecting on the surface. Liquids drained from the helideck must be sufficiently well contained that they cannot flow, uncontrolled, over other parts of the installation. This is of particular importance because of the possibility of spilled fuel.



Tie Down Points.

The helideck should be provided with at least four, but preferably six recessed "tie down" points for use in securing a helicopter during extreme weather conditions, or extended shut down periods. The tie down points must be kept in a clean condition and the ring hinge points free. The Helicopter Landing Officer will be required to provide the equipment and assistance if the helicopter is to be tied down.

Clear Landing Area.

The helideck must be kept free of any snow or ice during helicopter operations. Equipment for this purpose must be available on the installation at all times.
A sea water spray is one method of quickly removing snow, ice and slush from the helideck.

Perimeter Safety Net

A safety net must be installed around the helideck, unless safety is ensured by another construction. The net should be made of fire resistant flexible material that is protected against the influences of weather, and have a mesh not more than 80 mm.
The net should be secured in such a way that its inboard edge is below the edge of the helideck and with its outboard edge at least 1.5 meters away from the edge of the helideck, sloping upwards with an angle of 10° and not exceeding a height of 0.25 m above the plane of the landing area.

This safety net must be kept in a good condition at all times, and should be strong enough that it suffers no damage when tested by dropping a 75 kg weight from a height of 1 meter.

Access To The Helideck.

The helideck must be accessible from at least two points, positioned as far as practically possible from each other. The access points must not, themselves form an obstruction or obstacle
One of these access points may be constructed as an escape route. The access points must be clearly marked, and kept unobstructed at all times.

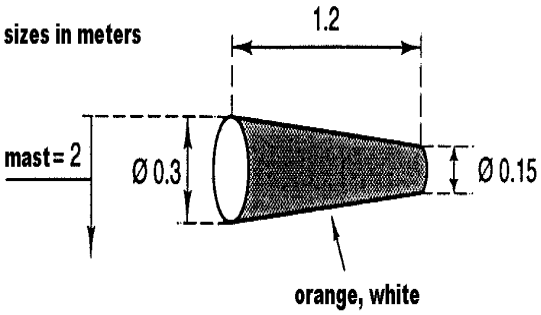
Meteorological equipment

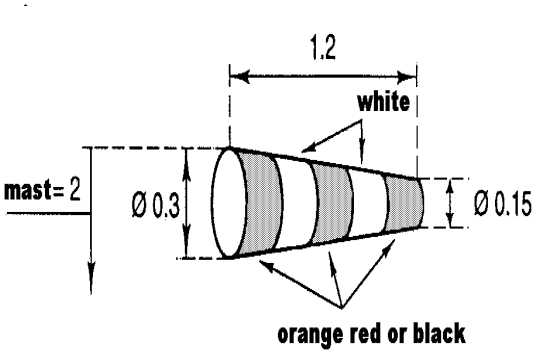
Wind Sock.

A windsock must be installed to give an indication of the direction and condition of the wind over the landing area. The windsock should be positioned in the vicinity of the helideck and be clearly visible to the pilot of the helicopter during the approach. It should not be unduly affected by turbulence.

For night operations the windsock must be clearly illuminated.

If a windsock is damaged or blown away it must be replaced as soon as possible, it is recommended that two (2) spare wind socks should be kept on the installation.





Weather instruments

Manned offshore installations must be equipped with calibrated instruments to measure the current weather conditions in order to be able to inform the pilot. The instruments must include at least:

- an anemometer - to measure wind speed and direction
- a barometer – to measure air pressure
- a thermometer – to measure air temperature

Certain installations may be designated as weather stations by the responsible governmental department. These installations will then also require calibrated instruments to measure:

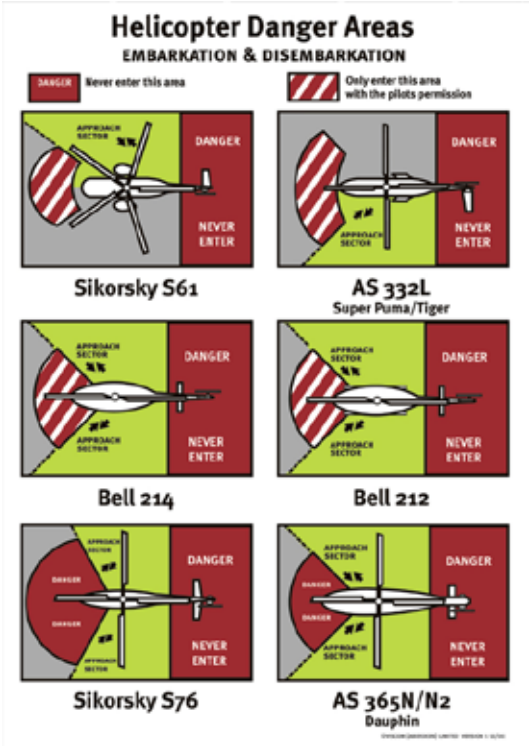
- visibility
- cloud height

Satellite platforms are sometimes exempted from the requirements if the mother platform is close by and well equipped.

Operational Equipment.

Offshore installations must have available, in the immediate vicinity of the helideck, all the equipment that will be needed for use in connection with helicopter operations including:

1. Rope or other suitable material to adequately secure the helicopter to the helideck
2. Chocks or sand bags for blocking the wheels of the helicopter
3. A scale for weighing the baggage and freight to be sent on the helicopter
4. Equipment for the clearing the helideck and the access routes of snow and ice and for keeping them clear
5. An electrical power supply for the starting of helicopter engines.
   Note:
   The requirements for the external power supply are:
   That it be able to supply 28 to 30 volts dc at 800 to 1200 amperes.
   That it be fitted with a connecting plug No CA 2551-E ("NATO" Plug)



Passenger Safe Areas.

A poster indicating the safe areas that passengers must use when leaving or approaching the helicopter should be placed in a prominent position on the installation.

Warning.
Rotor blades can and may sweep down to below shoulder height

Emergency Rescue Equipment.

The equipment which will be necessary in the event of an accident involving a helicopter must be in the vicinity of the helideck and must be ready for use. This will include at least the following items:

1. Fireman's rescue axe.
2. Hacksaw with heavy duty blades.
3. Two (2) spare heavy-duty blades.
4. Large grab hook.
5. Crash knife.
6. Crowbar with a length of 100 cm.
7. Large bolt cutter 24". (60 cm.)
8. Fire blanket.
9. Fire resistant gloves. (2 pair)
10. Safety (rescue) line with a breaking strain of 250 Kilogram, length 15 meters and 15 mm in diameter. A ladder, which is sufficiently long to reach the top of the largest helicopter, which is permitted to land on the helideck

Fire Fighting And Crash Rescue Training.

During helicopter operations the risk of fire and or crash is always present. The requirements covering the equipment and personnel are laid down in the regulations.
The training standards are laid down by in the Standards of Training Manuals as issued by the governing bodies of the country in which the operation is carried out.

Personnel Requirements.

On every manned installation, during helicopter operations there must be a number of trained persons (at least 2.) at or near the access points to the helideck.
They must be proficient in the operation and the use of the available fire fighting and rescue equipment and be standing by to render immediate assistance in the event of an accident.

Each person should be fully trained in helicopter fire fighting and rescue procedures.

Fire Fighting personnel must wear the correct protective clothing and have inspected the available equipment before the landing, ensuring that it is positioned and ready for immediate use.

Helideck personnel fall under the leadership of the helicopter landing officer

Fire Fighting Equipment Requirements.

The following fire fighting and rescue equipment must located, and be ready, for immediate use in the event of an accident involving a helicopter.
Water.

There must be sufficient water available under pressure for the purpose of producing foam.

Foam Forming Agents.

The minimum requirement for foam production is six (6) litres of the solution per minute, per square meter of the landing area, for a duration of not less than five (5) minutes.

Dry Powder Extinguishers.

There must be one (1) or more dry powder fire extinguishers having an overall capacity of not less than forty five (45) kg.

Other Extinguishers.

There must be other extinguishers having a total contents of not less than eighteen (18) kg of carbon dioxide (CO 2.). (some older decks may still have permission to substitute halogenated hydrocarbons such as Halon / BCF.)

Note.
One of these extinguishers must be fitted with an extension lance of sufficient length to enable the operator to reach the engine compartments of all helicopters permitted to land on the helideck.

Water Hoses.

There must be at least two (2) water hoses, with adjustable jet pipes, of sufficient length so as to be able to reach the interior of the helicopter at all times and in all conditions.

Ring Line System.

The foam system mentioned above may be replaced by a ring line system equipped with spray heads and situated in such a way, that the landing area can be covered with foam in all weather conditions. In such cases the two **(2)** hose lines mentioned above, must also be able to produce foam.

Note.
If the systems are filled with "film forming foam" the quantities may be reduced by one third.

Care Of The Fire Fighting Equipment.

All of the above mentioned equipment and the emergency equipment container, must be kept in good condition at all times. Special attention being paid to corrosion, damage to hoses and weather protection. The foam fire fighting equipment should be tested at regular intervals.

Special note.
After testing the foam fire fighting equipment ensure that the lines are flushed clean and if connected to a fresh water system drained during the winter months to prevent any chance of the water freezing.

Safety Notice Boards.

At the access points to the helideck there should be Notice Boards prominently placed and written in the languages that are normally spoken on the platform. But at least in the English language.

"Safety Notice Boards" should contain at least the following:

Safety Notice Board.

No smoking.

Beware of the tail rotor.

Use the safe approach routes.

Do not approach the helicopter while the Anti collision lights are flashing.

No hard hats without chin straps secured.

No loose head gear.

Prevention Of Bird Strikes.

Bird strikes in the vicinity of airports and offshore installations is an increasing problem in aviation. The danger of birds being sucked into engine intakes or hitting rotor blades is very real. This can cause damage to the engines or the rotor blades. In extreme situations there is the danger to passengers and crew of the helicopter. An offshore installation can be a very attractive resting place for birds, giving shelter and in some cases food. In order to help in the prevention of bird strikes, the following actions are recommended:

1. Stop the dumping of food waste overboard.
2. Keep waste food containers covered and the surrounding area clean at all times.
3. When fishing do not throw the unwanted fish back into the sea.
4. Searchlights moved from side to side can help in clearing the helideck prior to the landing.

Warning note.
Always warn the pilot of a visiting helicopter if there are birds in the vicinity of the helideck.

External Electrical Power Supply For Engine Starting.

With some helicopters types it is required that after a shut down, an external electrical power supply (GPU or EPU) of 24 to 30 volts DC is available to assist in re starting the engines. At present, the following types of external power units are in use for engine starting.

A set of two 12 volt batteries, wired up in series to provide 24 volts (180 AH and a maximum output of 570 Amps per battery). This voltage is only acceptable for the smaller helicopters.

A set of two 12 volt batteries, plus one 6 volt battery, wired up in series to provide 28 to 30 volts DC (160 AH and a maximum output of 200 amps for the 6 volt battery, and 180 AH and a maximum output of 570 amps for each 12 volt battery)

The preferred system is a transformer rectifier, capable of supplying 24 to 30 volts DC, 800 to 1200 amperes continuous output.

All external power supply units must be fitted with an adapter plug for the helicopter. The number to be used when ordering the plug is CA 2551-E. The plug is available from most helicopter operators.

Weighing Scales

Commercial scales for the weighing passengers, baggage or cargo that is to be transported in the helicopter, must be available on board the installation or vessel. The scales should be regularly checked to ensure that the readings are correct.

Mobile Helidecks

Pitch And Roll Of The Helideck.

Mobile platforms, such as pipe laying and other vessels, construction barges and in some cases drilling installations. Must have instruments on board to give a good indication of the movement of the helideck.

The limitations of helideck movement during helicopter operations are:

- Pitch = + 2° to -2°.
- Roll = 5° left to 5° right.
- Heave = 2.88 ft per second.

Location of The Helicopter Landing Platform (Helideck).

The location of the helideck in relation to the main structure of drilling installations may have an effect on the payload of the helicopter. The prevailing wind direction and speed in relation to the helideck may also affect the operational capabilities of the helicopter.

In extreme conditions of high wind speeds, and where the direction of the wind is such that it first passes over the main structure of the installation and then over the helideck, the turbulence may affect the permissible "take-off weight" of the helicopter.

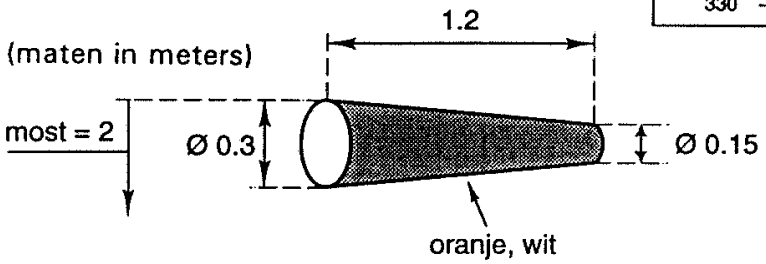
For this reason the helideck should be positioned in "free air". The helideck should be located on the windward side of the installation, based on the known direction of the prevailing wind direction, with the deck heading oriented perpendicular to the prevailing wind

Bijlage I

Behoort bij de artikelen 4 en 9 van de Nadere regelen Mijnreglement continentaal plat helikopterdekken.

Grootste afmeting	Bandbreedte (x).
1,5 – 210 m	1/7 x grootste afmeting
210 – 270 m	1/9 x " "
270 – 330 m	1/11 x " "
330 – 390 m	1/23 x " "

(maten in meters)



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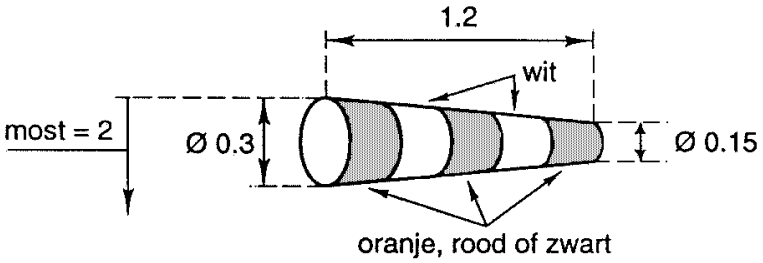

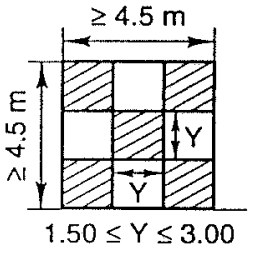

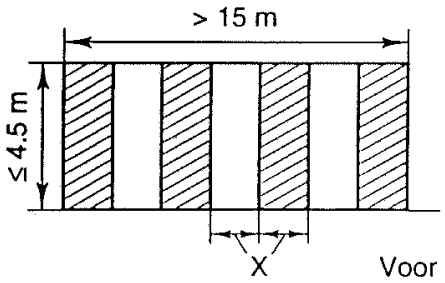

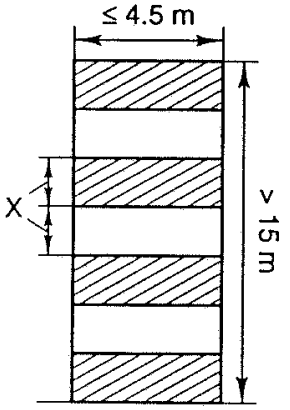

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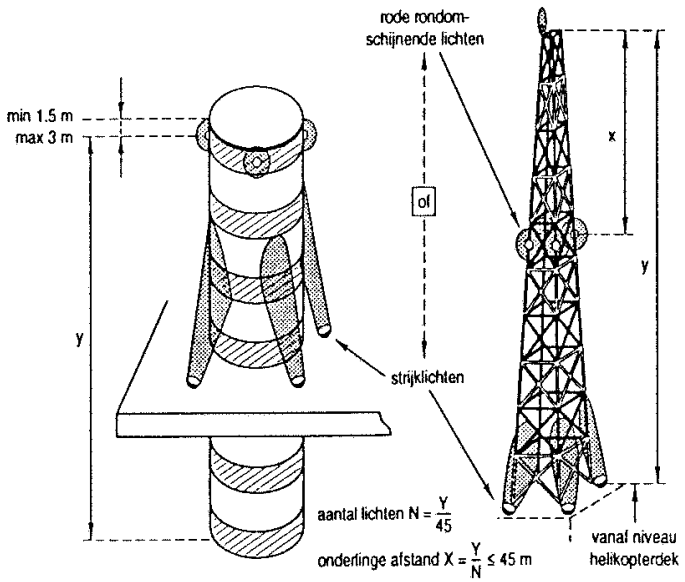


Chapter 3

Standard Operating Procedures

Introduction.

Helicopter safety is the concern of all personnel involved in helicopter operations. The helicopter landing officer can make his particular contribution to safety with helicopters, and safety in general, by his good example. This includes:

- his ability to act as a leader of a team that will work for and with each other to ensure a safe and efficient operation.
- his ability to act as a source of information concerning helicopter operations
- instilling safety awareness to installation staff and passengers
- his ability to assist the helicopter crew
- his ability to respond quickly and efficiently to any emergency situation

Duties of the Helicopter Landing Officer.

The regulations define the responsibilities of the Helicopter Landing Officer, but do not necessarily name all of his duties. The allocation of the duties and tasks to the Helicopter Landing Officer is the responsibility of the Offshore Installation Manager. This will depend on the operating company organization, together with the requirements of the helicopter operator.

Related Duties.

There are a number of duties that may be carried out by a person or persons working in support of the helicopter activities. All personnel, when carrying out such duties should be under the direct control of the Helicopter Landing Officer.

Helicopter Landing Officer: A "Job Description".

The Helicopter Landing Officer must have read and understood the emergency procedures manuals of the company operating the offshore installation or vessel. In some cases the helicopter operator will also provide special instructions for helicopter operations. The HLO must ensure that the helideck crew complies with these procedures.

"During helicopter operations, (the HLO) must be present on the helideck and must be clearly identifiable as such by the wearing of a reflective vest upon which the letters HLO are present on the front and back."
Translated from Dutch Aviation Airlaw

The basic duties of the Helicopter Landing Officer are as follows:

- Control the movement of all personnel on, and in the direct vicinity of the helicopter landing area. This also includes disembarking and embarking passengers in cooperation with the helicopter crew.
- Control of the loading and unloading of cargo on instructions of the helicopter crew.
- Control of the refuelling of the helicopter in accordance with the requirements of the helicopter Captain.
- Daily control of the aviation fuel quality and the refuelling installation.
- Provision of manifests for passengers and cargo, and the required documentation for the safe transport of special loads.
- Maintenance of the required administration.

Note.

This handbook, and the training course for which it is intended, include information that is required for the helicopter landing officer to carry out his duties correctly, efficiently and safely. But always remember that company regulations and requirements have priority and that the company must approve any changes.

Routine Precautions

When a helicopter has landed on the helideck there are a number of routine precautions that must be observed by all personnel involved in the helicopter operation:

Approaching the helicopter:

Only approach the helicopter when the "Anti-collision Light(s)" have been switched "Off".(see Chapter 9 for location(s)) This will indicate that the pilot is satisfied that it is safe to approach the helicopter via the designated approach areas. The pilot will normally confirm this by giving a hand signal "Thumbs Up".

Note.
The helicopter "Anti-collision Light" (or lights), will remain "on" if the pilot feels that it is hazardous to be on the deck. The pilot will switch "on" the anticollision light if at any time he decides that it is, or may become, hazardous to be on the helideck. This procedure is, by agreement, standard in the North Sea Area. It is not standard in other areas. In these areas the hand signal may be the only indication which the HLO can expect.

Rotor blades:

The different forces of air produced by the turning rotor blades can blow off helmets etc. and lift loose articles into the air. These can damage the rotor blades or get sucked into the motors. Keep the helideck and surrounding areas clear of loose objects that could become airborne. Use only headgear that cannot blow off.

Remember that rotor blades may at any time sweep down to below shoulder height. One can minimise the risk by using the designated "Safe Areas".

Static electricity:

Ensure that during the refuelling operation the correct bonding procedures are carried out at all times.

Note:
Static electricity may also be present during operations with underslung loads and when working with the personnel winch.

Engine air intakes and exhausts:

Stay well clear of the engine air intakes and exhausts at all times. Check passengers for loose articles or open bags. Polythene bags and bin liners are not allowed on the helideck.

Fire fighting equipment:

Helideck fire fighting equipment must be ready for use at all times during helicopter operations. It is the responsibility of the Helicopter Landing Officer to ensure that the periodic tests have been carried out at the required times, and that the equipment certifications are within date. This is not to imply that he must carry out the inspection, rather that he must check that it is done.

Floatation gear:

Stay clear of the flotation gear where possible. The positions of the floatation gear can be found in chapter 9 of this handbook.

High wind conditions:

Passenger safety is of prime importance at all times, but special care must be taken during periods with high wind speeds over the helideck. It may be necessary to use guide lines, or other methods, to ensure passenger safety. Do not leave doors open unattended.

Guidelines:

If guidelines are used to provide a handrail for passengers, fasten them to the tie down points or to the antislip net. Do not fasten them to the helicopter. Should guidelines to be considered necessary, rethink the need for the helicopter landing under these conditions.

Passenger Information:

The HLO would normally be expected to ensure that the passengers have been properly briefed. The passenger should normally see the "passenger briefing film" before every flight, unless the flight is the continuation of a flight within the last 24 Hours in the same type of aircraft. Commonly, someone else carries out the task. e.g. the medic or radio operator.

Before The Flight:

The passenger briefing video should be shown before each flight, unless the flight is continuing with the same aircraft and the same passengers within 24 hours.

During The Flight:

Safety features cards are available in the helicopter to inform the passengers of the available emergency facilities. During the flight, passengers are required to follow the procedures as laid down by the helicopter operator, and in particular to follow any instructions given by a member of the helicopter crew.

The Helideck crew cannot be expected to supervise the passengers during the flight. However, on flights without a flight attendant on board, the deck crew is in a better position than the aircrew to ensure that the passengers at least start the flight correctly. It is important that the helideck crew checks and, where necessary, corrects the passengers on a number of points:

Seat belts:

Seat belts must remain fastened at all times during take off and landing. Seat belts should remain fastened until the illuminated "fasten seat belts" sign has been switched off, or the cabin door has been opened by the crew or the Helicopter Landing Officer.
The exception to this situation occurs during "rotors running refuelling" with passengers on board. In this situation the seat belts should be left open and doors open where possible or at least unlocked.

Smoking:

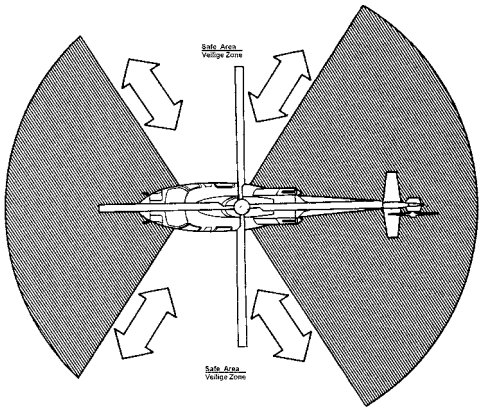
The "No Smoking" sign must be observed at all times.

Survival suits.

Most oil companies issue survival suits to be worn during the flight. These suits must be worn correctly to function properly. Check that the passengers have donned there suits properly, following all of the instructions, ensuring that the zipper is closed to a position above the life jacket fastener and that a hood, if fitted, is over the neck of the life jacket.

Unusual occurrences:

Any unusual occurrences, such as noises, leaks or smells should be reported to a member of the helicopter crew immediately.



After The Landing:

Passengers must remain seated with their seat belts fastened. The seat belts may only be released when the cabin door has been opened by a member of the helicopter crew or by the Helicopter Landing Officer, or the illuminated "fasten seat belts" sign has been switched off.
When leaving or approaching the helicopter, passengers must use the designated "preferred approach routes ".

Recommended Checklists for the Helicopter Landing Officer.

The following checks are recommended as a general guide for the Helicopter Landing Officer, to assist him, or her, in the daily duties concerning the helicopter operations to and from his, or her, installation, or vessel. The Helicopter Landing Officer normally carries out most of the checks, but some checks may be carried out by other personnel under his, or her, direct control.

The Helicopter Landing Officer and his, or her, crew must know the characteristics of the helicopters that will visit their installation, be well acquainted with the helicopter safety instructions, and understand the emergency procedures as laid down by their own company and the regulatory authorities.

Note:
The position of the helicopter emergency exits /entrances etc. are shown in chapter 9 of this handbook.

