OFFSHORE NORGE

074 – Offshore Norge Recommended Guidelines - Helideck Manual

Translation from Norwegian

FOREWORD

These guidelines are recommended by the Offshore Norge Aviation Forum and Offshore Norge Operations Committee. They are also approved by the Director General.

The responsible manager in Offshore Norge is the Technical Director, who can be contacted via the Offshore Norge switchboard at +47 51 84 65 00.

These guidelines have been prepared in cooperation with the helicopter operators on the Norwegian continental shelf - Bristow Norway AS and CHC Helikopter Service AS, and Lufttransport RW AS - and are owned by Offshore Norge.

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1 INTRODUCTION

1.1 Purpose

The purpose of these guidelines is to ensure uniform and standardised operation of the helicopter deck (helideck) and to ensure the safety of helicopter operations on the helideck. They should be used by both helideck operators and helicopter operators. The guidelines have been developed to ensure conformity with laws, regulations, standards and other guidelines that are relevant for helideck operations.

The guidelines specify responsibilities for managing the helideck, operations on the helideck, and requirements for helideck crew and equipment - including the refuelling plant.

The guidelines are applicable for fixed and mobile facilities as well as offshore service vessels used in petroleum operations on the Norwegian continental shelf (NCS).

1.2 Management system and responsibilities

The helideck operator is responsible for:

- Ensuring conformity with the requirements in Section 5 concerning the management system in the Norwegian regulations relating to helicopter operations - use of offshore helidecks (BSL D 5-1).
- Ensuring conformity with the requirements in Section 7 concerning helideck data in the Norwegian regulations relating to helicopter operations - use of offshore helidecks (BSL D 5-1).
- Incorporating helideck management and helideck operations in an established management system to ensure that these guidelines and regulatory requirements are observed.
- Ensuring that technical installations on the helideck, radio/communication, navigation and meteorological equipment and refuelling plant comply with the applicable regulations.
- Ensuring that the HLO, helideck crew, radio operator/communication officer and relevant personnel are competent and conform with applicable regulations.

The helicopter operator has an independent responsibility to only use helidecks which they find to be suitable for use and which, as a minimum, conform with the requirements in BSL D 5-1.

1.3 Definitions and abbreviations

AFIS	Aerodrome Flight Information Service
ATC	Air Traffic Control
ATS	Air Traffic Services
BSL	Regulations for civil aviation
EASA	European Union Aviation Safety Agency

Helideck operator	Responsible owner and operator of the helideck on fixed installations, mobile units or vessels
HLO	Helicopter Landing Officer
HMS	Helideck Monitoring System
IATA	International Air Transport Association
MRU	Motion Reference Unit
Manifest	Official document which states the names of the passengers, their employers, the weight of passengers, luggage and cargo, as well as the destination
Night conditions	When the sun is more than six degrees below the horizon
NOTOC	Notification to Captain
Safedeck	A helideck designed with surface drainage which prevents fuel accumulation by allowing it to drain away, thereby preventing it from feeding a possible fire in the enclosed piping system under the deck
XBR	Extra Broad Shoulders

1.4 References

Norwegian Ocean Industry Authority (Havtil)
Sections 73-77 in Chapter XIII (Emergency preparedness) of the Activities Regulations.
Section 70 of the Facilities Regulations.
Sections 29, 30 and 31 of the Management Regulations

Civil Aviation Authority - Norway (CAA-N)
BSL A 1-3 Regulations relating to reporting obligations concerning aviation
BSL D 1-1 Regulations relating to aviation operations
BSL D 2-3 Regulations relating to offshore helicopter operations
BSL D 5-1 Regulations relating to helicopter operations – use of offshore helidecks
BSL G 1-3 Regulations relating to requirements for air traffic services and providers of air traffic management and air navigation services (ATM/ANS), etc.
BSL G 7-1 Regulations relating to the aeronautical meteorological service on the NCS

Norwegian Maritime Authority (NMA)
Regulations relating to helidecks on mobile offshore units, FOR-2021-03-18-815

EASA
EASA OPS ORO.GEN.110(j) and SPA.DG.105(a) with AMC and GM

Offshore Norge
Offshore Norge guidelines - 002 – Recommended guidelines for safety and emergency preparedness training. These guidelines describe training requirements for helideck personnel.

2 HELIDECK MANAGEMENT

2.1 Approval of mobile and fixed facilities

The facility's helideck and refuelling plant shall be approved by the relevant government regulators and the relevant helicopter operator before it can be used on the NCS. As regards fixed facilities, the relevant authorities will be Havtil with assistance from the CAA-N.
Where mobile units are concerned, they will be the flag state, or alternatively, the NMA with assistance from the CAA-N. See Chapter 3 of the Helideck Manual.

2.2 Inspection and supervision

The helideck operator is responsible for ensuring that maintenance as well as routine inspection of the helideck and refuelling plant are carried out. Inspections shall be documented.

The helideck operator shall conduct periodic inspections. Havtil, with technical support from the CAA-N, can conduct audits of the operator's system/facility on its own initiative.

2.3 Maintenance programme

A maintenance programme for the helideck with equipment and refuelling plant shall be established and implemented.

2.4 Recommended practice for helideck management

A need to establish a best practice for helideck management has been identified through the Committee for helicopter safety on the NCS (SF). Its purpose is to help ensure that the helideck complies with regulatory requirements, that it is operated prudently, that relevant procedures are established, and to safeguard interaction with the helicopter company and the helicopter crew.

The following areas are considered to be of particular importance in ensuring sound helideck management by the helideck operator:

a. Ensuring compliance with the regulations. Failing to ensure compliance with relevant laws and regulations may have significant consequences both as regards reducing the level of safety and the costs of addressing nonconformities. Imposing operational restrictions on using the helideck as a mitigating safety measure could also have substantial consequences for operation and cost. The helideck operator should therefore ensure that aviation-related technical clarifications are safeguarded during planning, design and implementation phases, including the following:
    i. new facilities equipped with a helideck
    ii. modifications during the facility’s operational life
    