Daily Checks of Equipment and Facilities.

The helicopter deck and landing area must be checked each and every day, ensuring that all the required equipment and facilities are available and in a serviceable condition. Any discrepancy should be recorded in the "Discrepancy Log Helicopter Landing Facility" and be corrected as soon as possible. It is also suggested that a part of that log be set aside for recording any occurrences or incidents that may occur during the helicopter operations. The following is a suggested list of the items that are to be checked on a routine basis:

- General condition of the landing area
- Condition and tension of the landing net
- Condition of visual aids, marking, lights, and illuminated windsock
- Condition of perimeter safety nets
- Deck (operational) equipment including helicopter starting equipment
- Emergency equipment
- Refuelling facilities (if appropriate)
- Availability of fire fighting equipment
- Safety notices
- Effect of bird droppings

Pre Landing Checks:
The Following checks should normally be carried out prior to a helicopter landing:

Checks 30 minutes before the landing.

- Obtain arrival information from the installation Radio Operator or via the land line from the "Mother Platform" this information should include:

  - ETA (Estimated Time of Arrival)
  - Number of persons on board the helicopter.
  - Number of incoming passengers. Amount of cargo.
  - Refuelling? yes or no.
  - Shut Down? yes or no.
- Ensure that the "landing area" and the "Helideck area" are clear of any loose articles or obstructions etc.
- Check for the availability of fire and emergency rescue equipment and, if required, the external power supply.
- Check the "anti slip net" if installed for condition and security.
- Fire and crash rescue team to be alerted and on standby, dressed in the correct protective clothing.
- Deck and obstruction lighting (for night ops)

Note.

In certain conditions it is required that helideck area be checked for the presence of gas or other flammable substances, also the air temperature above the helideck may require checking. If the temperature is found to differ from the temperature as indicated in the radio room by 3°c or more, the pilot of the visiting helicopter must be informed.

Checks 10 Minutes Before The Landing.

- Inform all the crane operators of the impending arrival, ensuring that the cranes that have operating areas that may obstruct the landing path, landing area, the overshoot area or the stability of the helideck are shut down and parked clear of those areas.

Note.

If due to operational requirements a crane must remain in operation the pilot of the visiting helicopter must be informed. The pilot will then decide if the landing can be carried out.

- Deploy the fire fighting equipment, unlock (if locked) the emergency rescue equipment
- Ensure that the fire and rescue team is ready for the landing.
- Restrict all access to the landing area.
- If fuel is required, ensure that the fuel documents and sampling equipment are available for use.
- Ensure that the supply vessel or stand-by boat has been informed of the impending arrival and is in position.
- Check immediate vicinity of helideck for presence of birds, showers and low clouds
- Check wind direction and speed

Checks Immediately Before The Landing.

- Confirm that crane operations have ceased.
- Ensure that the landing area is clear of all personnel.
- Deploy the fire and rescue personnel to a protected position.
- Ensure that at the moment of the landing all helideck personnel are in a protected position.
- Transmit deck status to pilot when requested ("The deck is clear for landing")

Procedures After Landing:

In general, during helicopter operations, the HLO should position himself, as much as possible, outside the rotor field and in view of both the pilot and the deck crew. This places him in a good position to supervise the activities of the helideck crew and to communicate with the aircrew and the helideck crew

Rotors Running Turnaround.

- Wait until the rotating or flashing "Anti Collision Light" or lights have been switched "OFF", and the pilot confirms with a hand signal that it is safe to approach.
- When requested by the pilot, instruct an HDA to place wheel chocks in front of, and behind, the main wheels of the helicopter.
- Exchange manifests with the pilot.
- Instruct an HDA to remove baggage cargo and mail etc.
- Disembark the passengers under the guidance of the Flight Attendant. (see note)

Note.
If there is no flight attendant on board the helicopter, the helicopter landing officer will carry out the duties of opening cabin and baggage compartment doors.

In operations without flight attendants the helicopter landing officer will, after opening the doors, position him or herself where he can see the pilot, the deck crew and the passengers. (usually outside the rotor area)

- If refuelling is required follow the helicopter refuelling instructions. (see chapter 8)
- Embark the out-going passengers. HDA(s) will help with the guidance of passengers and the loading of baggage. (see above note).
- Clear the landing area of all personnel with the exception of the deck crew.
- When requested by the pilot instruct an HDA to remove wheel chocks.
- Check that all passengers are correctly seated with life jackets and seat belts on.
- Check that all doors and hatches are closed.
- Check that the landing area is clear.
- Inform the pilot via the radio or with hand signals that the "helideck is clear for take off".
- Advise the Radio Operator when the helicopter operations have ceased and the helideck is clear of all personnel

Landing With a Shut Down.

- Wait until the rotating or flashing "Anti Collision Light", or lights, have been switched "OFF", and the pilot confirms with a hand signal that it is safe to approach.
- When requested by the pilot, instruct an HDA to place wheel chocks in front of, and behind, the main wheels of the helicopter.
- Return to the safe position
- Wait until the helicopter has been completely shut down
- Disembark the passengers and baggage, and remove any incoming cargo or mail.
- If aviation fuel is required follow the "Helicopter Refuelling" instructions.
- At least one HDA should remain on the helideck until all members of the helicopter crew have completed their inspections and tie down.

Helicopter Tie Down Procedures.

Under some circumstances, during a shutdown offshore it may be necessary to tie the rotor blades and /or the helicopter down. The helicopter crew is responsible for all aspects of tying the helicopter down. Equipment for securing the rotor blades is carried in the helicopter. Equipment for securing the helicopter to the deck may not be. Rope for use in tying down the helicopter should be available on all offshore installations or vessels involved in offshore operations. It is suggested that 5 lengths of rope +/- 1,5 cm thick and 5 meters long should be available as part of the helideck equipment. The helicopter crew may request assistance in tying down the helicopter.

Helicopter Start Up Procedures.

- On completion of loading passengers and cargo, hand the out going manifests to the pilot.
- Clear the helideck of all personnel with the exception of the deck crew.
- When requested by the aircrew, instruct an HDA to connect the external power supply.
- Stand-by for engine start up.
- Ensure that an HDA is alert for a possible engine fire during the start up.
- Ensure that the deck crew remain clear of the rotor sweep area.
- Follow the pilots instructions during the start up procedure. Watch the engine being started for signs of engine fire.
- On a signal from the pilot, have an HDA remove the external power cable and close the protective cover.
- On a signal from the pilot, have an HDA remove the wheel chocks.
- Check that all passengers are correctly seated with life jackets and seat belts on.
- Check that all doors and hatches are closed.
- Check that the landing area is clear.
- Inform the pilot via the radio or with hand signals that the "helideck is clear for take off".

Advise the Radio operator when the helicopter operations have ceased and the helideck is clear of all personnel.

Chapter 4

Emergency Procedures

Helideck Emergency Procedures.

It is vital that the Helicopter Landing Officer has well established procedures to deal with any emergency that may arise. Special attention must be paid to the Company Emergency Procedures Manuals to co-ordinate an efficient system of covering all emergency situations.
The following steps may help in improving the existing procedures or in developing new procedures for the helideck operation:

A. Assessment of potential emergency situations.
B. A plan of action to contain that situation.
C. Assessment of equipment that may be required to meet the plan of action. The above suggestions must be for the specific situation at your present platform, as each platform has its own particular set op. The situations at other platforms or on board a vessel will differ in many ways.

Plan Of Action.

It is important to have a plan of action ready for any of the aforementioned situations, such a plan should include items such as:
1. Alerting of personnel.
2. Briefing of personnel.
3. Methods of communication.
4. Positioning of equipment.

Examples Of Potential Emergency Situations.

1. Fire during the refuelling operation.
2. Engine fire during start up.
3. Obstructed or damaged helideck.
4. Helicopter heavy landing developing into a fire situation.
5. Helicopter ditching near your installation.
6. Fire alarm on an other part of the installation during helicopter operations.
7. Man overboard alarm during helicopter operations.
8. Evacuation of the installation.
9. Evacuation of an installation close to your own.
10. Transport of sick or injured personnel.
11. Excepting survivors from another installation or vessel.

Note.
Special attention must be paid to dual responsibilities of the personnel involved in the helicopter operation. If helideck personnel have other special duties priorities must be established.

Activation Of Installation Alarms During Helideck Operations

Action during helicopter approach

- The HLO advises the Pilot of the situation and requests that he does not land but remains in the vicinity to await further instructions. He should also advise the pilot if there is any possibility of gas being vented.
- The HLO and helideck crew then proceed to their primary muster stations

Action after helicopter lands

- The HLO advises the pilot of the situation and if there is any possibility of gas being vented. Dependent on the point reached in the disembarkation process, the Pilot then decides whether to take off again or shut down.
- The HLO and helideck crew continue with the disembarkation/ embarkation procedures until such time as a take-off or shutdown can be undertaken safely.
- If the helicopter takes off, the helideck crew ensures that any newly arrived passengers are directed to their muster stations.
- If the helicopter shuts down, the helideck crew proceed to their primary muster station after shut down and the HLO instructs the Pilots and passengers to remain on board the helicopter. He then proceeds to his muster station and informs the person completing the POB checks of the number of personnel in the helicopter.

Action during refuelling

- The HLO advises the Pilot of the situation and instructs the refuellers to stop pumping and to retract the fuel delivery hose. The Pilot decides to take off again or to shut down.
- If the helicopter takes off, the HLO and helideck crew proceed to their primary muster stations after take off.
- If the helicopter shuts down, the helideck crew proceed to their primary muster stations after shut down and the HLO instructs the Pilots to remain on board the helicopter. He then proceeds to his muster station and informs the person completing the POB checks of the number of personnel in the helicopter.

Fire on helideck during refuelling operation

- The HLO instructs the refuellers to stop pumping and retract the delivery hose. Sound the alarm and inform the radio operator or the control room about the emergency, if this can be done immediately.
- Active the fixed fire fighting equipment (if installed). Determine the source of fire.
- Use fire hoses with powder or foam and close in the fire as quickly as the situation allows. Suppress the flames surrounding the cabin area and cockpit, making a breathable atmosphere for any trapped personnel.
- Immediately fight the fire in the vicinity of the fuel tanks.
- In some cases it will be possible to rescue the helicopter crew and passengers before the fire becomes too violent. If a rescue looks possible it should be attempt, but use fire fighting action to cover personnel in the rescue attempt.

Helicopter heavy landing or crash on the helideck

- In the event of a helicopter crash on the helideck following immediate action shall be taken,
- The HLO sounds the alarm and advises the radio operator or control room about the emergency as soon as possible. Co-ordinate the fire fighting and rescue to save human lives and control the fire.
- If no fire is visible, but fuel or other liquids leak from the helicopter, this liquid shall be covered with a foam blanket.
- Helicopter ditching near installation
- Immediately inform the radio operator or control room. The radio operator will follow the installation contingency plan, saying that assistance shall be given immediately.
- The nearest stand-by boat will immediately assist. The helideck crew will follow the instruction given by the OIM primary to rescue the occupants, secondary the helicopter.

Injuries to helideck crew

If a member of the helideck crew has been injured, no helicopter shall receive "clear deck", until the injured person has been replaced. Inform radio operator or OIM about the injury, the radio operator or OIM will then see that the injured person is replaced and inform the helicopter crew.

Evacuation of the installation by helicopter

In the event of evacuation by helicopter, the HLO and deck crew shall leave their muster station when instructed by OIM and proceed as follows:

- Prepare helideck to receive aircraft. Establish payloads as each aircraft approaches and inform administration of the number required on deck. As each helicopter lifts off, report to administration the number of evacuees lifted off.

Man over board alarm during helicopter operation

A helicopter is always useful to assist in search and rescue operation. The crew and even the passengers are in a better situation to locate survivors in the water

- If a helicopter is on deck, be prepared to assist the aircraft when requested. If no helicopter is on deck, call in the nearest helicopter in the vicinity of the installation

Gas flow warning

On off-or on shore installations there is a possibility of a sudden activation of a gas blow-out system. As this gas is highly explosive, helicopter operations are prohibited on this installation during such a gas flow. The helicopter crew must be warned by the radio operator and by flashing warning light situated beside the helideck

Oil well perforation

During perforating operation activities electrically activated perforating guns are used to penetrate well casings. Before any explosive device is armed, all radio transmitters on the installation must be switched off and the installation enters a status of radio silence. The helicopter operator and helicopter crew must be informed of this situation.
The Institute of Makers of Explosives has determined the minimum distance between "shotpoint " and "transmitter" which in connection with helicopter activities equated to a minimum approach distance of 500 meters. (minimum altitude 1500 ft.)

Obstructed or damaged helideck

The helicopter operator and helicopter crew must be informed of this situation, and no helicopter shall receive "clear deck".

Selection Of Equipment.

Each installation has basic emergency equipment as stipulated by the law. Extra requirements may include such items as:

1. Hand held search lights.
2. Ropes.
3. Ladders.
4. Stretchers.

Safety Meetings.

Use the helicopter operation as a regular subject for safety meetings. Regular contact with the company safety officer will also assist in maintaining a safe and efficient helicopter operation.

Chapter 5

Communications

Communication responsibilities of the helicopter landing officer.

Scope of responsibility

Before and during the helicopter operations the Helicopter Landing Officer has to maintain good communications by one of the following methods:

A. Radio messages.
B. Light signals.
C. Hand signals.
D. Voice.

with possible one or more of the following:

- Offshore Installation Manager or Ships Captain.
- Radio operator.
- Helicopter pilot.
- Helicopter crew when on the helideck.
- Crane operators.
- Standby vessel.
- Fire and rescue crew. (HDA)
- Refuelling crew.
- Loaders.
- Passengers.

Communication By R/T. (Radio telephone)

Where possible the Helicopter Landing Officer should be equipped with a portable transceiver set, operating on the same VHF frequency as the pilot of the visiting helicopter
and the Radio Operator. (RO)

To achieve this Helicopter Landing Officers will be required to learn the correct
"Handover procedures" to be used when the handover is made from the installation Radio Operator or the Radio Operator of the controlling platform to the Helicopter Landing Officer, and vice versa, including the limitations in the use of the radio.

In general the Helicopter Landing Officer may only use his or her radio in very limited context. eg. Deck clearance etc. and if required any emergency information.

Note.
Do not occupy the frequency for loading instructions and other non-important messages

R/t handover procedures.

The Helicopter Landing Officer may only act in advisory capacity eg. "Deck clear" or "Your Undercarriage is not down".

Warning.

Radio operators and helicopter landing officers will not assume the authority of air traffic control, but will only act in an advisory capacity.

Correct handover procedures between the Radio Operator and the Helicopter Landing Officer must be followed at all times.

During the approach of the helicopter, at approximately three (3) minutes before the landing, the Radio Operator will advise the Pilot as follows:

Example:
Radio operator.:
"Heli wun (one) this is (platform name) call landing officer for deck clearance."

The Pilot of the visiting helicopter will call the Helicopter Landing Officer with the request for deck clearance and, if the helideck is clear for landing, will receive the following answer:

Helicopter landing officer.
"Heli wun (one) landing officer (platform name) helideck is clear.
Land at your own discretion."

The procedures for the departure should be, that the Helicopter Landing Officer, after checking that the doors and hatches of the helicopter are closed and that the helideck is clear of equipment and personnel:

Helicopter landing officer.
"Heli wun (one) this is (platform name) landing officer helideck is clear.
Take off at your own discretion. Call (platform name) Radio operator when airborne."

Phonetic alphabet.

When transmitting an helicopter call sign or spelling words the "Phonetic alphabet" must be used at all times.

A:	Alfa.	J:	Juliet.	S:	Sierra.
B:	Bravo.	K:	Kilo.	T:	Tango.
C:	Charlie.	L:	Lima.	U:	Uniform.
D:	Delta.	M.	Mike.	V:	Victor.
E:	Echo.	N:	November.	W.	Whisky.
F:	Foxtrot.	O:	Oscar.	X:	X ray.
G:	Golf.	P:	Papa.	Y:	Yankee.
H:	Hotel.	Q:	Quebec.	Z:	Zulu.
I:	India.	R:	Romeo.		

Phonetic numbers.

When transmitting figures, the following pronunciation must be used:

0:	Ze-ro.	1:	Wun.	2:	Too.	3:	Tree.
4:	Fow-er.	5:	Fife.	6:	Six.	7:	Seven.
8:	Ait.	9:	Nin-er.				

All numbers except whole thousands, shall be transmitted by pronouncing each digit separately. Whole thousands shall be transmitted by pronouncing each digit in the number of thousands followed by the word thousand, pronounced "Tou-sand".

Examples.

10.	Transmitted as = Wun Ze-ro.
75.	Transmitted as = Seven Fife.
100.	Transmitted as = Wun Ze-ro Ze-ro.
1000.	Transmitted as = Wun Tou-sand.
38143.	Transmitted as = Tree Ait Wun Fow-er Tree.

The word DECIMAL should be used to indicate a decimal point:

129.5. Transmitted as = Wun Too Nin-er Decimal Fife.

All numerals, or messages containing numerals should be repeated back at all times

Readability scale.

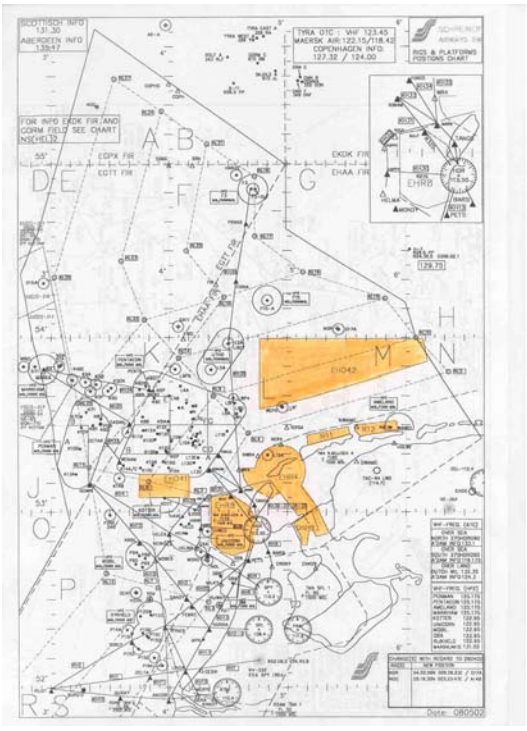
The following scale should be used when reporting on radio strength and clarity:

STRENGTH	1.	=	Means unreadable.
STRENGTH	2.	=	Means readable intermittently.
STRENGTH	3.	=	Means readable with difficulty.
STRENGTH	4.	=	Means readable.
STRENGTH	5.	=	Means perfectly readable.

Standard words and phrases.

The following list of words and phrases should be used during normal radio communication procedures.

WORD OR PHRASE.	=	**THE MEANING.**
ACKNOWLEDGE:	=	Let me know that you have received and understood the message.
AFFIRM:	=	Yes.
APPROVED:	=	Permission for proposed action granted.
BREAK:	=	Indicates the separation between messages to different stations.
CANCEL:	=	Annul the previously transmitted message.
CHECK:	=	Examine a system or procedure.
CLEARED:	=	Authorized to proceed under the conditions specified.
CONFIRM:	=	Have I correctly received the message, or did you receive my message correctly.
CONTACT:	=	Establish contact with.
CORRECT:	=	That is correct.
CORRECTION:	=	An error has been made in this transmission, the correct version is.
DISREGARD:	=	Consider the transmission as not sent.
HOW DO YOU READ:	=	What is the readability of my transmission.
I SAY AGAIN:	=	I repeat for clarity or emphasis.
MONITOR:	=	Listen out on (frequency)
NEGATIVE:	=	No, or permission not granted, or that is not correct.
OVER:	=	My transmission is ended and I expect a response from you.
OUT:	=	This transmission is ended and no response is expected.
PASS YOUR MESSAGE:	=	Proceed with your message.
GO AHEAD:	=	Proceed with your message.
READ BACK:	=	Repeat all, or specific part, of the message.
REPORT:	=	Pass requested information.
REQUEST:	=	I would like to know, or I wish to obtain.
ROGER:	=	I have received all of your last transmission.
SAY AGAIN:	=	Repeat all after, give the last received word.
SPEAK SLOWER:	=	Reduce rate of speech.
STANDBY	=	Wait I will call you(no onward clearance to be assumed)
VERIFY:	=	Check and confirm.
WILCO:	=	I understand and will comply.



Frequencies used in the Dutch area of the North Sea.

VHF:
North of 53° North, but with the exception of blocks K18, L16 and L17.

Primary frequency = 125.175 MHz.
Secondary frequency = 122.950 MHz.

South of 53° North, but with blocks K18, L16 and L17 included.

Primary frequency = 122.950 MHz.
Secondary frequency = 123.450 MHz.

HF:

a) 5645 kHz. Mainly for day time use.
b) 3453 kHz. Mainly for night time use.

MARIPHONE FM. VHF.

a) Channel 6. Simplex 156.30 MHz.
b) Channel 9. Simplex 156.45 MHz.
c) Channel 12. Simplex 156.60 MHz.
d) Channel 16. Simplex 156.80 MHz.

Note.
The frequencies used in the other operational areas of the North Sea are available from the helicopter operator.

Helicopter call signs.

The helicopter call sign will be the phonetic pronunciation of the registration letters of the helicopter, or a specific company call sign.

Once communication has been established the registration may be abbreviated to:

eg.
PH-NZA = PZA
G-AWHZ = GHZ

If your station is called but you are uncertain as to the identity of the station calling, transmit the following:

"Station calling (Platform name) say again your call sign."

Message content.

All messages must be short and to the point. Consisting off a contact call, the message and the close.

Time.

Times used should be in UTC (Universal Time Coordinated) but in some areas of the North Sea local time is used, but always using the 24 hour clock. Midnight shall be 24.00 hours. Unless confusion is likely to result, only the minutes need to be transmitted.

Example:

09.20. = time too ze-ro or ze-ro nin-er too ze-ro

Note.
When a helicopter gives a position report with no time, stated then assume actual time.

Corrections and repetitions.

When an error has been made in a transmission, the word "**correction**" must be used, followed by the correct version commencing with the last correct word or phrase.
If you are in doubt as to the correctness of a message always ask for a repetition in part or in full.
If the repetition of an entire message is required the words "**say again**" should be used.

If the repetition of a part of a message is required, say :

"Say again all before" (The first word satisfactorily received)
Or "say again all after". (Last word received)

Specific items should be requested as appropriate, such as:

"Say again eta". Or "say again altitude".

Note.

Radio communication between the offshore station and the helicopter during and just prior to the landing, and during and just after take off should be avoided.

Departure message.

If the next destination of the helicopter is an onshore airfield, the installation Radio Operator may be requested to pass a "departure message" to that airfield. Giving the following information:

A. Helicopter call sign.
B. Destination and estimated time of arrival (ETA).
C. Persons on board (POB).
D. Amount of cargo.

Under certain conditions the helicopter pilot may request a "radio watch" until radio contact has been made with the Flight information region (FIR) or an other offshore station.

Distress and urgency communications.

(MAYDAY)
Distress and urgency traffic must receive absolute priority over all other transmissions. A distress message should first be passed on the frequency in use. All stations that hear the distress message must immediately cease all other transmissions that are likely to interfere with the distress traffic. Always acknowledge a distress message, and try to collect as much information as possible including:

A. Aircraft call sign or name of ship.
B. Nature of the distress.
C. Present position.
D. Height (aircraft)
E. Heading.
F. Speed.
G. Number of persons on board. (POB)
H. Captains intentions.
I. Any other information that may help in the rescue.

All subsequent messages concerning the distress should be preceded by the word MAYDAY. The station that takes control of the Mayday should impose silence on all other stations using that frequency (or the distress frequency) by making the following transmission:

”All stations this is (platform name) stop transmitting mayday in progress, out.”

If and when the Mayday is over the "radio silence" should be cancelled by:

“All stations this is (platform name) distress traffic ended, out.”

Weather information.

The Operations Department of the Helicopter Company operating to your platform will require a "daily weather report", and when the helicopter is approaching your platform the pilot will request a "weather up-date" for specific items of the weather conditions.

The daily weather report:

A. Name of installation, rig or vessel.
B. Time of observation.
C. Wind direction.
D. Wind speed.
E. Visibility in nautical miles.
F. Cloud base
G. Temperature
H. Barometric pressure (QFE or QNH)
I. Other information such as thunderstorms, snow showers or haze etc.

Weather up-date.

A. Wind direction.
B. Wind speed.
C. Any other last minute changes.

Special note.

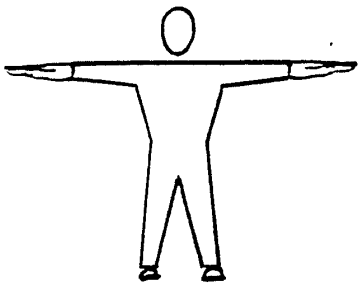
If calibrated equipment for cloud base and visibility is not available, always precede the distance with the words "estimated at"

A method of checking the visibility is via the radar equipment of the stand-by boat or supply boat if it is in the vicinity.

Hand marshalling signals.

Hover.

Arms extended horizontally at shoulder height with open hands and with the palms downwards.

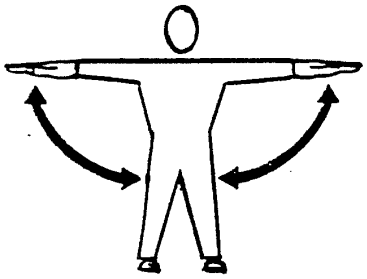


Land.

The arms extended downwards and crossed in front of the body.

Move vertically downwards.

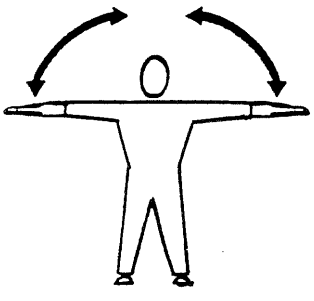
Move the arms downwards and upwards from the "hover" signal, with the palms downwards.



Move vertically upwards.

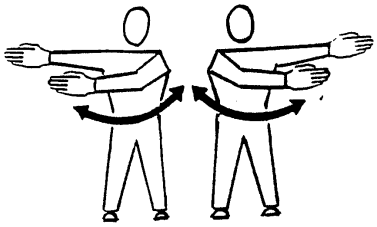
Move arms upwards and downwards from the "hover" signal, with the palms upwards.

NOTE. This signal must also be used for "GO UP" DO NOT LAND



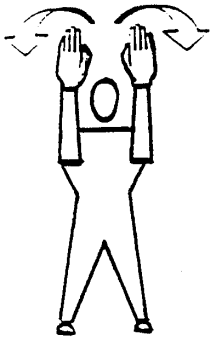
Move sideways.

Point with one arm in the direction of movement, move the other arm across the body backwards and forwards, until the required position is reached.



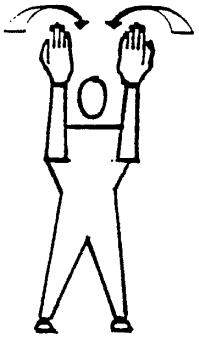
Move backwards.

Arms extended upwards with the palms forward, move the forward and backwards until the required position is reached.



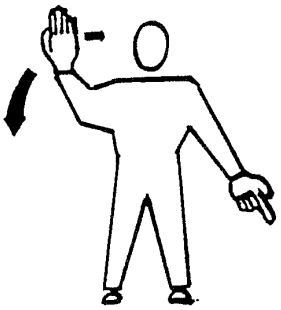
Move forwards.

Arms extended upwards with the palms backwards, move the arms forward and backwards until the required position is reached.



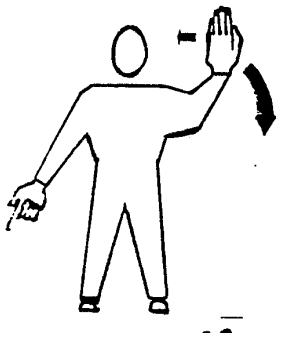
Turn to the right (clockwise).

Point with the left hand and wave the helicopter round with the right hand.



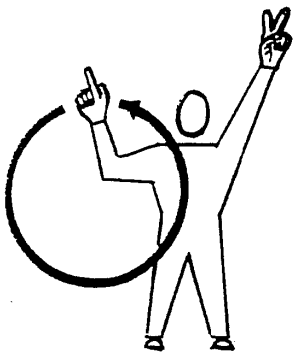
Turn to the left. (anti clockwise)

Point with the right hand and wave the helicopter round with the left hand.



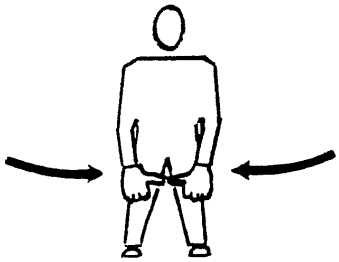
Start engine.

Left hand pointing upwards showing one or two fingers and make a circular motion with the right hand in front of the body. Engine No 1 is for the pilot the left hand engine.



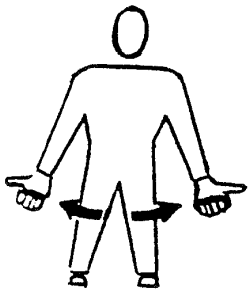
Insert wheel chocks.

Arms extended downwards with the fingers closed and thumbs pointing inwards. Move arms sideways in and out.



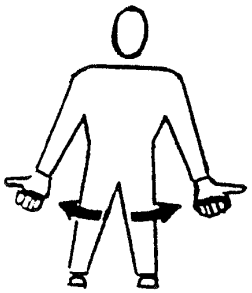
Remove wheel chocks.

Arms extended downwards with the fingers closed and thumbs pointing outwards. Move arms sideways in and out.



Pilots signal wheel chocks.

The pilot will give the instruction in the same way as above, but with his or her hands in front of the face.

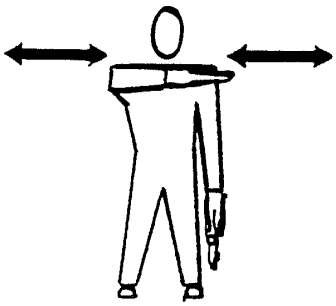


Start main rotor.

With the left arm pointing upwards. Make a circular motion with the right hand above the head.

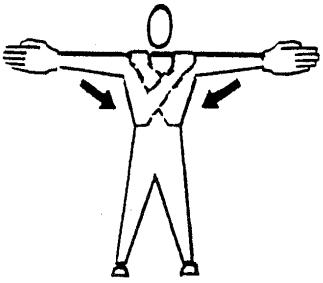
Stop engines.

Make a cutting motion with the right hand across the throat.



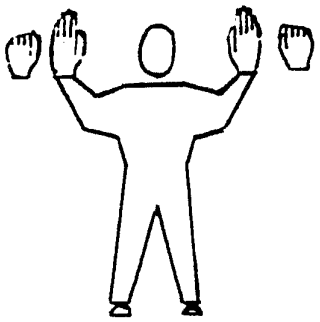
Stop rotors.

Start with the arms stretched outwards, move both arms in to clasp the chest and shoulders.



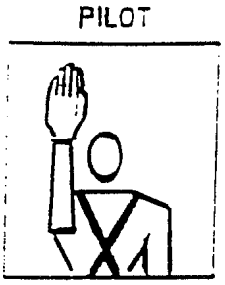
Engine fire.

Point to the engine on fire and then with both arms pointing upwards make rapid clenching and unclenching of the fists.
If the pilot requires action from the deck crew he or she will repeat the action with one hand.



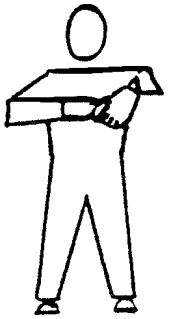
Engine fire no action from deck crew.

The pilot will make the signal with one hand.



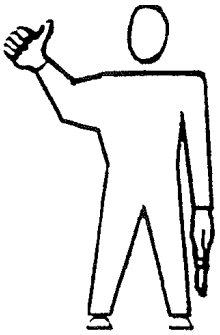
Remove external power.

With two fingers of the right hand clenched in the fist of the left hand. Make a pulling motion, removing the fingers from the fist. The pilot will give the instruction in the same way. With his or her hands in front of the face.

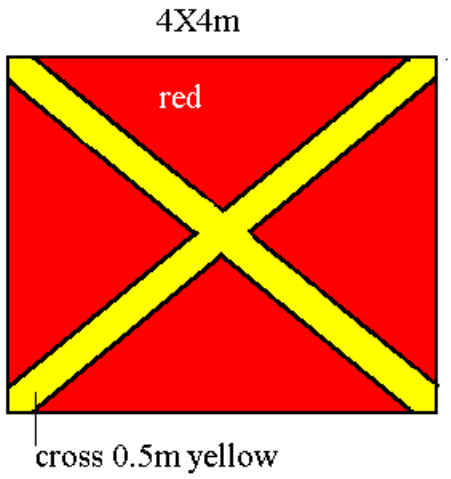


Helideck clear for take-off.

Hand or hands extended with the thumb or thumbs pointing upwards.



Warning:
When marshalling, always stay outside the rotor circle at all times.



Landing on installation or vessel prohibited.

For certain operational or technical reasons an installation may have to prohibit helicopter operations. In such circumstances, where the helideck cannot be used the "closed" state of the helideck will be indicated by use of the signal shown below. This signal is the standard "landing prohibited" signal given in the Rules of the Air and Traffic Control Regulations, except that it has been altered in size to just cover the letter "H" inside the aiming circles.

Chapter 6

Helicopter Loading

THE HELICOPTER LANDING OFFICER IS RESPONSIBLE FOR ALL THOSE ENGAGED IN OPERATIONS ON OR NEAR THE HELICOPTER LANDING AREA, INCLUDING THOSE ENGAGED IN LOADING AND UNLOADING DUTIES.

Loading duties.

Correct loading of the helicopter is the responsibility of the helicopter crew. Loaders may be detailed to give assistance. Those engaged in loading operations are required to be under the direct control of the Helicopter Landing Officer.

The Helicopter Landing Officer is responsible for the following operations:

A. Control the movement of all personnel on or near the helideck, Including disembarking and embarking passengers.

B. Control of all personnel engaged in the loading and unloading duties, following the instruction of a member of the helicopter crew.

C. On Helicopters not carrying a Flight Attendant, the Helicopter Landing Officer will have control of the passengers donning survival suits and after boarding the helicopter, the correct way of wearing the life jacket and before closing the doors that all the seat belts are secured.

D. Providing the helicopter crew with the correct manifest.

Passenger documents in general.

Each passenger should carry a valid passport, as flights to and from the continental shelf are considered to be "international flights" and the particulars on the manifest must be identical to that in the passengers passport. Further each passenger is issued with a ticket.

NOTE.
In the case of any uncertainty, with regards to the identity and the safety of any person or materials to be carried, the captain of the helicopter is authorized to refuse any passenger or material and may in some cases postpone or cancel the flight. it is needless to say that such action if necessary, will be co-ordinated with the company concerned.

Baggage.

Due to the limited payload and baggage capacity available in most types of Helicopters, it is advisable to reduce personal baggage as much as possible, both in weight and volume.
Individual companies can and do set limits for personal baggage with the obligation to report in advance if this limit is likely to be exceeded.
Always insure that the "correct" baggage label is attached to the baggage. Old labels must be removed. The Helicopter Landing Officer and his or her HDA'S should check that baggage and cargo are correctly labelled before being loaded into the helicopter.

Warning:

Baggage may not be carried in the cabin of the helicopter. Loose baggage could cause injuries to passengers and crew during a forced landing or hinder evacuation after a ditching.

Weight of passengers, baggage and cargo.

To insure that the available payload is efficiently used and the maximum "take off weight" of the helicopter is not exceeded. In accordance with Helicopteroperators a "Standard passenger weight" may be used but baggage and cargo must be weighed.

Check:

Always check with the helicopter operator for weight limitations.

If due to weather or other problems with the available weight that the helicopter can carry, it is advisable to weigh the passengers as well as the baggage.

Warning:

It is unacceptable to estimate the weight of baggage or cargo. Baggage and cargo must be weighed on every occasion prior to being transported by air.

When mail and or cargo is transported to other platforms (inter field) it is advisable to inform the Helicopter Landing Officer of the destination platform that mail or cargo is on board the helicopter.

Cargo handling.

All cargo is normally loaded into the baggage compartment of the helicopter. However in some cases large or long items will be transported in the cabin of the helicopter. Items that exceed the size or weight limitations of the baggage compartment will be stowed in the centre of the cabin, this is required to insure that the "weight and balance" of the helicopter will remain within the limitations.

Note:

Floor loading limitations for specific helicopters can be found in chapter 9 of this publication.

Special care must be taken when loading baggage and cargo to insure that the helicopter is not damaged in any way. When loading cargo in the cabin area there will be restrictions to the number of passengers, it is not permitted to carry passengers in front of, or next to the loaded cargo.

Note.
When sending cargo that exceeds the baggage area limitations always check with the operator as to the number of passengers that may be carried.

Warning.

When loading long items of cargo always carry it in the horizontal position. Two persons must carry items that are longer than 2 meters. When expecting heavy or large items, discuss the possibility of a shut-down prior to departure.

Dangerous goods.

It is only permitted to carry items that are classified as dangerous goods when they are accompanied by a "shippers declaration of dangerous goods". When the dangerous goods arrive at your installation special care must be taken to insure that all items are accounted for. Any discrepancies must be reported to the helicopter operator and the Installation Manager as soon as possible.

Dangerous goods are always be transported in approved packaging. It is advisable to retain the packaging in the event that the items have to be returned.

Note.
When sending dangerous goods by air, always employ the services of a company specialized in such work.

Passenger manifest.

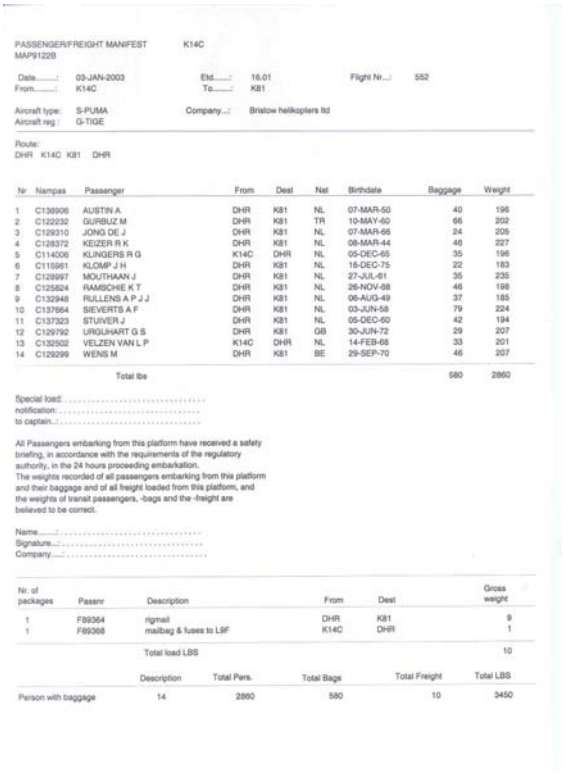
The entries to be made on the passenger manifest:

Example:

1.	=	Date.	September 15. 1992.
2.	=	Estimated time of departure.	16.00.
3.	=	Helicopter registration.	PH-NZM.
4.	=	Type of helicopter.	S76.B.
5.	=	Flight number.	22.
6.	=	Chartered to.	Name company.
7.	=	From.	Name or number of installation or vessel.
8.	=	To.	Name of destination.
9.	=	Names of the passengers.	----------
10.	=	Weight of the passengers.	----------lbs.
11.	=	Weight of the baggage. **	----------lbs.
12.	=	Passengers date of birth.	1-4-55.
13.	=	Nationality of the passenger.	Ned.
14.	=	Total weight of passengers and baggage.	----------lbs.
15.	=	Signature of the dispatcher.	----------

** This must be the actual weight of the baggage.

Note.
Always give the correct weight of baggage and cargo.



PASSENGER/FREIGHT MANIFEST K14C
MAP9122B

Date.....: 03-JAN-2003 Etd.....: 16.01 Flight Nr...: 552
From.....: K14C To.....: K81

Aircraft type: S-PUMA Company...: Bristow helikopters ltd
Aircraft reg.: G-TIGE

Route:
DHR K14C K81 DHR

Nr	Nampas	Passenger	From	Dest	Nat	Birthdate	Baggage	Weight
1	C138906	AUSTIN A	DHR	K81	NL	07-MAR-50	40	196
2	C122232	GURBUZ M	DHR	K81	TR	10-MAY-60	66	202
3	C129310	JONG DE J	DHR	K81	NL	07-MAR-66	24	205
4	C128372	KEIZER R K	DHR	K81	NL	08-MAR-44	46	227
5	C114006	KLINGERS R G	K14C	DHR	NL	05-DEC-65	35	196
6	C115961	KLOMP J H	DHR	K81	NL	16-DEC-75	22	183
7	C128997	MOUTHAAN J	DHR	K81	NL	27-JUL-61	35	235
8	C125824	RAMSCHIE K T	DHR	K81	NL	26-NOV-68	46	198
9	C132948	RULLENS A P J J	DHR	K81	NL	06-AUG-49	37	185
10	C137664	SIEVERTS A F	DHR	K81	NL	03-JUN-58	79	224
11	C137323	STUIVER J	DHR	K81	NL	05-DEC-60	42	194
12	C129792	URQUHART G S	DHR	K81	GB	30-JUN-72	29	207
13	C132502	VELZEN VAN L P	K14C	DHR	NL	14-FEB-68	33	201
14	C129299	WENS M	DHR	K81	BE	29-SEP-70	46	207
		Total lbs					580	2860

Special load: .....
notification: .....
to captain.: .....

All Passengers embarking from this platform have received a safety briefing, in accordance with the requirements of the regulatory authority, in the 24 hours proceeding embarkation.
The weights recorded of all passengers embarking from this platform and their baggage and of all freight loaded from this platform, and the weights of transit passengers, -bags and the -freight are believed to be correct.

Name.....: .....
Signature.....: .....
Company.....: .....

Nr. of packages	Passnr	Description	From	Dest	Gross weight
1	F89364	rigmail	DHR	K81	9
1	F89368	mailbag & fuses to L9F	K14C	DHR	1
		Total load LBS			10

	Description	Total Pers.	Total Bags	Total Freight	Total LBS
Person with baggage	14	2860	580	10	3450

Passenger manifest, number of copies required.

Depending on the destination of the passengers the following number of manifests will be required. Use a different manifest set for each destination.

A. For passengers with an on shore destination 3 copies will be required:
One copy is to be kept on the installation or vessel. The copy must be retained for a period of at least 24 hours.
One copy for the company that chartered the helicopter.
One copy for the helicopter operator. This copy will be used by the crew for calculation purposes.

B. For passengers with a destination another installation or vessel 4 copies are required:
One copy is to be kept on the installation or vessel. The copy must be retained for a period of at least 24 hours.
One copy for the company that chartered the helicopter.
Two copies for the helicopter crew. One of which will be handed to the Helicopter Landing Officer at the destination, and one for the helicopter operator.

It is permitted to use a manifest produced via a computer at your installation. But it is of great importance that all of the information found on an official manifest is also found
on the computerized version.

Incoming passenger manifest.

The Helicopter Landing Officer must always check the incoming manifest, to insure that the correct number of passengers have in fact disembarked from the helicopter. Any discrepancy must be reported to the pilot of the helicopter and to the Installation Manager or Captain.

Cargo or freight manifest.

Note.
If cargo is to be transported in a helicopter a cargo manifest is always required.

If mail is to be transported, it is advisable to enter this on a cargo manifest. This will act as a reminder to the crew of the helicopter.

Depending on the destination of the cargo the following number of manifests will be required. Use a different manifest for each destination.

A. For cargo with an on shore destination, 5 copies will be required:
One copy to be kept and filed on the installation or vessel.
One copy for the company that chartered the helicopter.
Three copies to be sent with the helicopter to the operations department.

B. Two of the copies are for the customs authorities at the airfield For cargo with as a destination another installation or vessel, 3 copies will be required:

C. One copy to be kept and filed on the installation or vessel.
One copy for the helicopter crew, to be used for calculation purposes.
This copy will be handed to the Helicopter Landing Officer at the destination.
One copy for the company that chartered the helicopter.

It is permitted to use a manifest produced via a computer at your installation. But it is of great importance that all of the information found on an official manifest is also found
on the computerized version.

Incoming cargo manifest.

The Helicopter Landing Officer must always check the incoming manifest, to insure that the correct number of packages have in fact been removed from the helicopter. Any discrepancy must be reported to the pilot of the helicopter and to the Installation Manager or Captain.
Cargo manifest.

The entries to be made on the cargo manifest:

EXAMPLE:

1.	=	Date.	September 15. 1992.
2.	=	Flight number.	22.
3.	=	Chartered to.	Name company.
4.	=	From.	Name or number of installation or vessel.
5.	=	To.	Name of destination.
6.	=	Helicopter registration.	PH-NZM.
7.	=	Type of helicopter.	S76.B.
8.	=	Number of packages.	----------
9.	=	Nature of goods.	Short description.
10.	=	Total weight of cargo.	----------lbs.
11.	=	Notification to Captain.	For special loads.

Note.
Always give the correct weight of cargo.

Warning.
Always take special care when loading cargo.

Conversion chart.

With this chart it is possible to convert pounds (lbs) to kilograms (kg) and kilograms to pounds.

kg.	⇦lbs./kg.⇨	lbs.	kg.	⇦ lbs./kg.⇨	lbs.
0.454	1.	2.205	23.133	51.	116.845.
1.814	4.	8.818	24.494	54.	119.049.
2.268	5.	11.023	24.947	55.	121.254.
2.722	6.	13.228	25.401	56.	123.459.
3.175	7.	15.432	25.855	57.	125.663.
3.629	8.	17.537	26.308	58.	127.868.
4.082	9.	19.846	26.762	59.	130.073.
4.536	10.	22.046	27.215	60.	132.277.
4.990	11.	24.251	27.669	61.	134.482.
5.443	12.	26.455	28.123	62.	136.686.
5.897	13.	28.660	28.576	63.	138.891.
6.350	14.	30.864	28.030	64.	141.096.
6.804	15.	33.069	29.483	65.	143.300.
7.257	16.	35.274	29.937	66.	145.505.
7.711	17.	37.497	30.391	67.	147.710.
8.165	18.	39.683	30.844	68.	149.683.
8.618	19.	41.888	31.298	69.	152.119.
9.072	20.	44.092	31.751	70.	154.323.
9.525	21.	46.297	32.205	71.	156.528.
9.979	22.	48.502	32.658	72.	158.733.
10.433	23.	50.702	33.112	73.	160.937.
10.886	24.	52.911	33.566	74.	163.142.
11.340	25.	55.116	34.019	75.	165.347.
11.793	26.	57.320	34.472	76.	167.551.
12.247	27.	59.252	34.926	77.	169.756.
12.701	28.	61.729	35.380	78.	171.960.
13.154	29.	63.934	35.834	79.	174.165.
13.608	30.	66.139	36.287	80.	176.370.
14.061	31.	68.343	36.741	81.	178.574.
14.515	32.	70.548	37.149	82.	180.779.
14.968	33.	72.752	37.648	83.	182.983.
15.422	34.	74.957	38.102	84.	185.188.
15.876	35.	77.162	38.555	85.	187.393.
16.329	36.	79.336	39.009	86.	189.597.
16.783	37.	81.571	39.462	87.	191.802.
17.236	38.	83.776	39.916	88.	194.007.
17.690	39.	85.980	40.370	89.	196.211.
18.144	40.	88.185	40.823	90.	198.416.
18.597	41.	90.389	41.277	91	200.620.
19.051	42.	92.594	41.370	92.	202.825.
19.504	43.	94.799	42.184	93.	205.030.
19.958	44.	97.003	42.638	94.	207.234.
20.412	45.	99.207	43.091	95.	209.439.
20.865	46.	101.413	43.545	96.	211.644.
21.319	47.	103.617	43.998	97.	213.848.
21.772	48.	105.822	44.452	98.	216.053.
22.226	49.	108.257	44.905	99.	218.257.
22.682	50.	110.231	45.359	100	220.462.

Chapter 7

Transportation of special Loads

Transportation of special loads.

"Special load" is the collective term for those items of cargo which, due to there nature or value will require special treatment by all personnel during the stages of acceptance, storage, stowage and transportation.

Under the heading of "special load" will fall:

- Dangerous goods.
- Live animals.
- Strongly smelling cargo.
- Human remains.
- Perishable cargo. (including foodstuffs)
- Valuable cargo.
- Wet cargo.
- Living human organs and blood shipments.
- Spare parts for aircraft that are "AOG" coded.
- Undeveloped film.

All of the above items with the exception of "Valuable cargo" must be entered in the part of the cargo manifest designated "Special load notification to Captain" (NOTOC)
Either the operations department of the helicopter operator or the approved dispatcher on an offshore installation or vessel issues this.
The Helicopter Landing Officer should have good background knowledge of the above requirements including the transport of dangerous goods.

Dangerous goods.

Definition of dangerous goods

Dangerous goods comprise of all articles or substances which are capable of posing a significant risk to health, safety or property when transported, and which are classified according to I.C.A.O. Annex 18 and the Technical instructions for the safe transport of dangerous goods by air.
For the purpose of transportation dangerous goods have been divided into three (3) categories. They are:

1. Forbidden:
   Those, which are forbidden for transportation by air
2. Acceptable:
   Those items, which are acceptable for air transport, provided all the special provisions concerning packaging; quantity and compatibility are complied with.
3. Excepted:
   Known items in general use such as, after shave lotions, perfumes and alcohol etc. this being directed at passengers and their baggage.

Also included in the list of items carried with "operator dispensation" are alcoholic beverages, perfume and colognes, which are on some specific flights carried by helicopter operators for sale during the flight.

Classification of dangerous goods

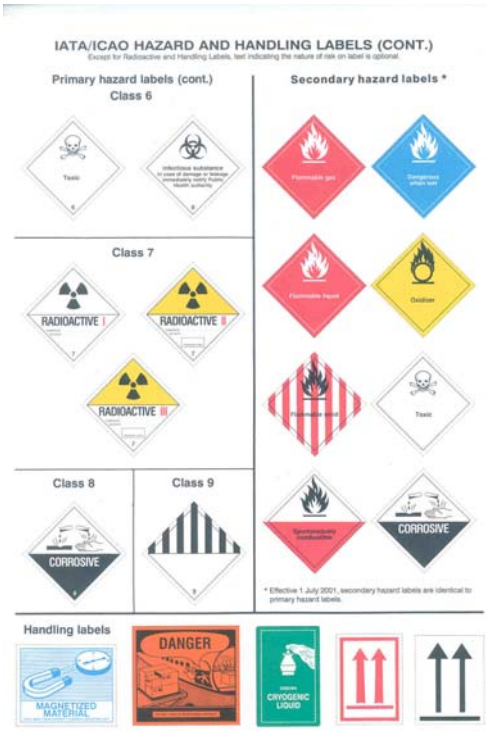
Class 1.	Explosives.
Class 2.	Gases. (Compressed, liquefied, dissolved under pressure or deeply refrigerated)
Class 3.	Flammable liquids.
Class 4.	Flammable solids. (4,1) Substances liable to spontaneous combustion (4,2) Dangerous when wet, will emit flammable gases. (4,3)
Class 5.	Oxidizing substances. (5,1) Organic peroxides.(5,2)
Class 6.	Poisonous toxic substances (6,1) Infectious substances (6,2)
Class 7.	Radioactive materials.
Class 8.	Corrosives.
Class 9.	Miscellaneous dangerous goods

Three letter dangerous goods code.

With the handling of dangerous goods, constant reference will be made to the IATA Cargo
International Message Procedure (IMP) codes

The codes and there meaning are listed as follows:

RX	Explosive. (3 rd letter will show the compatibility group)
RNG	Non-flammable gas
RFG	Flammable compressed gas.
RPG	Poisonous gas (toxic)
RCL	Cryogenic liquids (deeply refrigerated gas)
RFL	Flammable liquid
RFS	Flammable solid
RSC	Spontaneously combustible substances
RFW	Dangerous when wet
ROX	Oxidizing substances.
ROP	Organic peroxide
RPB	Poisonous substances. (In packing group I and II)
RHF	Harmful substances. (Always stow away from food)
RSB	Polystyrene beads. (Self-expanding)
RIS	Infectious substances
RRW	Radioactive. (White label I)
RRY	Radioactive. (Yellow label II and III)
RCM	Corrosive materials.
MAG	Magnetised materials.
ICE	Dry ice.
CAO	Cargo aircraft only
RMD	Miscellaneous dangerous goods



Marking and labelling

All packages containing dangerous goods must have the correct marking and labelling, as laid down in the IATA Dangerous goods regulations. In all cases the "Proper shipping name" the "UN" or "ID Number" and quantity must be noted on the outer packing together with the correct "Hazard labels".

Further to this a "Shippers declaration of dangerous goods" is required.

Note.
Always use the IATA dangerous goods regulations as reference.

Class identification.

Class 1. Explosives.
(RX-) e.g. 1.4 = RXC. 1.4S = RXS.

This class comprises of 5 divisions. Only explosives in division 1.4 and specific items in class 1.3 are acceptable for carriage by air.
Explosives are also given a compatibility code, which will be written on the label after the division code. e.g. 1.4S or 1.4D.

Only explosives identified as 1.4S may be carried on passenger aircraft

Other compatibility groups of explosives are "Cargo aircraft only" (CAO) and will always carry a hazard label with its class division and compatibility group written in the bottom corner of the label.

Code RX-+ compatibility group B, C, D, E and G packages bearing this label are for "Cargo aircraft only". These packages may only be stowed with other class 1 RX of the same compatibility.
Explosives in groups C, D, and E may be stowed together.
Packages bearing the 1.4 label must not be stowed
Adjacent to:
Class 2. RNG, RCL or RFG.
Class 3. RFL.
Class 4. RSC and RFW
Class 5. ROX and ROP.
Class 8. RCM.

Code RXS.
Packages classed as 1.4S are suitable for carriage on passenger aircraft, but must not be stowed adjacent to:
Class 8. RCM.

Class 2 compressed gases.
(RNG, RFG, RCL, RNG)

This class has no divisions and comprises of:

A. Permanent gases, gases that cannot be liquefied at ambient temperatures.
B. Liquefied gases, gases that can become liquid under pressure at ambient temperatures.
C. Dissolved gases, gases dissolved in a porous substance.
D. Deeply refrigerated gases. Liquid air, oxygen etc.

Gases are either termed flammable or non-flammable.

Code RNG. (Non-flammable)

Code RCL. (Deeply refrigerated)

Class 2. Must not be stowed adjacent to
Class 1. Explosives other than 1.4S (RXS)

Code RFG. (Flammable gas)

Class 3 flammable liquid.
(RFL)

This class has no divisions.

Class 3 comprises of liquids or mixtures of liquids, which give off flammable vapours at specific temperatures.

Remember that the flash point of flammable liquid is the temperature at which the liquid will give off a vapour, which can be ignited by a flame or spark.

Note.
Do not leave class 3 substances exposed in direct sunlight or extreme temperatures.

Code RFL.
Packages coded RFL must not be stowed adjacent to:
Class 1 explosives other than 1.4S (RXS)
Class 5 ROX and ROP.

Class 4. Flammable solids.
(RFS, RSC, RFW)

This class has 3 divisions:

Division 4.1. Flammable solids (RFS)
Division 4.2. Spontaneously combustible substances (RSC).
Division 4.3. Water reactive (Dangerous when wet) (RFW).

Code RFS (Flammable solid)

Code RSC (Spontaneously combustible)

Code RFW (Flammable when wet)

Class 5. Oxidizing materials and organic peroxides.
(ROX, ROP)

This class has 2 divisions.

Division 5.1. Oxidizing material (ROX)
Division 5.2. Organic peroxides (ROP)

Note.
Organic peroxides that are marked with an "i" can cause serious damage to the eyes if allowed to come in contact with them.

Code ROX (Oxidizing material)

Packages coded ROX or ROP must not be stowed adjacent to:
Class 1. Explosives other than 1.4S (RXS).
Class 3. (RFL).
Class 4. (RCS and RFW).
Class 8. (RCM).

Code ROP (Organic peroxide)

Class 6. Poisonous and infectious substances
(RPB, RHF, RIS)

This class has 2 divisions.

Division 6.1. Poisonous substances (RPB) packing group I and II.
Harmful substances (RHF) packing group III.
Division 6.2. Infectious substances (RIS).

Code RPB (Poisons)

Code RHF (Harmful)

Packages coded RPB, RHF or RIS must not be stowed in the same compartment as foodstuffs or catering equipment.

Note.
The lower part of the label should bear the inscription:

HARMFUL.
Stow away from foodstuffs.

Code RIS (Infectious)

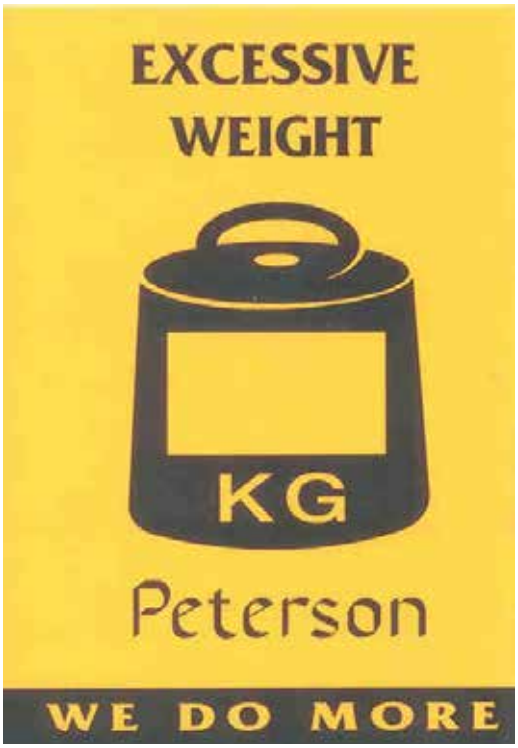
Note.
The lower part of the label should bear the inscription.

INFECTIOUS SUBSTANCES.
In case of damage or leakage, immediately notify
Public Health Authorities

Class 7. Radioactive material.
(RRW, RRY)

This class has no divisions.

There are 3 different labels used for this material and the label used will depend on the amount of "Activity" in each package.



Code RRW.

Packages coded RRW can be treated for loading purposes as general cargo, but must never be stowed on the flight deck or in the cabin of passenger aircraft.

Code RRY.

The loading limitations for RRY are based on the number of "Transport indices" (TI) permitted in each aircraft compartment.
The TI is written on the label of each package and must be added together when massed together for transport purposes. Label II is used for a maximum of 1.0. TI. Label III is used for up to a maximum of 10. TI.'s

Class 8. Corrosive material.
(RCM)

This class has no divisions.

Most substances in this class will cause damage to the skin, eyes and clothing if allowed to come into contact with them.

Code RCM (Corrosive material)

Packages coded RCM must not be stowed adjacent to:
Class 1. RX- (All comparability groups)
Class 4. RSX and RFW.
Class 5. ROX and ROP.

Class 9. Miscellaneous dangerous goods.
(RMD)

This class has no divisions.

It consists of substances whose properties do not match any of the other 8 classes, but still pose a risk to safety unless properly prepared for carriage.

Code RMD.

Code MAG (Magnetized materials)

When stowing a quantity of similar magnetic cargo, the individual packages are to be stacked in a random fashion (i.e. front to rear, top to bottom) so that the magnetic fields of each piece will tend to cancel one another out.

Special note.
It is of great importance that the aircraft Compass systems are not affected.

Code ICE (Dry ice)
(No label).

Do not stow ICE in the same hold as live animals.
Do not stow ICE in the same hold as hatching eggs.

Dry ice has a surface temperature of -78°C (-109°F) severe burns may result if protective gloves are not used. Always ventilate the hold before entering to unload. There is always the danger of asphyxiation.
Code RSB. Polystyrene beads

Polystyrene beads are a semi processed expandable product used to manufacture polystyrene articles. When they are impregnated with flammable gas or liquid as a blowing agent, they may release small quantities of flammable gas during transportation. A total of not more than 100 kg may be carried in any compartment of any aircraft.

Orientation labels.

In addition to the previous mentioned labels, special attention must be paid to the following:

This way up.

Colour: Red or Black on a contrasting background.

Packages bearing these labels must be stowed accordingly. Single packages with end closures, containing liquids must be stowed with the closures upwards.

Cargo aircraft only

Cargo bearing this label must not be loaded on aircraft carrying passengers.

Extra hazard labels.

Packages containing dangerous goods may have more than one label attached to the outer packing. This is due to the fact, that some substances have more than one hazard. (See example 1.) Or that the package contains a number of substances with different hazards (see example 2.)

Comparability.

Packages containing substances, which may react dangerously with each other, must not under any conditions be stowed next to each other in the aircraft or in a position that could allow interaction, thus, all incompatible dangerous goods must be segregated. To this end the "mixed load restrictions" must at all times be taken into account.

Note.
For mixed load instructions see I.A.T.A. manual of dangerous goods

Packing.

Dangerous goods must be packed in containers that are approved according to the packing instructions as laid down in the I.A.T.A. Dangerous goods regulations. For this purpose the regulations divide the dangerous goods into three groups, depending on the degree of danger that they may present.

Packing group I	=	Great danger.
Packing group II	=	Medium danger.
Packing group III	=	Minor danger.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS

Special Cargo Services BV - Bregguttlaan 7, 1438 BA Oude Meer / Schiphol, The Netherlands
For: Peterson Den Helder BV
Helihaven
Den Helder, The Netherlands

Air Waybill No.

Page 1 of 1 Pages

Shipper's Reference Number (optional): 0111259

Consignee
NAM Platform
L13 FC-1
, Netherlands Continental Shelf

SPECIAL CARGO SERVICES

IATA

Two completed and signed copies of this Declaration must be handed to the operator

TRANSPORT DETAILS

This shipment is within the limitations prescribed for: (delete non-applicable)
PASSENGER AND CARGO AIRCRAFT

Airport of Departure: DEN HELDER

Airport of Destination:

WARNING

Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. This Declaration must not, in any circumstances, be completed and/or signed by a consolidator, a forwarder or an IATA cargo agent.

Shipment type: (delete non-applicable)
NON-RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS (See sub-Section 8.1 of IATA Dangerous Goods Regulations)

Dangerous Goods Identification							
Proper Shipping Name	Class or Division	UN or ID No.	Packing Group	Subsid risk	Quantity and type of packing	Packing Inst.	Authorization
ISOPROPANOL	3	UN 1219	II		1 fibreboard box x 1 L net	305	

Additional handling information

Emergency response telephone number: (USA 011) +31-20-655 6262

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name/Title of Signatory
Ivo Jongh Visscher, D.G. Expert
Place and Date
Oude Meer / Schiphol, 26-11-2005
Signature (see warning above)

Specific packing instructions

Specific packing instructions and net quantities, in relation to the "proper shipping name" and the "UN" or "ID number" are to be found in the I.A.T.A. Dangerous goods regulations. Special attention must be paid to the issue date of the publication.

Always use the current edition of the regulations.

The approved list of items.

Some helicopter operators may be restricted to carrying specific items of dangerous goods that have been approved by the Civil Aviation Authorities of that country. This list of items is known as "The approved list of items". Other operators follow the regulations as laid down in I.A.T.A. Regulations.

Bilateral agreement.

This agreement made between the Civil Aviation Authority of the Netherlands (RLD) and the United Kingdom (CAA).
Except when otherwise provided for in the "technical instructions", no person may offer, or accept dangerous goods of any class for transportation by air, unless those goods are properly classified, documented, certificated, described, packed, marked, labelled and in the correct condition for shipment as required by the technical instructions.

When all of the required precautions have been taken, transportation by air of items, which possess potentially hazardous characteristics, may be carried out in a safe and acceptable manner.

The above mentioned legislation together with the "state" and "operator" variations are incorporated in the I.A.T.A. Dangerous goods regulations.(DGR).
This implies that violation of the instructions as covered by the I.A.T.A. DGR may not only
lead to disciplinary measures to the operator, but may also result in legal action both national and international.

Loading of dangerous goods.

Dangerous goods that are to be carried on board helicopters will be stowed in the cabin area only. Special care must be taken to insure that the dangerous goods are secured in the correct position and manner.

Damaged or missing labels.

All damaged or missing labels must be replaced immediately.

Note.
All dangerous good must be accessible at all times during the flight. This will enable a crewmember to make regular checks on the condition of the load during the flight.

Loading of magnetic materials.

Great care must be taken to insure that magnetic materials are not loaded in a position where they will have any effect on the aircraft instruments. Although the strength of the magnetic field is limited by the regulations, special attention must be given to crosschecking all magnetic compass indications when magnetic materials are carried.

Inspection of the load.

All packages that are to be loaded into an aircraft must be inspected prior to loading for any signs of leakage or damage to the packing. After this inspection the "N O T O C " (notification to captain) can be completed and issued.
The operations personnel of the helicopter company or the dispatcher of the offshore installation or vessel carries out this task.

Note.
The above-mentioned personnel must be qualified for this work.

During off-loading from the aircraft the packages must again be inspected for any evidence of damage or leakage. This will include an inspection of the area where the package(s) was (were) stowed. The Flight Attendant will carry out this inspection.

Handling of incidents and accidents with dangerous goods.

For your own protection, and that of other personnel involved in the transportation of special loads, if confronted with a leaking or damaged packages containing dangerous goods.
The following procedures must be applied at all times.

Damaged packages.
(All classes except class 7.)

Warning.
Never load damaged packages.

When a package or packages containing dangerous goods are damaged but with no spillage, separate the package or packages and warn a member of the helicopter crew or the Helicopter Landing Officer.

Spillage of contents.
(Class 1 to 5 and 9.)

Warning.
Never load leaking packages.

In cases of spillage of the contents (liquids, solids, gases or fumes) if possible place the package or packages in a safe place preferably in open air, and inform a member of the helicopter crew or the Helicopter Landing Officer.

Contamination of skin or clothing.
(Classes 1 to 5 and 9.)

Remove contaminated clothing as soon as possible preferably under a running shower and have the clothing cleaned, wash the contaminated areas of the body for a period of at least 10 to 15 minutes. with running water. If so required contact a physician as soon as possible.

Spillage of contents.
(Classes 6 and 8.)

Never move a damaged package. Insure that contamination does not spread. Protect your person and inform the Helicopter Landing Officer.

Class 6.

In cases of contamination of clothing replace as soon as possible, if the contamination has penetrated to the skin wash in running water with soap for a period of at least 15 to 20 minutes. Insure that another person opens doors and operates taps etc. to prevent any further contamination.

Note.
If the skin is contaminated consult a physician as soon as possible.

Class 8.

In cases of contamination with this class immediately douse the affected person with large amounts of running water, then with great care remove the clothing and continue to douse the affected parts.

Note.
Use as much water as possible.
Do not rub the skin.
Consult a physician immediately.

Helicopter cargo-carrying facilities.

Helicopters are capable of carrying cargo in both the main cabin and in the baggage holds (compartment). Some helicopters have baggage/cargo hold at the rear of the cabin area, such compartments are usually small and are not fitted with liners, fire detection or extinguishing systems.

Note.
Cargo or baggage compartments that cannot be reached by a member of the crew during the flight may not be used for the transportation of dangerous goods.

Notification to captain (N O T O C)

The captain of the helicopter must be provided with written information (manifest) as soon as practically possible prior to the departure time, covering the "special load" that is to be carried. (See chapter 6 page 06/08.)

If dangerous goods are to be transported from an airfield to an offshore installation or vessel the goods will be accompanied by a "shippers declaration". If the goods are to be transported from an offshore installation or vessel, to an airfield or an other installation or vessel, all the required information must be relayed to the operations department of the helicopter operator well before the departure time of the helicopter, in order to have the information checked regarding the amount, type of packing and the correct labelling etc.

Note.
The captain of the helicopter is not permitted to accept dangerous goods of any nature if he or she has not received a manifest containing a "N O T O C" before the flight.

Chapter 8

Refuelling and fuel control

Introduction

All personnel who handle and dispense aviation fuel must understand that the safety of the helicopter and its passengers will depend on their ability to supply the correct grade of clean, dry, uncontaminated fuel to the helicopter. Flight safety will depend on the skill and knowledge of the personnel, and their carrying out this task correctly and efficiently at all times.
Aviation fuels, equipment and handling methods are continually being developed and improved to meet the ever-increasing demand of the modern helicopter. One thing will never change, that is the vital importance of always supplying the correct grade of uncontaminated fuel to the helicopter

This chapter will deal with:

- The characteristics of the fuel
- Quality control checks
- Components of the fuel system
- Refuelling procedures

Please note:

The information that is given in this handbook and training course. Regarding refuelling systems is based on general requirements. The equipment that is used on the installation or vessel where you are stationed may differ in some ways, but the basic information that will be given will be sufficient to enable you to operate your system safely and efficiently.

Jet A1 Aviation Fuel - Fuel Characteristics.

The grade of fuel that is normally used by helicopters operating to offshore installations and vessels in the North Sea is "JET A1". Jet A1 is a petroleum distillation blended from kerosene fractions and manufactured to closely defined specifications (D ENG.RD 2494)

The engine manufacturers and airlines in conjunction with military requirements lay down the specifi-cations. Rigid checks must be made at each stage of movement of the fuel from the refinery to the aircraft, to eliminate the possibility of contamination by water, dirt, sediment, bacterial growth, etc. The rigid sequence of equipment and fuel quality checks described in this handbook are for this purpose.

All tanks and refuelling system components must be correctly marked and labelled as to the type of fuel they contain. There are a number of other turbine fuels in existence, but for helicopter operations in the North Sea, Jet A1 is the type used.
Always ensure that only "on grade" JET A1 aviation fuel is delivered to the helicopter, and that the correct administration procedures are carried out at all times.

Fuel Characteristics Jet A1	
Flash Point	≥38 ºC
Self Ignition Temperature	200 ºC
Density	775-840 Kg/m^3
Freezing Point	-47 ºC Max.

Grade label

Fuel Additives.

Dye

Other fuels may have a dye added to them to help distinguish them from jet fuels.

Anti static additive

An "anti static additive" (ASA 3.) may be added to the Jet A1 fuel to assist the dissipation of static charges, which may build up in the fuel as it is pumped.

Anti Icing additive

In certain circumstances an "anti icing additive" may have to be added to the fuel. As an example, the Sikorsky S76 helicopter will require such an additive when the air temperature reaches 4 °C or lower. It must be added during refuelling.

Anti fungal additive

Contamination.
Contamination problems arise mainly from water, dirt and sediment. One other cause of contamination is bacterial growth. This will show itself where water is present.

Water.
Water in aviation fuels is a constant and troublesome cause of contamination. However, water in the fuel can be either dissolved or undissolved. Not all forms of water in the fuel can be considered to be contamination.

Dissolved Water

Because Jet A-1 is kerosene based fuel it is normal for water to be taken up as a solution, or absorbed, into the fuel at higher temperatures. In this form the water is said to be dissolved.

Water can enter the fuel system as moisture from the atmosphere when air enters the tank. Depending on the outside temperature, this moisture can condense inside the tank, or can be absorbed into the fuel

Dissolved water is a normal part of any kerosene based fuel and should not be considered a contaminant. However, as the fuel cools, any water dissolved in the fuel may come out of solution, and take on one of the other two forms.

Free Water
Undissolved water in the form of droplets on the side, or as bulk water, or "slugs", at the bottom of the fuel, is referred to as "free water". This type of water is relatively easy to see and eliminate from the fuel by draining. Free water in the fuel should be considered a contaminant.

Suspended Water
Undissolved water in the form of fine drops, finely dispersed through the fuel, is referred to as "suspended" water. In this form the water may appear as a haze or fog in the fuel. Because it is more difficult to detect and eliminate, suspended water represents the most serious form of water contamination in the fuel.

All traces of free water, or free water in suspension, must be removed by allowing the water to settle, and then by draining off that water, or by filtration via the water separator and / or the filter monitor.

Bacterial growth.

In the presence of undissolved water, a fungus (gladiosporum resinea) grows at the interface of the fuel and water, causing problems such as clogged filters and corrosion etc. To avoid this growth, the system must be drained daily to eliminate any water, which might be present.

Note:
If the refuelling system is fitted with a hand pump, it should be operated at least once each week for a short time to prevent the build up of the "fungus".

Dirt and sediment.

Dirt and sediment generally consist of small amounts of rust, sand, dust, scale, etc. They will appear as discoloration or deposits in the fuel. All traces of dirt and sediment must be removed to prevent any blockage within the small hose and pipe work, filters and fuel control valves of the helicopter fuel system. Failure to eliminate them could result in an engine failure.

Surfactants

Surface-active agents, or "surfactants", are substances, which affect the surface tension between 2 fluids. The most common examples would be soaps and detergents. They may have the effect of allowing water to emulsify in the fuel and remain in suspension. They may also reduce the ability of certain types of filter to do their job. Surfactants occur in nature, but many fuel additives also behave as surfactants. The HLO is not in a position to test for excessive amounts of surfactant, but must be alert for the effects of their presence.

Quality Control.

Careful control and good documentation must be maintained on all Jet A1 stocks at each stage of the movement from the refinery to the local storage, and by transportable tank to the offshore installation or vessel. Great care is taken to ensure good quality fuel is delivered to the off shore installation or vessel. Even with this high level of quality control, the fuel will still require special care at all times.

Visual Check

This check is a simple field test to confirm the acceptability of the fuel. The fuel is checked visually for appearance / colour, particulate contamination, and the presence of free water, and chemically for the presence of suspended water.
Samples for a visual check should be drawn into scrupulously clean, clear glass jars. The standard size is 1 Usgal. Normally the fuel should not completely fill the jar. The jar is then swirled to create a vortex. Any free water or sediment will tend to concentrate in the bottom of the vortex, making it easier to see.

Chemical Water Detection Kits.

Although water finding paper or paste has proved effective in detecting the presence of "free water", neither of these methods are of any use in detecting finely dispersed suspended water. Such dispersion can be formed by the passage of water and fuel through a pump or filter. Visual examination would normally detect such suspensions, but experience has shown that, with aviation turbine fuels, there can be borderline cases where the human eye cannot be relied upon.

In view of this unreliability, a number of detection kits have been developed. They include: Shell Water Detector, Velcon Hydrokit and Mobil Water Indicator. All of the detection kits are developed to give a positive colour change, indicating suspended water in the fuel, with a concentration down to 30 parts per million or below.

The Shell Water Detector is currently the most common system in the offshore industry. For this reason the description in this manual is limited to this type

The Shell Water Detection Kit.

Construction
The Shell water detection kit consists of a standard, unbreakable, 5 ml syringe, which is fitted to accept a plastic detector capsule in which contains a yellow, water sensitive paper.

Method Of Use.

- Fit the capsule to a closed syringe,
- Immerse the capsule and approximately half of the syringe into the fuel sample that is to be tested,
- Withdraw the plunger until the fuel in the syringe reaches the 5 ml mark.
- Any suspended water in the fuel will collect on the yellow paper, dissolving the dye, thus producing a distinctive color change. A test is said to be positive if there is an observable color change. The capsule should be strongly discolored with as little as 30 PPM of suspended water in the fuel.
- The portion of the yellow paper that is protected by the plastic moulding will remain unaffected, if there is suspended water in the fuel this will help in giving a clear color comparison.

One Time Use

A detector capsule may only be used once and should then be discarded into a container for disposal in the normal way. Care must be taken when working in rain or damp conditions. Keep the capsule dry at all times to avoid false indications. The capsule tube and box should be kept in a dry place until required for use.

Application.
The kit may be used to test all types of kerosene based aviation fuel for suspended water.

Storage Life.
The storage life of the capsules is not longer than 9 months from manufacture. The expiry date is stamped on the end of the box, and etched on the end of each tube in the box. This expiration date must be strictly observed. Do not use the capsules after the date marked on the tube.

Package.
Detector capsules are packed in a cardboard box, which contains 10 tubes, each tube contains 8 capsules.

Colour Blindness.
It is most important that persons suffering from colour blindness DO NOT conduct these tests.

Acceptable fuel

To be acceptable, jet A1 fuel must be:

- "Undyed": the acceptable color may vary from water clear to a light straw color. The presence of any other color may indicate contamination with other fuels, which are "dyed" to aid in identifying them.
- "Clear and bright": The phrase is independent of the natural color of the fuel. "Clear" refers to the absence of sediment or emulsion. "Bright" refers to the sparkling appearance of fuel having no cloudiness, fogginess or haze.
- Free of any particulate matter such as small amounts of rust, dust, scale or fungus
- Free from undissolved water.

Phrases used to describe this situation include:

- Undyed, clear and bright
- Clear, bright and uncontaminated
- Clear, bright and free of water

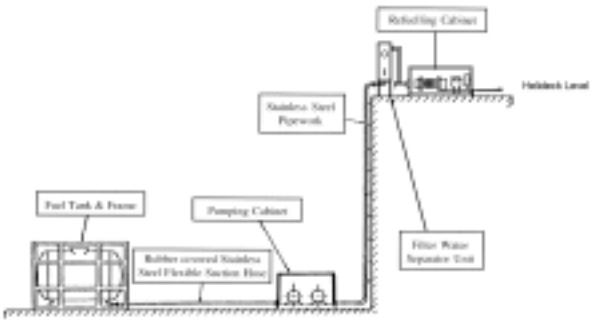
Action if found to be contaminated:

- If free water is present in the sample, continue to draw off further samples until all the free water has been drained off.
- If suspended water is found in the sample, allow a further settling time of 30 minutes per foot (30 cm) of fuel in the tank. At the end of this period re-sample and check if the fuel is still contaminated. Repeat the process once more. If the fuel is still contaminated seal off the tank and return it to the fuel supplier onshore.
- If dirt or sediment is present in the sample, draw off a further two samples. If these samples are still contaminated seal off the tank and return to the fuel supplier onshore.

Helicopter Refuelling System.

Typical Arrangement Of A Fuel Installation.

Figure illustrates a typical arrangement of a refuelling installation. This is used as a basis for describing the main features of each of the component parts.

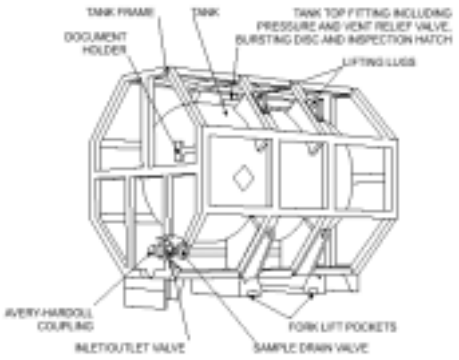


TYPICAL ARRANGEMENT OF FUELLING SYSTEM

Each refuelling installation as fitted to the different offshore installations and vessels will differ in some way or other, but the operation of the basic components will be the same.

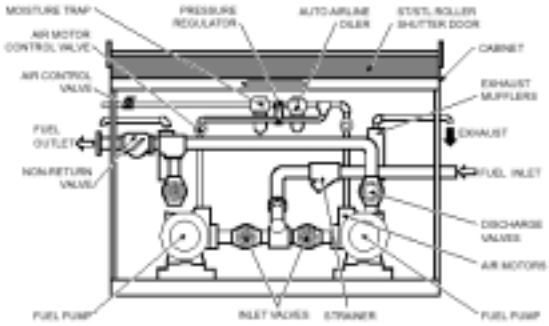
Note:
Get to know your own system and be able to name the parts and their function. This is of great importance in faultfinding and in arranging for repairs or spare parts when required.

Transportable Tank.



Each installation will have a number of transportable tanks available. There are a number of different types in use ranging from 1900 to 4560 or more litres capacity. They may be constructed of stainless steel or "epecote" lined mild steel. Figure shows the component parts of two different types of tank.

A release certificate indicating the quality and quantity of the fuel should accompany each delivery of aviation fuel, by transportable tank, from the supplying company to the offshore installation, or vessel



FRONT VIEW OF PUMPING UNIT

Construction Standards.

All tanks must conform to rigorous construction and safety standards to satisfy the requirements of the heli-copter operators, the suppliers of JET A1 fuel and the various regulatory authorities.
Each tank must be marked with an identification number and grade plate and should be clearly marked with the last inspection and cleaning dates.

Suction Hose
The suction hose from the tank to the pump is normally made of stainless steel covered by a rubber sheath for protection. The ends of the sheath should be clamped to prevent water build-up in the space between the sheath and the hose or the hose should be positioned in such a way that any water can drain out of this space.

Figure shows the fuel flow arrangement from the "transportable tank" via the "pumping cabinet" and "filtration units" to the "refuelling cabinet.
Note: All interconnecting pipe work must be of stainless steel.

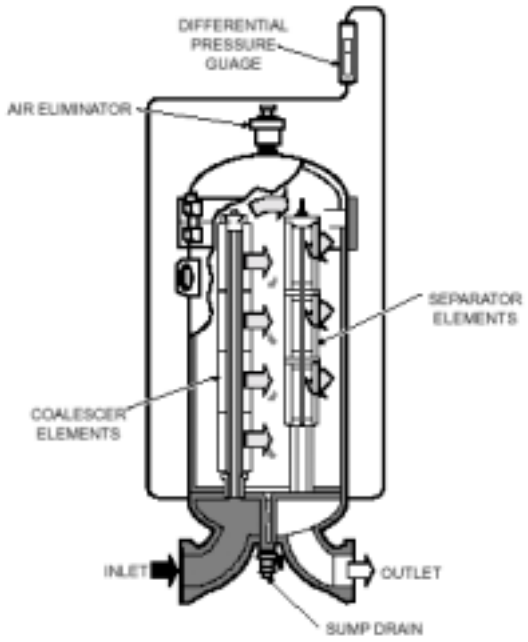
The Pump Unit.

A pump unit contains one, or more, pumps which may be driven by a compressed air motor or an electric motor. Figure shows a typical arrangement with the associated valve and pipe work. Please note the "strainer" which is designed to protect the pump from foreign matter, which might cause a stoppage, by pump break down. The strainer must be cleaned on a regular basis.

The pump controls will, normally, be duplicated in the refuelling cabinet. This permits an emergency shut down capability from both positions. All the equipment, including the pumps, motors and the associated pipe work must be of an approved type and all seals, gaskets and materials must be compatible with JET A1 fuel.

To prevent any overheating of the fuel in the pump when there is no fuel flow, the pump must be shut off as each refuelling operation is finished.
Typically the capacity of the pump unit should be 200-250 litres per minute.(60 Igal.)

Earth Proofing Unit
It is becoming increasingly common that the pump controls are coupled to an "earth proofing unit" which is designed to ensure that the fuel system has been electrically bonded to the helicopter before starting the fuel delivery. If the device cannot detect that an electrical connection has been made the pump will not work.



Filter water separator unit.
Figure no 21.

Fuel Filters

Filter Water Separator

This is a two-stage filter, designed to ensure a very high degree of cleanliness in the JET A1 fuel. There are various types in use. Figure 21, shows a cross section of one of these.

The vertical casing houses a two stage cylindrical "coalescer" filter element, through which the fuel passes from the inside to the outside of the element. The "coalescer" removes minute particles of dirt and sediment, down to 5 microns, and coalesces water into larger droplets, which sink to the bottom of the filter housing more easily.

The "separator" or "stripper" which is positioned next to the "coalescer" in the housing, further repels any water droplets that may still be in the fuel. Any water that may collect in the bottom of the filter unit must be drained off daily.

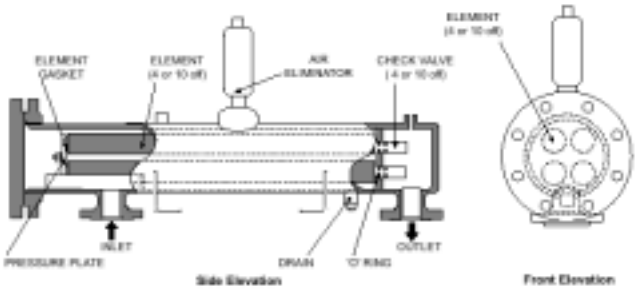
The filter unit is fitted with a "pressure differential gauge" as a method of checking the condition of the filter elements. This pressure must be monitored to ensure that servicing is carried out when required. Each manufacturer will establish replacement criteria for the elements, but these are typically 3 years or a differential pressure of 15 Psi. or more. Filters should be inspected, before further use, anytime there is a sudden large change in the differential pressure.

The water separator is normally equipped with an automatic "air eliminator" fitted to the top of the unit.

The coalescer element.

The separator or stripper element

Bag Type Filter Water Separator Element.
The working of a bag type filter is in effect the same as that of the standard type of element, the difference being that the "stripper" or "separator element" is in the form of a bag that fits over the "coalescer element".



The Filter Monitor.

The filter monitor combines filtration and clean up, with the capability to monitor and shut down the refuelling system should an unacceptable amount of free water be present in the flowing fuel. There are a number of different manufacturers and designs, but basically the working of the elements is the same. When water enters the filter it shuts down the flow of fuel, thereby eliminating the possibility that water could get into the helicopter.

The most common type for example, contains a battery of four (4) filter elements or cartridges, each 30 inches (76 cm) long and capable of absorbing particles down to 1.5 microns. If the incoming fuel contains water a paper-like layer in the filter element absorbs it. When the layer becomes saturated with water the element will no longer allow fuel to pass through.

Another type, which may still be found in use, is the "fuse" type. If the incoming fuel contains water above the permitted limits, a water sensitive fuse will rupture and release a spring loaded popped type valve, which will pass, under spring force, along the center of the element and shut down that element. Due to the fuel pressure it will remain closed. When the water affects the other elements they too will shut down.

In all cases, as the elements shut down, the differential pressure will increase and eventually the flow of fuel will stop. From this you will see that it is of great importance to maintain a constant check on the differential pressure during refuelling. The condition of the filter, in terms of dirt accumulated, will also cause an increase in that differential pressure, but usually at a slower rate.

The manufacturer specifies the life limits of the filter elements. Commonly, the limits are 15 psi or 1.1 bar differential pressure or 3 years since manufacture. Any time that a sudden large change in the differential pressure is noted the filters should be re-inspected before further use.

Ancillary equipment

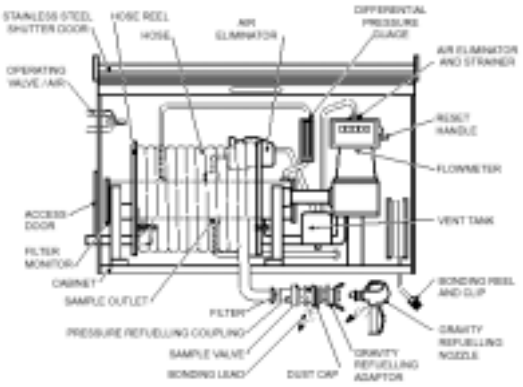
Automatic Air Eliminators

Filter vessels, as well as other large vessels within the system, are usually equipped with automatic air eliminators to prevent the build up of air within the system. Excessive air in the system can reduce the efficiency of the pump(s), and can lead to condensation and water, or fungal, contamination.

Differential Pressure Gauges

Filters should always be fitted with a gauge designed to measure the difference in pressure between the upstream and the downstream sides of the falter. Such a gauge can give a global indication of the condition of the filter. Increases in the difference indicate that the resistance in the filter is increasing, usually as a result of the filter doing its job. Decreases in the difference indicate that the resistance in the filter is decreasing. This could indicate a break down in the filter.

The differential pressures should be monitored during refuelling. Sudden or large changes should be treated as serious and should be investigated before continuing with refuelling.



The dispensing cabinet.
Front view of dispensing cabinet.

The Dispensing cabinet
The refuelling / dispensing cabinet contains the metering unit, pressure gauges and control switches or levers, also fitted into this cabinet is the hose reel and static earthing reel. In the case of the above drawing the "filter monitor" is fitted inside the cabinet. In some installations the filter monitor is mounted externally. The monitor is always fitted in the horizontal position.

Aviation Fuel Hoses
The hose, which is used to deliver fuel to the helicopter, must meet the specification for aviation hoses for fuel delivery. (BS3158-1985-C) It must not be replaced by any other type of hose that does not conform to the specification.

The hose is normally made of rubber with an internal nitril coating. This coating is easily damaged if the hose is improperly handled. If the coating is damaged, then the fuel can start to break down the rubber. This internal damage is difficult to assess from the outside. The presence of black residue in the hose end strainer may indicate break down of the hose.

All aviation fuel hoses must be well maintained and regularly checked for damage and leakage. The hose should be kept under observation during the refuelling operation. If any defect or weakness is observed, refuelling should be stopped immediately, and the hose withdrawn from service. Hoses should be checked at frequent intervals at the operating pressure, and inspected and tested at higher pressure at 6 monthly intervals. This inspection may be carried out on shore. After the inspections the required certificates will be issued and must be kept in the installation fuel system administration. The hose is conductive to allow static charge to dissipate. The refuelling hose must be reeled in each time after refuelling to protect it from damage.

The Refuelling Nozzles.

The refuelling nozzle contains the last line of particle filtration, often referred to as the "cone filter" because of its shape. This strainer will filter any particles coming loose from the hose. If it is checked regularly, it can help diagnose problems with the hose.

Fuel nozzles should always be fitted with bonding cable equipped with an alligator clip or a plug. The cable must be long enough to work conveniently, and must be checked regularly for condition and electrical continuity.

Refuelling is carried out using either a pressure or gravity nozzle.

Pressure Nozzle or Coupling.
The "pressure nozzle", or coupling, is connected with a bayonet type fitting to a corresponding fitting on the helicopter fuselage. The fuel is pumped, under pressure, directly into the tank.

Because there is no contact between the fuel being delivered and air there is a reduced chance of a flammable, or explosive, mixture forming.

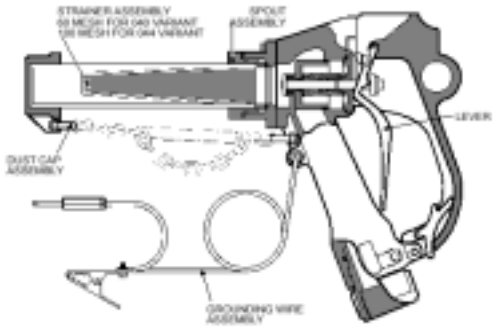
Because of its use in the fixed wing industry, for pumping fuel up into the wing of larger aircraft, the pressure nozzle is also known as an "underwing" nozzle

Example of a pressure refuelling nozzle.

Gravity Nozzle.
The "gravity nozzle" is similar to the type used for refuelling automobiles. This type of nozzle may be connected directly to the hose, or via an adapter to the pressure coupling.

During "gravity refuelling", the fuel is allowed to fall from the nozzle opening into the fuel tank of the helicopter. The combination of high delivery rate and air contact can result in significant amounts of vapor coming free during gravity refuelling. To minimize the risks, special care must be taken when gravity refuelling to ensure that the bonding connection is correctly made and that no spillage is occurs.

Because of its use in the fixed wing industry, for supplying fuel into the upper side of the wing of aircraft, the gravity nozzle is also known as an "overwing" nozzle



Example of a gravity nozzle.

Refuelling Equipment Inspection And Maintenance.

The condition of the refuelling system and the transportable tanks is the responsibility of the Helicopter Landing Officer. He or she must ensure that all items of equipment are inspected and maintained at regular intervals.

To ensure that high standards of maintenance are maintained, regulations require independent inspections of all offshore refuelling systems to be carried out at 6 monthly intervals (NL). It is common practice to have the normal maintenance carried out, at the same time as the inspection, either by or under the supervision of the fuel system inspector. The helicopter operator can, normally, supply telephone numbers and addresses for companies specializing in fuel system inspections.

Note:
Detailed instructions for the maintenance of the fuel system are beyond the scope of this manual / course. For more information contact the fuel system supplier, or inspector.

The results of the inspections, maintenance and any repairs must be recorded and held in the fuel system records kept on board. Independent inspection reports are also sent to the owner of the installation or vessel, the helicopter operator, and the civil aviation authorities of the country where the installation or vessel is operating.

If for any reason the fuel system develops a fault, and that fault prevents the supply of fuel, the helicopter operator must be informed as soon as possible. This will enable the operator to change flight plans accordingly.

Every 6 months (NL) the transportable tanks must be inspected by an authorized inspector who will issue an "aviation tank certificate". This certificate must be available for inspection by the helicopter operator's inspector. The certificate should be kept in the document container. Each time a tank is returned for re-filling it will be inspected and certified as suitable for re-filling with aviation fuel. This is to safeguard against the effects of damage during transportation.

Summary Of Routine Equipment Checks And Inspections.

Each company should have a schedule of routine equipment inspections and checks for the refuelling system. What follows are typical examples of the checks which should be included:

Each Day:

- Drain the designated fuel system sumps daily.
- Transportable tank – ventilate to remove any vacuum
- Filter water separator – with system under pressure
- Filter monitor - with system under pressure
- Hose end or the clean side of the filter monitor - with system under pressure
- Carry out the required quality control checks for contamination of the fuel.
- Visual checks
- Shell Water Detector
- Measure or calculate the amount of fuel available for use.
- If possible during the refuelling operation, maintain a constant check of the pressure differentials. If there is any sudden change in the readings, the system must be shut down and an investigation made for the cause of the pressure change.
- If the unit is fitted with two pumps. The pumps must be used alternately each day. This will help to prevent any build up of bacterial growth.

Each Week:

- Record the pressure differentials across both the filters. If the pressures are approaching the limits, arrange for filter replacement. Consult the fuel system supplier for the filter limits. (Typically 15 psi)
- For pneumatic systems. Check air line lubricant and top up if required.
- Check air lines for pressure and leakage.
- For electrical systems. Check the cabling for damage.
- Remove any water that may have collected in the bottom of the cabinets.
- Lubricate the roller doors if fitted.
- Check the fuel hoses for damage or leaks.
- Clean the strainers and hose end filters.
- If the unit is fitted with a "hand pump" the pump must be operated at least once a week, this will help to prevent the build up of bacterial growth.

Weekly Hose Check.
The weekly hose check should be carried out in the following way:

- Fully extend the hose and apply full pump pressure.
- Form a loop in the hose so it can be walked along for inspection
- Inspect the hose for damage, soft areas, cracking, blistering and leaks.
- Pay particular attention to the first and the last 2 meters, also checking the coupling.
- Check the end couplings for slippage and misalignment.
- Clean and check the hose end filters.

Each Month.
Each month the following inspection and maintenance checks must be carried out:

- Remove the strainer and clean with JET A1 fuel.
- Grease the fuel pump if required.
- Check the pump unit for leakage.
- Clean the air line moisture trap.
- Top up the air line lubricator if fitted.
- For electrical units check cables and junction boxes.
- Check the bonding jumpers along the fixed piping for corrosion.

Upon Receipt of a Transportable Tank

- Each "transportable fuel tank" must be inspected for damage and for contamination of the fuel.
- The contamination checks must be carried out after the required "settling time" has been observed.
- Settling time is 1 hour for each 30 cm of fuel in the tank with a minimum of 2 hours.

Recording Of The Checks And Inspections.

After carrying out the above checks and inspections, record the results in the fuel system administration, and make it available on request to the fuel system inspector.
The form "Daily fuel quality check and delivery coupon" must be completed and available for inspection at all times. A member of the helicopter crew as a method of confirming that the required checks have been carried out must also sign the form.

Stock control.
It is required that the aviation fuel available on a offshore installation or vessel be enough for the daily requirements. If for any reason a long period of inactivity is anticipated, then aviation fuel stocks must be run down.
All tanks should be dipped each day and a record kept of the amount of fuel that is available. This information must be readily available at all times.
When aviation fuel remains unused for a period of up to 4 months, the fuel tank should be returned to the supplier for laboratory test to confirm the specifications of the fuel.
Where aviation fuel remains unused for a period of six months, the fuel tank must be returned to the fuel supplier for disposal.

Note:
Dipstick caps must always be replaced after use.

Cleaning and Maintenance of the Filter Elements
The cleaning and maintenance of the fuel system in general and the filters in particular is usually done by a qualified and approved fuel system inspector. The procedures used fall outside the scope of this course and will not be covered.

Helicopter Refuelling Procedures.

The Refuelling Team.

It is recommended that at least two persons be available and briefed, to carry out the refuelling operation. The team will then consist of:

- The Helicopter Landing Officer. Who is in charge of all the operations on the Helideck, and is responsible for the fuel quality checks, and the co-ordination with the helicopter crew.
- Attendant No 1.- "The refueller" Carries out the actual refuelling on instructions from the Helicopter Landing Officer. Controls the hose end, and bonding cable.
- Attendant No 2.- "The refuelling system operator" Controls the pump and monitors system instruments. A member of the fire may carry out this function / rescue crew provided the person also has quick access to the fire fighting system controls.

A hand held powder extinguisher should be available close to the refuelling position of the helicopter. The layout of some helidecks may make it necessary to have extra personnel available as fire fighters.
The pilot will pass on information regarding the fuel requirements of the helicopter to the Radio Operator during the approach to the installation or vessel.

Duties Of The Helicopter Landing Officer During The Refuelling.

- The Helicopter Landing Officer is in charge of all helicopter-refuelling operations. (S)he should position him or herself where (s)he can see the pilot, the refuelling system operator and the refueller.
- Immediately before refuelling, takes a hose end sample in the presence of a crewmember. If pressure refuelling is used, a sample may be taken from the clean side of the filter monitor.
- During the refuelling (s)he ensures that the operation is carried out in a safe and efficient manner, checking items such as correct bonding and the use of "safe routes".
- On the completion of refuelling, checks the fuel caps.
- Takes a hose end sample to confirm the quality of the fuel loaded.
- Completes the "Daily fuel quality check and delivery coupon". Records the amount of fuel loaded, signs the daily log sheet and presents it to a member of the helicopter crew for signature
- After a member of the helicoptercrew has signed the coupon, checks that all refuelling equipment has been cleared from the helideck.

Duties Of Attendant No 1. – The Refueller

- On instructions from the Helicopter Landing Officer connects the bonding cable to the designated earthing point on the helicopter.
- After the "hose end sample" has been taken, runs the refuelling hose out to the helicopter, connects the nozzle bonding wire to the correct point on the helicopter, opens the tank cap and places the nozzle in the tank.

Note:
It is recommended that during rough weather two persons should handle the hose end.

- On the signal from the Helicopter Landing Officer commences the refuelling.
- On a signal from the Helicopter Landing Officer, stops refuelling.
- Removes the refuelling nozzle, closes the tank cap, removes the nozzle bonding lead and rewinds the hose
- On instructions from the Helicopter Landing Officer, he or she disconnects the main bonding cable and rewinds it.

Duties Of Attendant No 2. – The Refuelling System Operator

- Starts and stops the refuelling pump on a signal from the Helicopter Landing Officer.
- Monitors the differential pressures across the filters during refuelling, and records them on the "daily fuel quality checks and delivery coupon".
- In the event of any sudden changes in differential pressure, stops refuelling.
- Stands by to shut down the system, if so required.

Duties Of The Fire And Rescue Team.

Depending on the equipment or layout of the helideck it may be necessary to have extra personnel man the fire fighting equipment during refuelling operations to ensure that lag time is minimized in the event of a fire.

- Acts quickly and efficiently following the instruction of the Helicopter Landing Officer according to the fire fighting procedures.

Safety During Refuelling.

Remember: "safety first":

- Always use the safe areas when refuelling.
- Extra personnel must be available in storm conditions.
- Always use the correct bonding procedures.
- Always roll up the refuelling hose and stow in the correct manner.
- Know your escape route

Static Electricity.

In certain conditions, when two electrically charged bodies are brought together a spark can occur. This spark could also be caused by the discharge of static electricity.

This charge can build up by movement, which causes friction. Thus, the flow of air over the helicopter rotor, the surge of fuel in the tank, flow of the fuel through the pipe lines and hoses can all create static electrical charges. These charges, if not effectively earthed, may discharge to adjacent parts in the form of a spark with the consequent risk of fire when near flammable substances such as aviation fuel.

The danger of fire caused by faulty or non-effective bonding or negligence in carrying out the bonding procedures, cannot be too strongly emphasized.

All pipe work and major components such as pumps, filters, meters, etc. must be earthed.

Each refuelling unit is supplied with a bonding reel and clamp. Connect this clamp to the recommended earthing point on the helicopter before the hose is reeled out and connect the nozzle bonding cable before opening the tank cap.

Note:
All bonding connections must be firm and made on un-painted parts.

General Safety Precautions During Refuelling.

- Ensure that all passenger movements have stopped before refuelling begins.
- All the refuelling personnel must be thoroughly trained in the refuelling procedures and quality control of the fuel.
- When refuelling with turning rotor blades, all movement from one side of the helicopter to the other must be via the "safe routes", and under no circumstances will personnel work in the proximity of the tail rotor.
- All personnel working under the main rotor must exercise extreme caution.
- Refuelling must be stopped if any fuel is spilt, and not re started until that fuel has been cleaned up.
- The refuelling pump should be switched off as soon as the refuelling has been completed, this will prevent any overheating of the fuel in the pump.
- External power supply units may not be connected to the helicopter during the refuelling operation

Refuelling With Passengers On Board The Helicopter.
Special care is required it the refuelling operation is to be carried out with passengers on board the helicopter. It is important that a cabin door is open during the operation. The Helicopter Landing Officer must ensure that during refuelling no passenger movement takes place. If there is any doubt regarding safety, the refuelling must be stopped until it is judged to be safe to continue.

In some cases, in the interests of safety, the operator of the offshore platform or vessel will require "pressure refuelling".

Clear Exit Path

The HLO should ensure that a clear path is maintained from the aircraft to allow for quick removal of fuelling equipment in an emergency. All equipment should be positioned to allow the unobstructed exit of persons from the aircraft in an emergency.

Anti-Icing Additives
In certain circumstances, an "anti-icing" additive, such as PRIST, QUELL,SHELL MG-100, may have to be added to the fuel. A number of helicopters are not equipped with a fuel heating system, for that reason the forming of ice particles in the helicopter fuel system by low outside air temperature is possible. The use of an additive avoids this phenomena. As an example, the Sikorsky S76 helicopter, will require the additive when the air temperature get + 4° C or lower.

In order to be effective the additive must be proportioned into the fuel at the time of fuelling the helicopter. The additive aerosol containers have constant rate of discharge when the dispensing button is depressed that is appropriate for fuelling rates of 30 to 60 gallons per minute. When used as directed the contents will provide the recommended concentrations of 0.06%by volume minimum to 0.15% by volume maximum.

The additives are delivered in aerosol spray cans of 20 ounces, a separate plastic connecting tube with clip and valve button.

Note:
On board of Schreiner Airways' Sikorsky s76 helicopters, six spray cans and connecting tubes are packed in a container located in the cargo compartment.

Direction For Use:
- Remove actuator cap.
- Press valve button into valve on top of can.
- Place clip with tubing onto fuel nozzle.
- To start flow press actuator down fully, to stop release actuator.
- Use can upright and start flow after refuelling begins and stop flow of additive a moment before refuelling stops.

Health and Safety Concerns

A number of the substances used in refuelling the helicopter require some care in handling:

Jet A-1 Fuel
Contamination of the skin by aviation fuel can cause chapping, irritation and possibly infection. There is a great danger of this occurring if fuel soaked clothing is kept on after the soaking.

First aid treatment is essential:

- Always wash off any fuel from the skin, however small with soap and water as soon as possible.
- Any contaminated clothing must be removed at once and laundered before re-use. Clothing that is soaked with fuel must be removed while standing under a running shower to avoid any hazard as a result of a static electrical spark
- Never expose the skin to prolonged contact with fuel, wear protective gloves and use barrier cream. Do not keep wipers in the pockets of clothing.

Anti Icing Additives

Anti-icing additives are known under different brand names such as PRIST, QUELL, SHELL MG-100, etc. but all are based on Ethylene glycol monomethyl ether.

Ethylene glycol monomethyl ether is a toxic compound which can affect brain, blood and kidney functions. Persons exposed to excessive concentrations have exhibited such neurological symptoms as drowsiness, fatigue and white blood cell immaturity. Chronic affects include anemia with heightened fatigue, erratic reflexes and tremors. In addition to vapor inhalation, ethylene glycol monomethyl ether also can be absorbed through the skin. Irritation to the skin, eyes and mucous membranes may result.

Due to the nature of these additives it is strongly advised to wear protective clothes, gloves and safety goggles during handling.

In case of skin contact, the affected area should be thoroughly rinsed with water immediately, and impregnated clothing should be removed and cleaned before re-use. If there is any doubt, contact a physician as soon as possible.

Fuel Spills

In the event of a fuel spill, whether on the airport ramp or an offshore installation, each spill will have to be treated as an individual case because of such variables as size of the spill, type of liquid involved, wind and weather conditions, aircraft occupancy, equipment and personnel available.

Within the confines of every fuel spill, there is an area where fuel and air have combined to form an explosive mixture. The only element necessary to produce ignition is a spark.

Every spill, no matter how small, should be treated as a potential fire source.

Fuel fumes/vapors are heavier than air and will seek the lowest level and remain there until dispersed.

Fuel Spills Less Than 18 Inches In Any Direction:
Usually fuel spills of this nature are considered minor. They can be spread and left to evaporate or can be cleaned up with absorbent cleaning agents, depending upon the particular situation.

Avoid all sparks or sources of ignition within 50 feet until the fuel is evaporated or cleaned up.

Spills over 18 inches but under 10 feet in any direction or under 50 square feet in total area, and not of a continuous flowing nature:
If the fuel spill is within 50 feet of an aircraft, or in an area of high hazard, post a fireguard up-wind of the spill with adequate fire extinguishing equipment at hand. One 150 pound dry powder extinguisher is the minimum required. Avoid all sparks or sources of ignition within 50 feet until the spilled fuel is made safe for cleaning up. The fuel spill should be cleaned up with absorbent cleaning agents.

Spills over 10 feet in any direction or over 50 square feet in area, or of a continuous flowing nature:
If the spill is within 50 feet of an aircraft, evacuate the passengers and crew. Post a fireguard up-wind of the spill with adequate fire extinguishing equipment on hand (150 pounds dry powder). Neither an idling aircraft, nor any idling automotive, electrical, nor spark producing equipment in the area should be started before the spilled fuel is removed. The fuel spill can be cleaned up with absorbent cleaning agents.
A good safety practice is to not activate any electrical switches unless absolutely necessary.

Fuel soaked absorbents should be placed in a closed metal container and than removed to a safe area. Local regulations will determine the final disposition of these absorbents.

Sending Samples by Air.
Any samples taken for laboratory testing onshore, should be transported in a 1-liter glass (correctly packed) or plastic container, or a 4 liter lined metal container. These must be labeled correctly (see chapter 7 of this handbook Transport of special loads.) to show that they contain JET A1 aviation fuel, and the caps should be sealed.

The Regulations as They Apply to Refuelling.

The Netherlands.

Clearly establish the requirements for helicopter refuelling units, if and when installed, on "mining" installations or vessels involved in mining related activities. Regulations: Mijnbouwbesluit, ARBO besluit verkeer en vervoer and Dutch Aviation Airlaw.

See:

- Dutch Aviation Law art. 18000
- Mijnbouwbesluit § 4.4

The United Kingdom.
The offshore installations (operational safety health and welfare) regulations 1976 no 1019.

These regulations require that:

A. There is on board, sufficient helicopter fuel to enable the helicopter to be flown to a landing place onshore. Regulation 22-9 (a).
B. The refuelling equipment is in a safe and efficient condition, and that the quality control equipment is available for use. Regulation 22-9 (b).
C. The Helicopter Landing Officer shall report any shortage of fuel or deficiencies in the refuelling equipment to the Offshore Installation Manager or ships captain. Regulation 22-10.
D. All persons engaged in helicopter operations, or who are on or near the helicopter landing area, shall be under the immediate and effective control of the Helicopter Landing Officer. Regulation 22.

Reference publication.
Cap 434. Aviation fuels at aerodromes.

Norway.
The Norwegian Maritime Directorate. Dated 10 september 1973 and its amendments, cover the "safe practices" for offshore drilling installations.

The refuelling of helicopters is covered by article 3 of the above regulation.

Article 3.2.2.1. Fuel minimum flash point.

Article 3.2.2.2. Positioning of the refuelling unit.

Article 3.2.2.3. Storage tanks.

Article 3.2.2.4. Transportable fuel tanks, inspection routines.

Article 3.2.2.5. Storage tanks and pump units, collection of spillage.

Article 3.2.2.6. Positioning of vent pipes.

Article 3.2.2.7. Remote shut down facility.

Article 3.2.2.8. Pumping system.

Article 3.2.2.9. Explosion proof pumps.

Article 3.2.2.10. Operation of system from helideck level.

Article 3.2.2.11. System pressure relief valves.

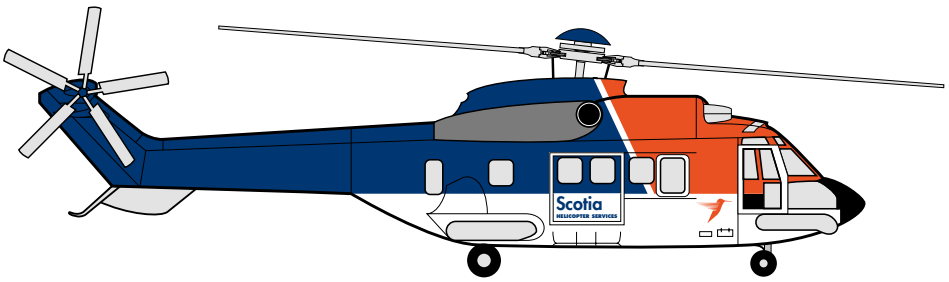
Denmark.
Regulations for Civil Aviation (BL) 3-6. Refuelling of aircraft etc.

Chapter 9

Helicopter type Information

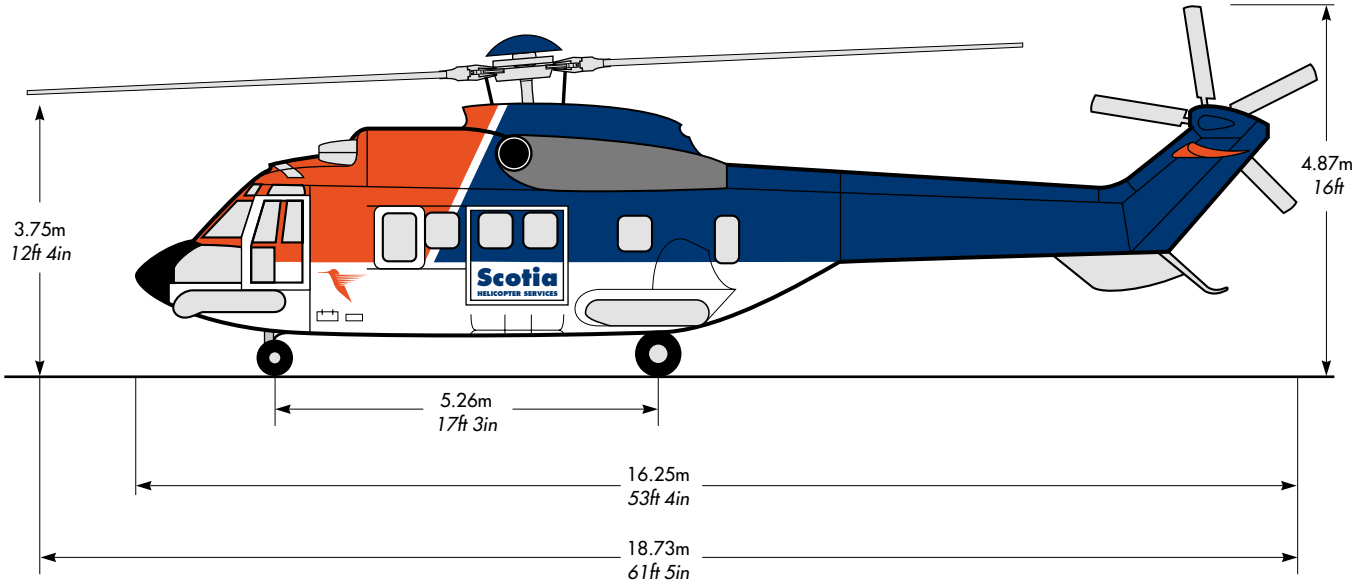
Eurocopter AS332L Super Puma
Information Sheets

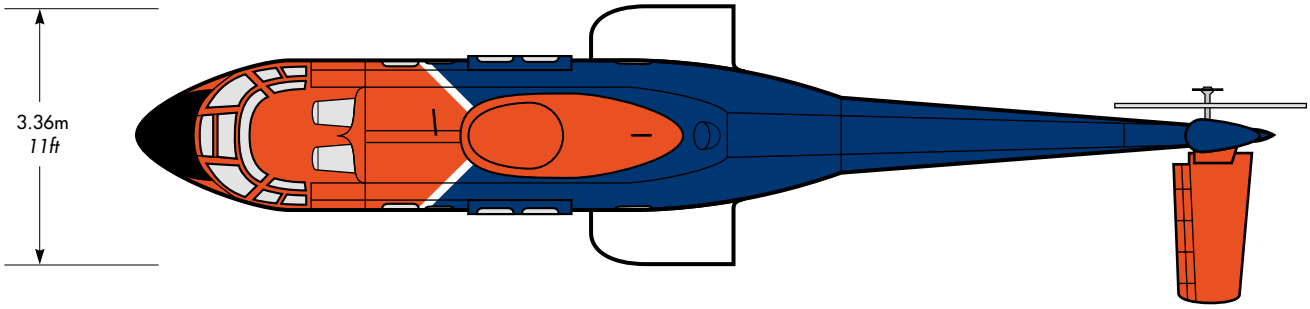
Scotia
HELICOPTER SERVICES

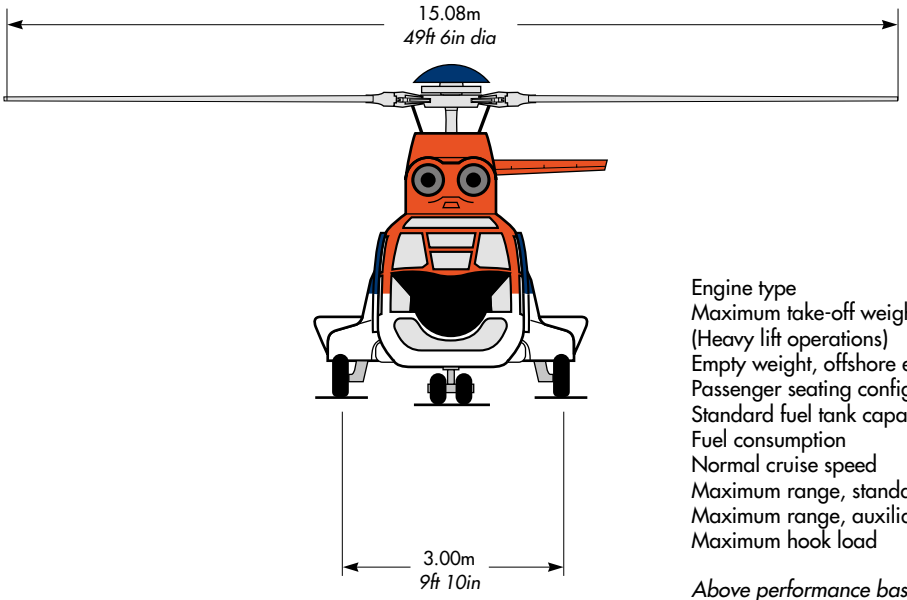


Eurocopter AS332L Super Puma
Technical Specification

Scotia HELICOPTER SERVICES







Engine type	**2 x Turbomeca Makila 1A**
Maximum take-off weight (MTOW)	**8600kgs**
(Heavy lift operations)	**9350kgs**
Empty weight, offshore equipped (average)	**5475kgs**
Passenger seating configuration	**18**
Standard fuel tank capacity	**1846kgs**
Fuel consumption	**480kgs/h 1020lbs 580l**
Normal cruise speed	**130kts**
Maximum range, standard tanks	**460nm**
Maximum range, auxiliary tanks	**595nm**
Maximum hook load	**4500kgs**

Above performance based on 1000ft ASL, ISA, still air conditions.
Range calculated with IFR reserves.

Eurocopter AS332L Super Puma
Specification

Scotia
HELICOPTER SERVICES

General features
- 2 tonne and 4.5 tonne cargo hook
- Pressure refuelling
- Rescue hoist (optional)
- Two movable landing lights
- Central auxiliary fuel tank

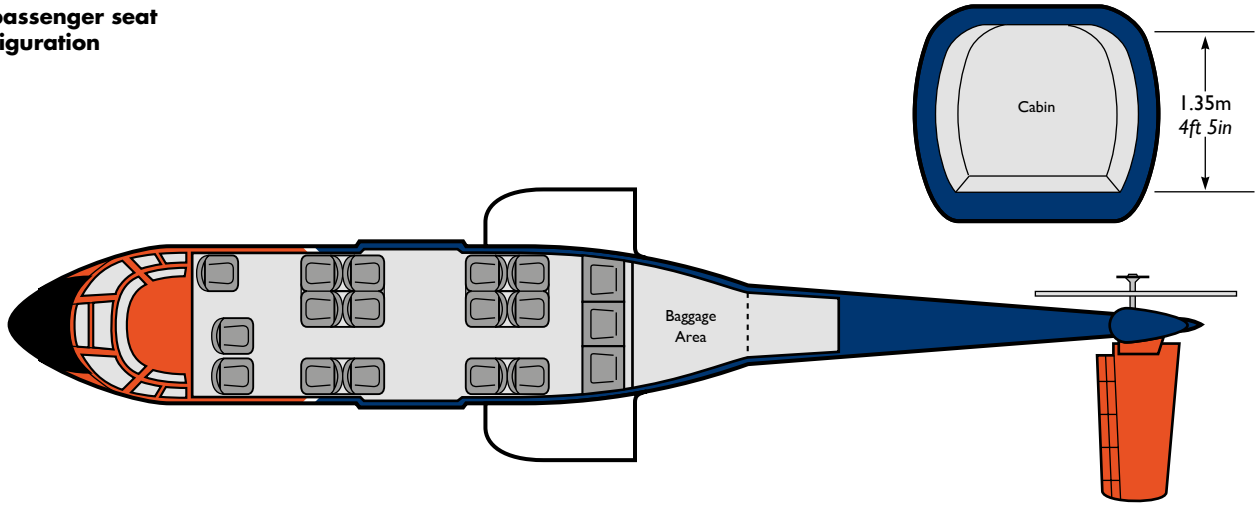
Passenger and freight features
- 18 airline comfort passenger seats with upper torso restraints (UTR)
- Individual lighting and ventilation system
- Cabin heating
- Enlarged windows
- Light weight airline trim and additional soundproofing
- Extended rear baggage bay
- Cabin access through rear giving long load facility (26ft/8m long)
- Inclined rear seat backs

Safety features
- Emergency flotation system
- Strong wind kit (rotors engage up to 55kts for routine operations)
- Full windshield and fuel de-icing system
- Ice detection system
- Dual 14 man externally mounted liferafts (each with 21 man overload capacity)
- Four search and rescue beacons (SARBEs)
- Emergency locator beacon
- Icing protection
- Helicopter emergency egress lighting (HEEL)
- Automatic height voice alerting device (AVAD)
- Automatically deployable emergency location transmitter (ADELT)
- High visibility white strobe collision avoidance lights
- Cockpit voice flight data recorder (CVFDR/IHUMS)
- Autonomous secondary PA system

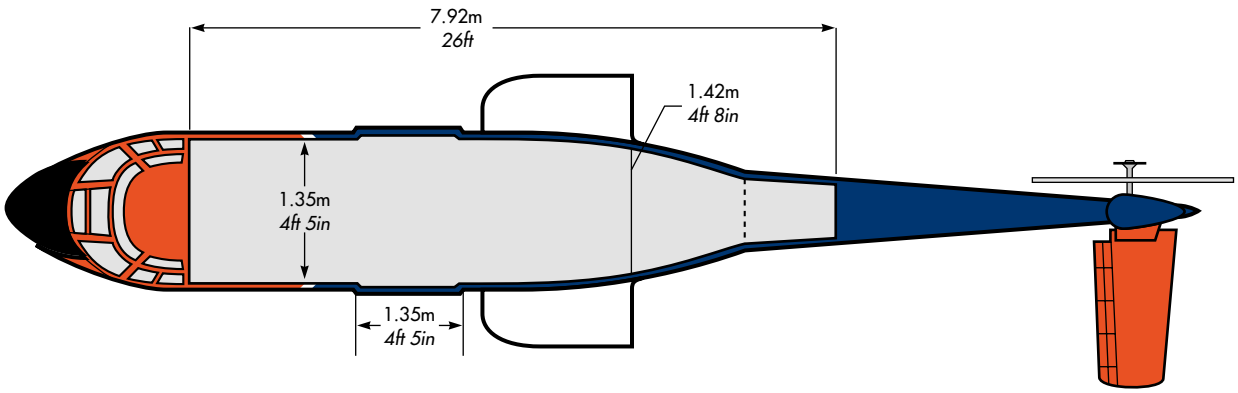
Eurocopter AS332L Super Puma
Seating/Cargo Layouts

Scotia HELICOPTER SERVICES

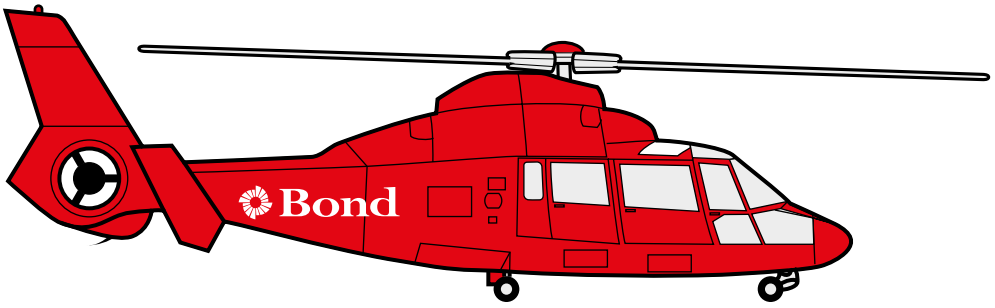
18 passenger seat configuration



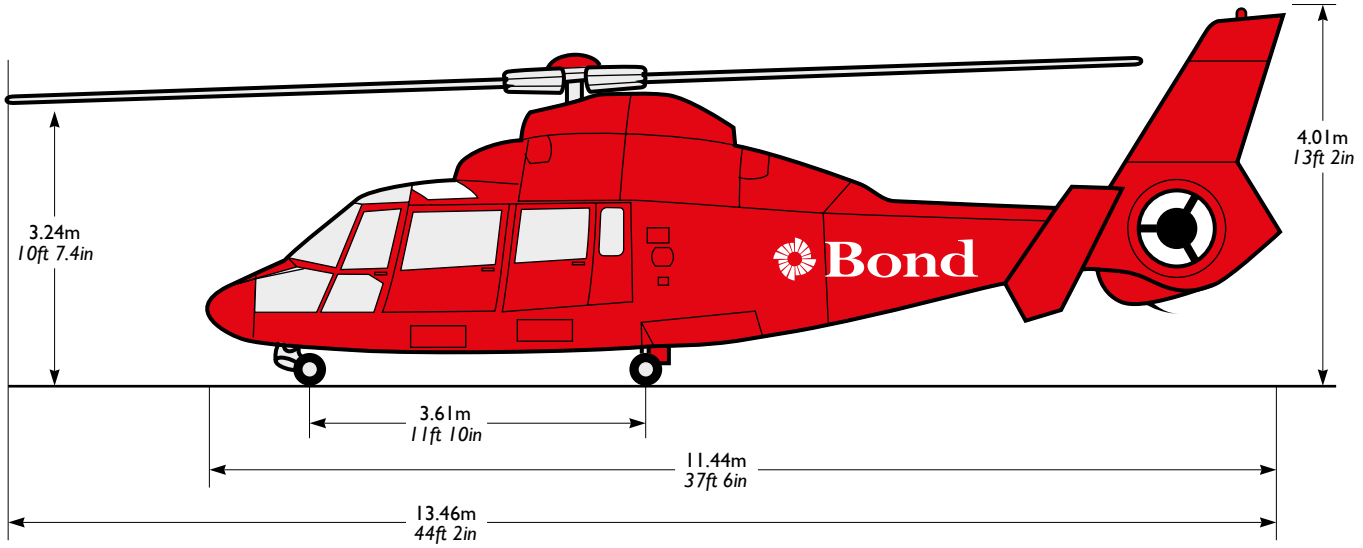
Cargo configuration
Baggage area
3.65m³/129ft³

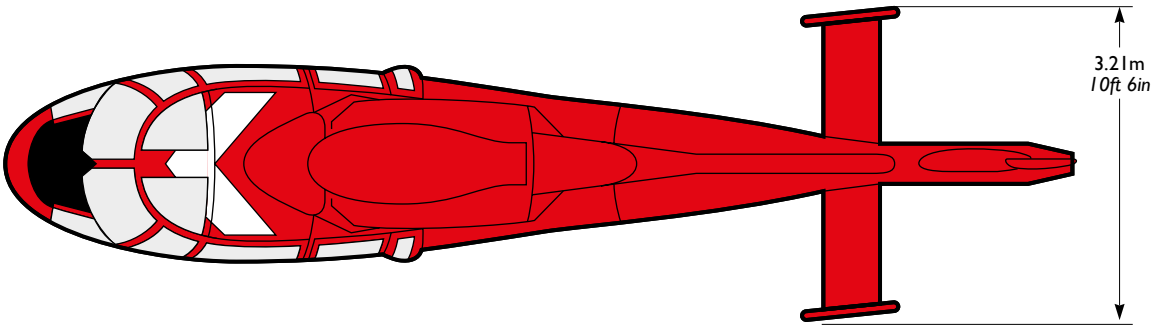


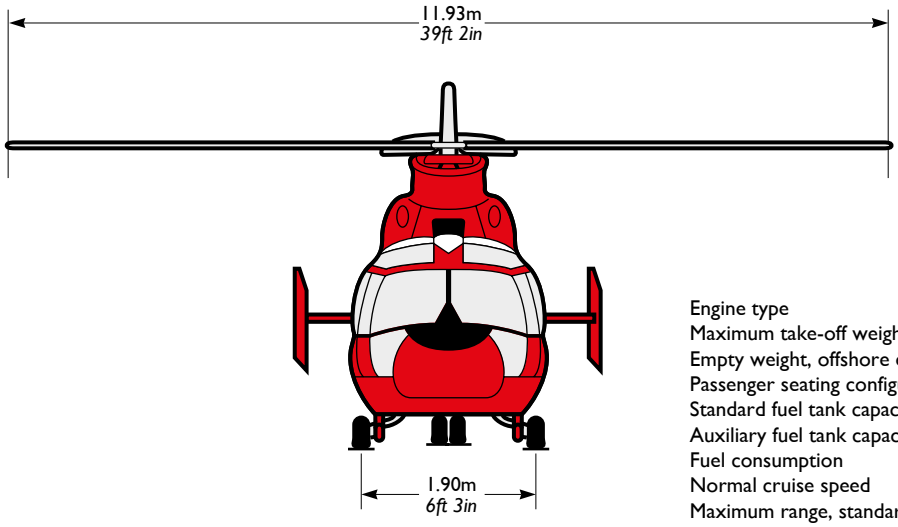
Eurocopter AS365N Dauphin
Information Sheets



Eurocopter AS365N Dauphin
Technical Specification







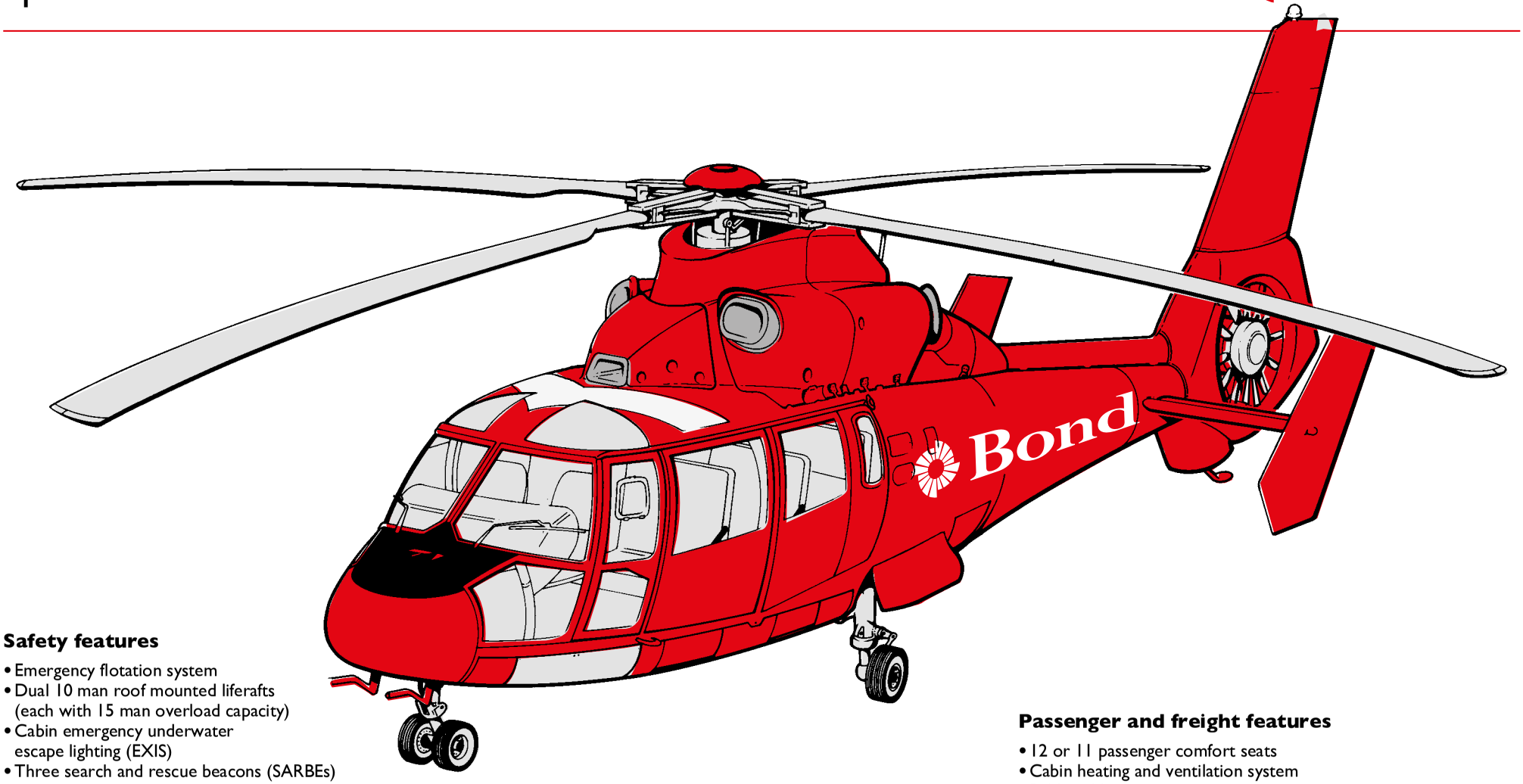
Engine type	**2 x Turbomeca Arriel 1C**
Maximum take-off weight (MTOW)	**4000kgs**
Empty weight, offshore equipped (average)	**2650kgs**
Passenger seating configuration	**12/11**
Standard fuel tank capacity	**905kgs**
Auxiliary fuel tank capacity	**142kgs**
Fuel consumption	**270kgs/hr**
Normal cruise speed	**135kts**
Maximum range, standard tanks	**395nm**
Maximum range, auxiliary tank	**460nm**
Maximum hook load	**1600kgs**

Above performance based on 1000ft ASL, ISA, still air conditions.
Range calculated with IFR reserves.

Eurocopter AS365N Dauphin

Specification

Bond



Safety features

- Emergency flotation system
- Dual 10 man roof mounted liferafts (each with 15 man overload capacity)
- Cabin emergency underwater escape lighting (EXIS)
- Three search and rescue beacons (SARBEs)
- Sonic locator beacons
- Automatically deployable emergency location transmitter (ADELT)
- Fuel jettison system
- Automatic height voice alerting device (AVAD)
- External white strobe collision avoidance lights
- Cockpit voice flight data recorder (CVFDR/IHUMS)
- Manual single action door jettison

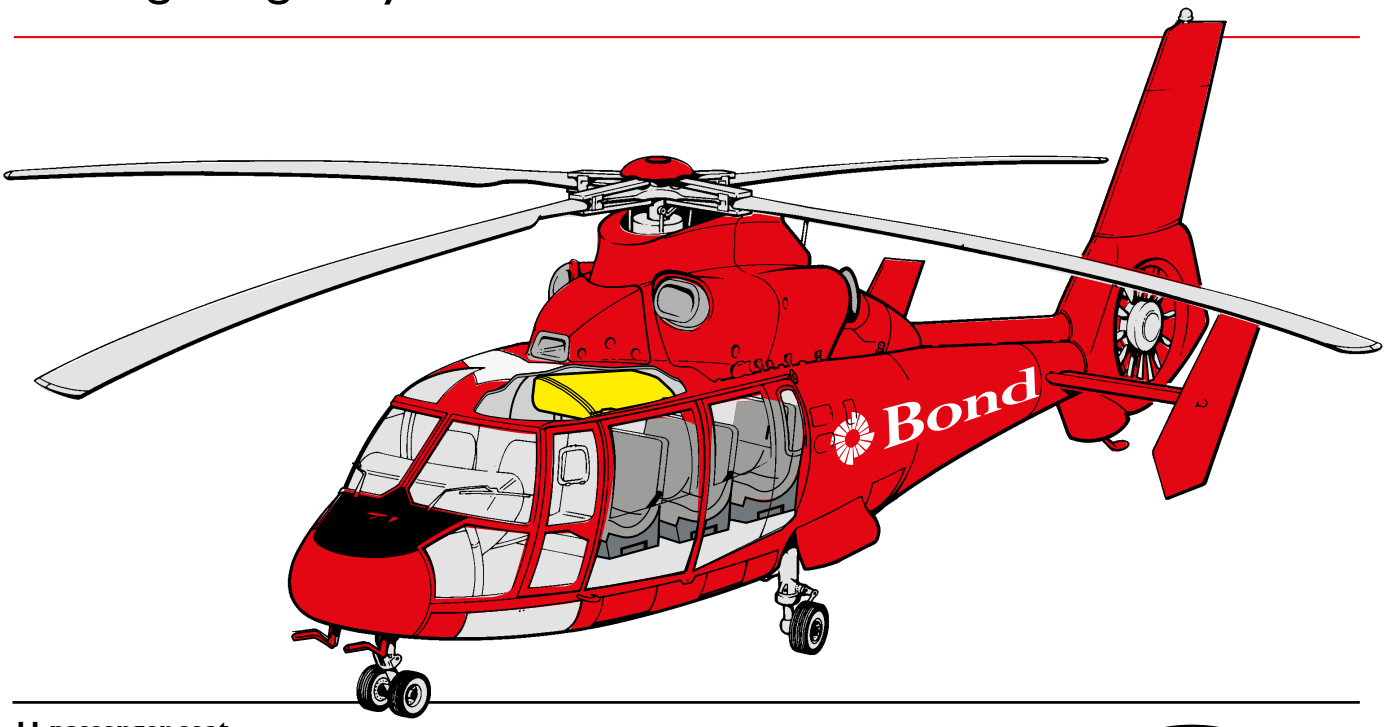
General features

- 1.6 tonne cargo hook
- Two movable landing lights
- Strong wind kit (rotors engage up to 55kts in routine operations)
- Rescue hoist (optional)
- Auxiliary fuel tank (optional)

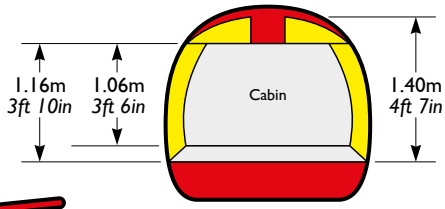
Passenger and freight features

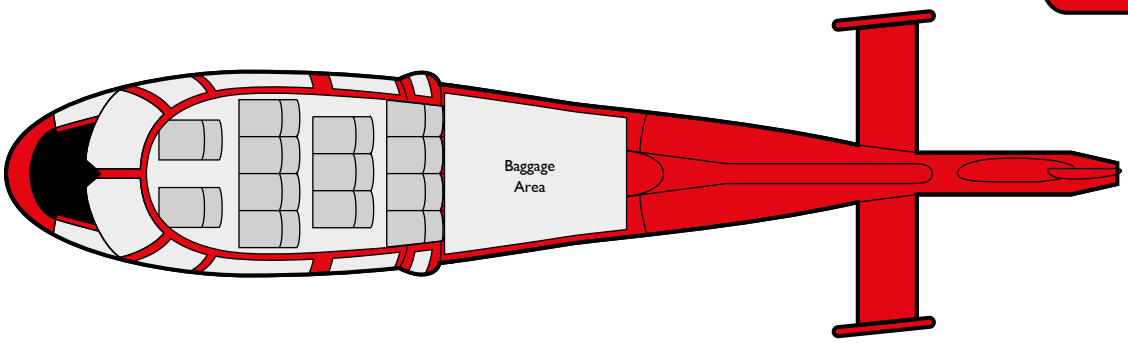
- 12 or 11 passenger comfort seats
- Cabin heating and ventilation system
- Public address system
- Enlarged rear 'bubble' door incorporating additional window
- Airline trim and additional soundproofing
- Quick-release passenger seats (for freight operations)
- Large rear baggage bay
- Six doors ensuring rapid and unrestricted passenger access
- Wide access into cabin for freight
- Large windows giving all-round visibility

Eurocopter AS365N Dauphin
Seating/Cargo Layouts



11 passenger seat configuration (sliding door optional)

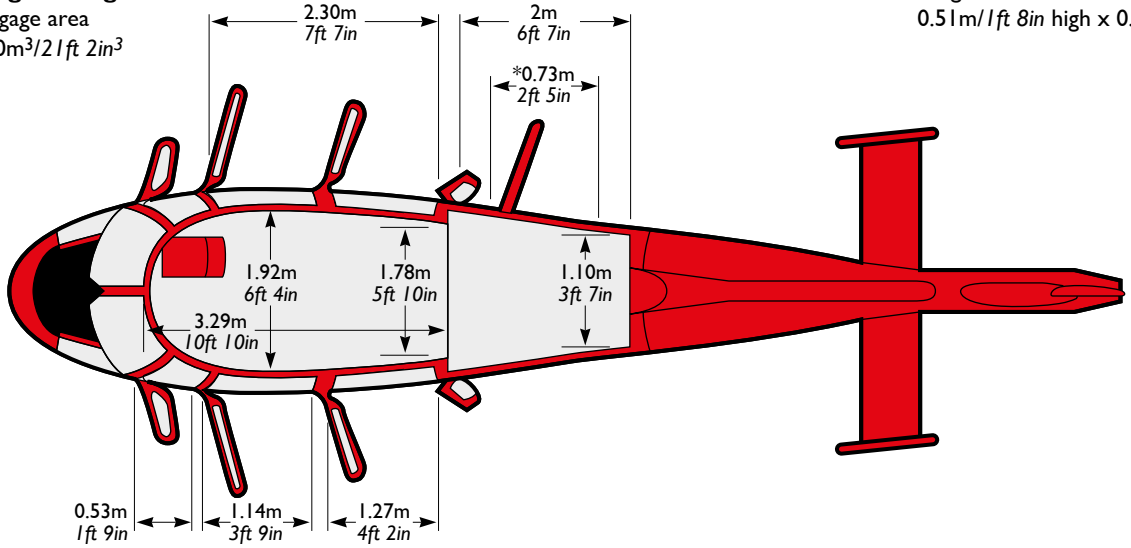




Cargo configuration

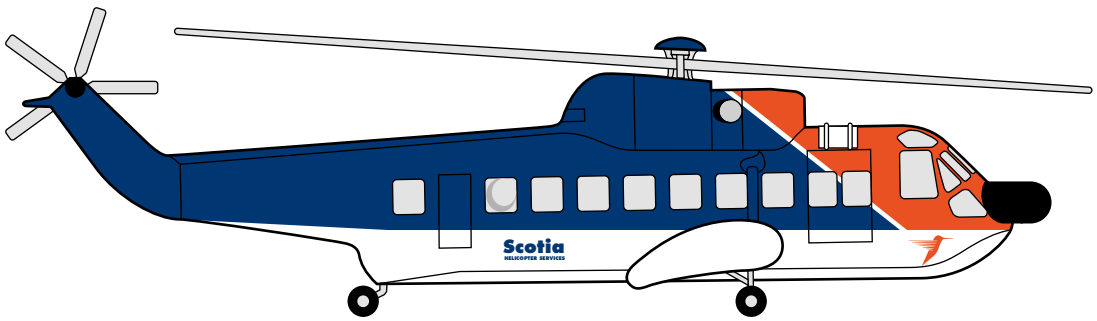
Baggage area
0.60m³/21ft 2in³

* Cargo door
0.51m/1ft 8in high x 0.73m/2ft 5in wide

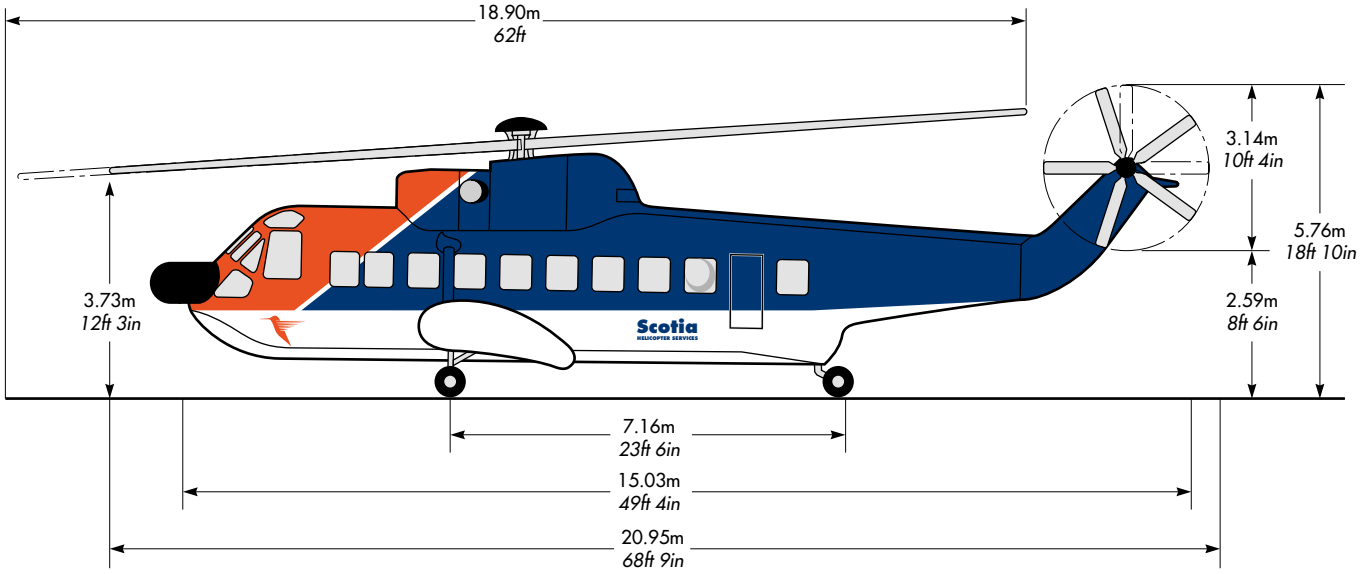


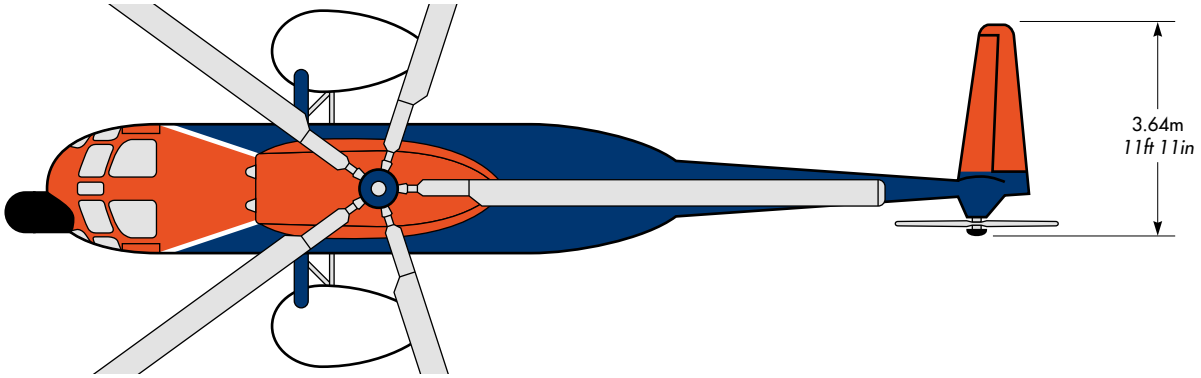
Sikorsky S61N
Information Sheets

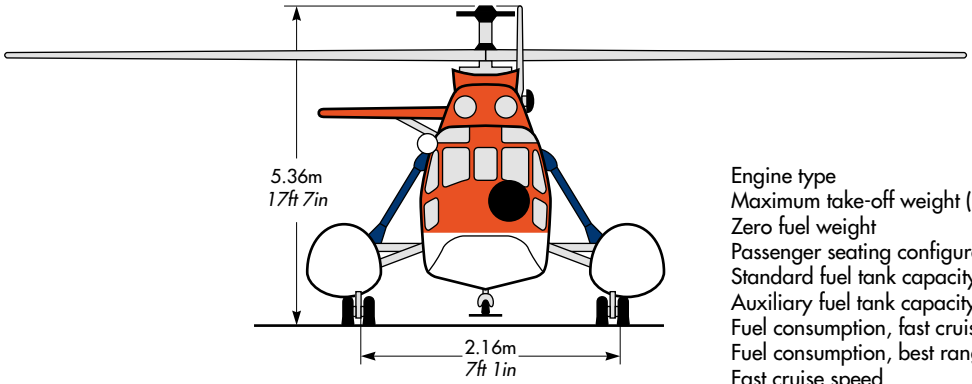
Scotia
HELICOPTER SERVICES



Sikorsky S61N
Technical Specifications







Engine type	**CT58-**
Maximum take-off weight (MTOW)	**20,500 lbs**
Zero fuel weight	**15,373 lbs**
Passenger seating configuration	**22**
Standard fuel tank capacity	**4200 lbs**
Auxiliary fuel tank capacity	**1100 lbs**
Fuel consumption, fast cruise	**1100 lbs/hr**
Fuel consumption, best range	**1050 lbs/hr**
Fast cruise speed	**120kts**
Best range speed	**115kts**
Maximum range, standard tanks	**370**
Maximum range, auxiliary tanks	**478**
Maximum hook load	**8000 lbs**

Above performance based on 1000ft ASL, ISA, still air conditions.

Sikorsky S61N
Specification

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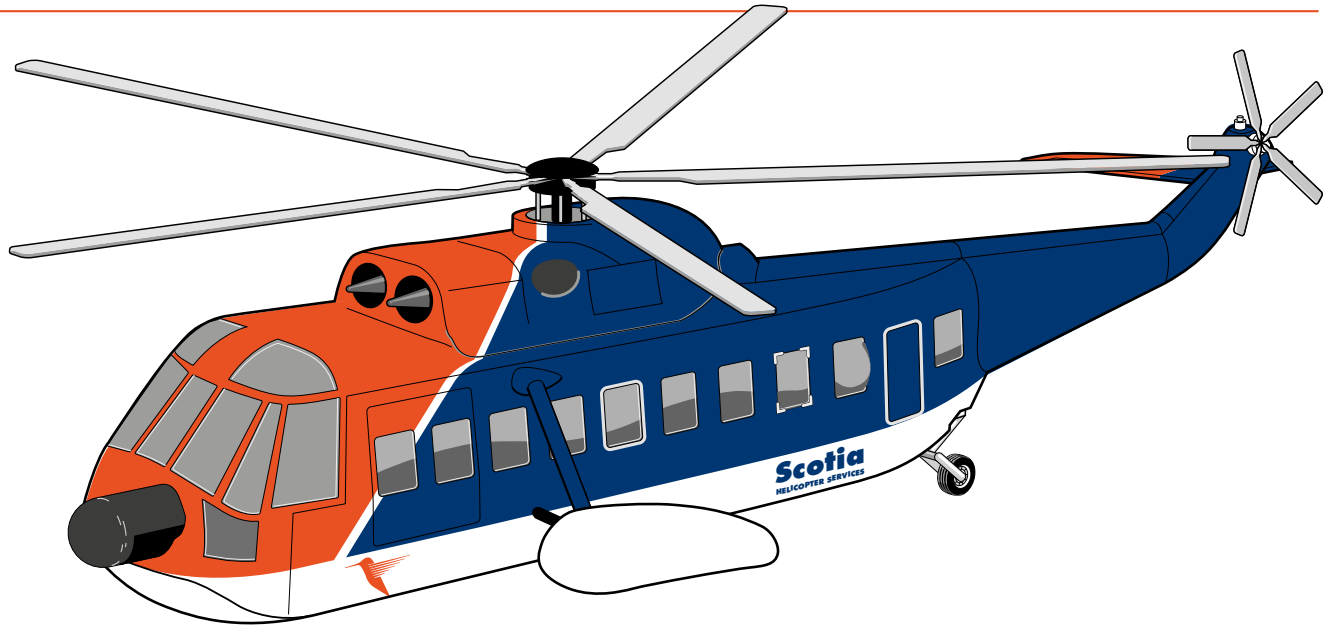
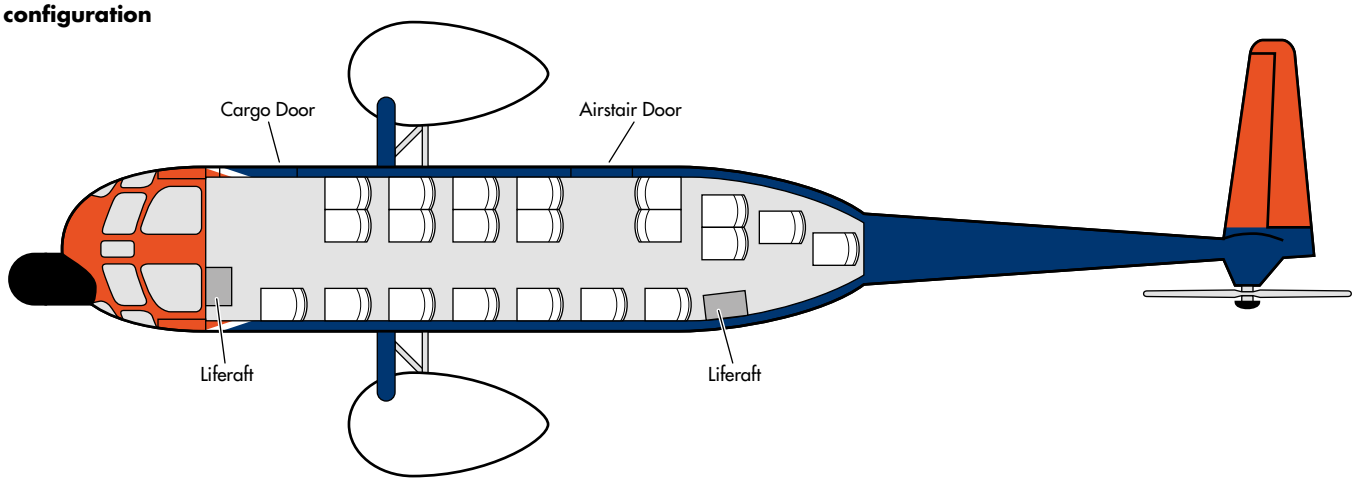
Sikorsky S61N
Seating/Cargo Layouts

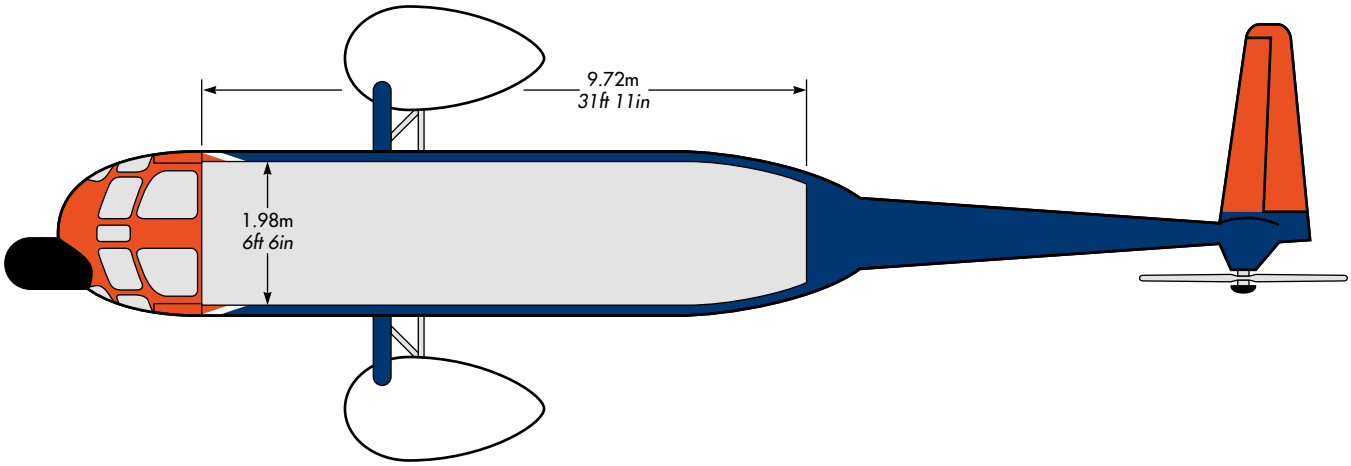
Scotia HELICOPTER SERVICES



21 seat configuration



Cargo configuration



Sikorsky S76A+
Information Sheets

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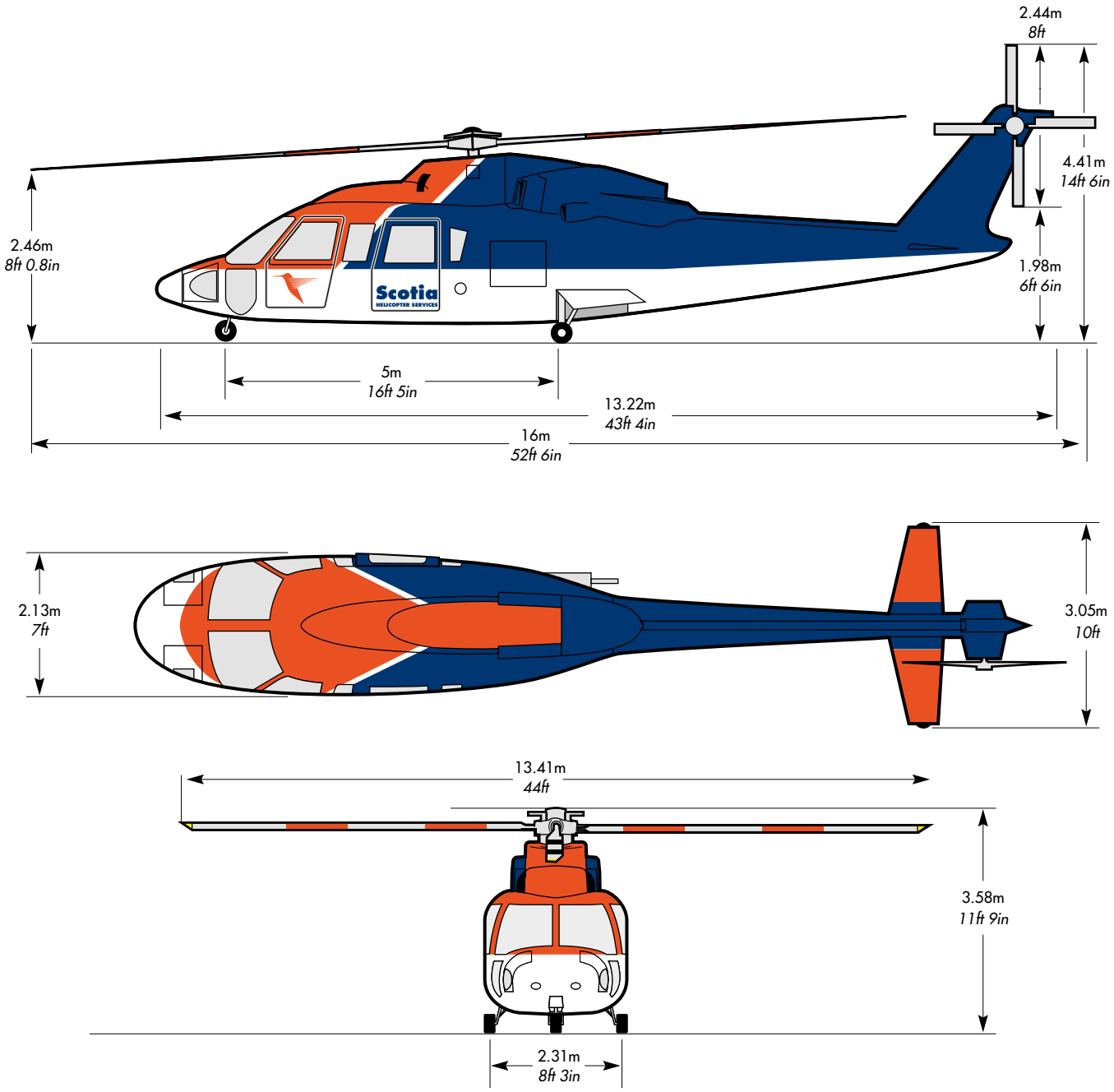
HELICOPTER SERVICES

Sikorsky S76A+
Technical Specification

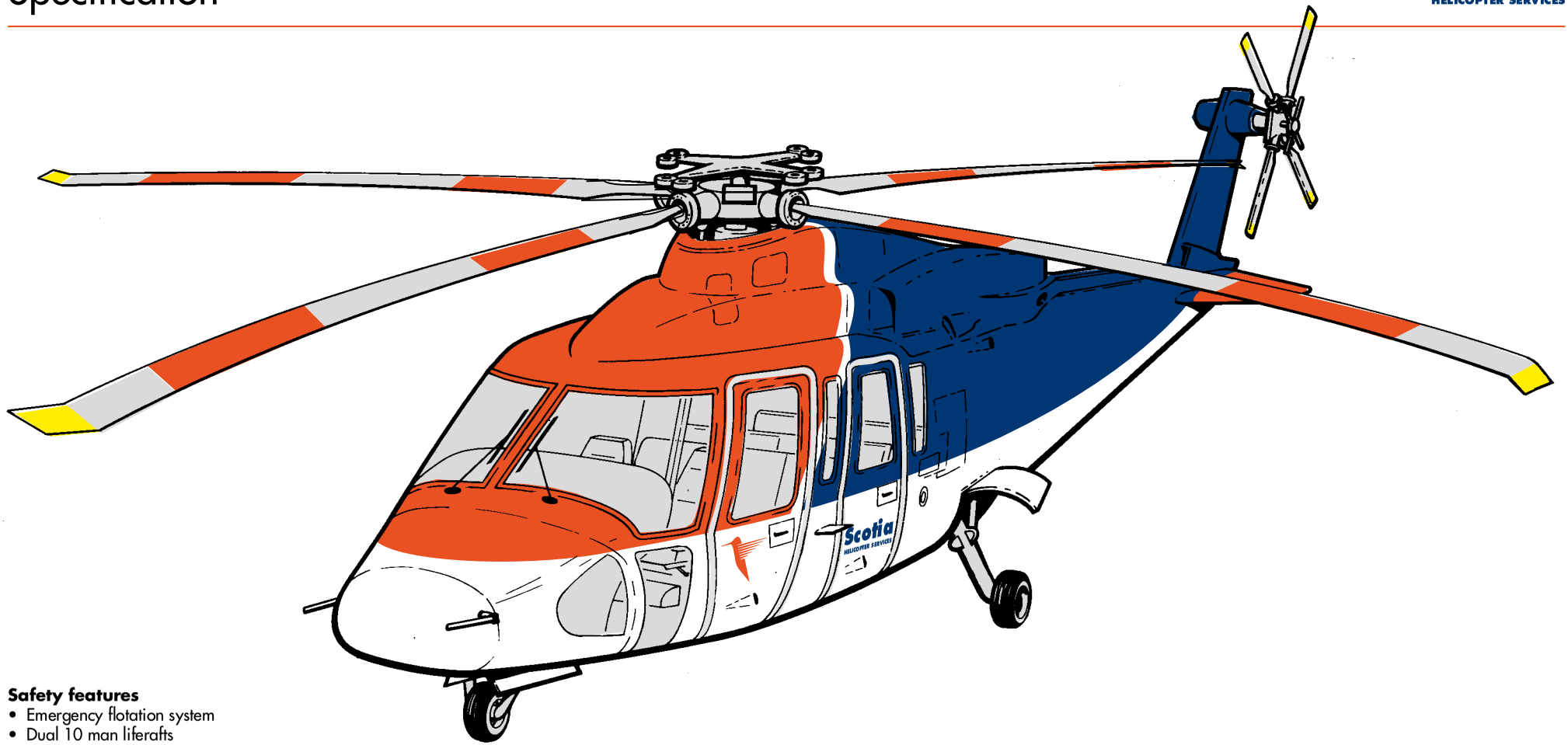


Engine type	**2 x Turbomeca Arriel 1s**
Maximum take-off weight (MTOW)	**10,800lbs**
Empty weight, offshore equipped (average)	**7100lbs**
Passenger seating configuration	**12**
Standard fuel tank capacity	**1830lbs**
Auxiliary fuel tank capacity (boot)	**350lbs**
Fuel consumption	**630lbs/hr**
Normal cruise speed	**140kts**
Maximum range, standard tanks	**360nm**
Maximum range, auxiliary tank	**430nm**
Maximum hook load	**3300lbs**

Above performance based on 1000ft ASL, ISA, still air conditions.
Range calculated with IFR reserves.

Sikorsky S76A+
Specification

Scotia
HELICOPTER SERVICES



Safety features
- Emergency flotation system
- Dual 10 man liferafts
  (each wiht 15 man overload capacity)
- Dual dinghy deployment system, with door jettison
- Cabin emergency underwater escape lighting (EXIS)
- Three search and rescue beacons (SARBEs)
- Sonic locator beacons
- Automatically deployable emergency location transmitter (ADELT)
- Automatic height voice alerting device (AVAD)
- High visibility white strobe collision avoidance lights
- Engine ice/snow protection
- Cockpit voice flight data recorder (CVFDR/IHUMS)
- Additional passenger emergency push-out windows

General features
- 3300lbs cargo hook
- Two landing lights (one movable)
- Auxiliary fuel tank (optional)

Passenger and freight features
- 12 passenger comfort seats
- Cabin heating and ventilation system
- Cabin public address system
- Airline trim and additional soundproofing
- Quick-release passenger seats (for freight operations)
- Large rear baggage bay (with two doors for ease of loading)
- Four doors ensuring rapid and unrestricted passenger access
- Wide access into cabin for freight
- Large windows giving all-round visibility

Sikorsky S76A+
Seating/Cargo Layouts

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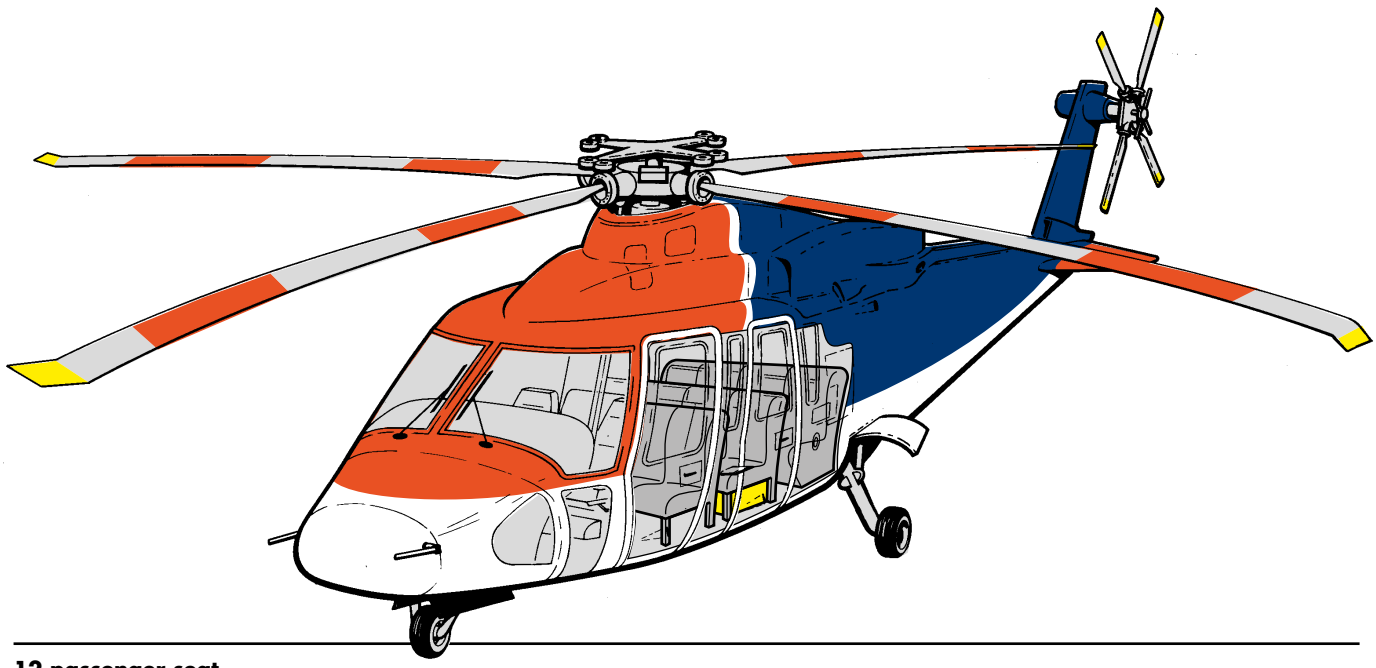
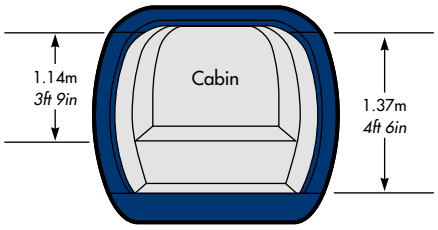
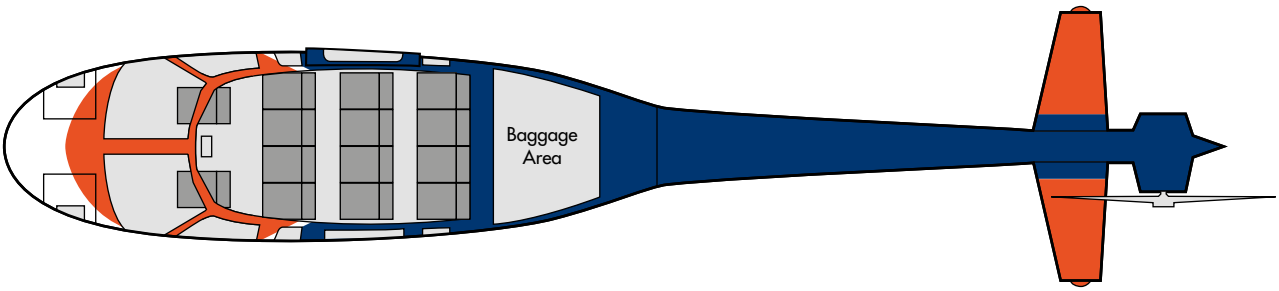
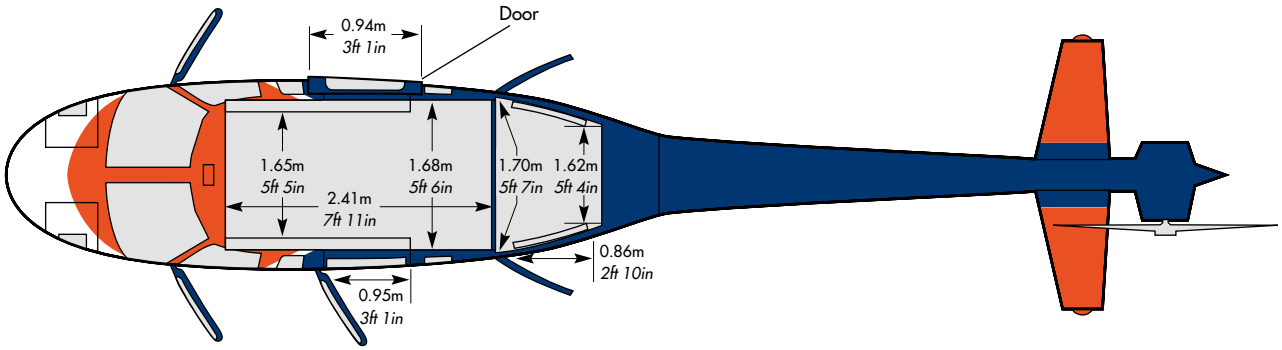


12 passenger seat configuration





Cargo configuration
Baggage area
1.33m³/47ft 2in³



HLO HELICOPTER LANDING OFFICER

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RelyOn Nutec
360° Safety

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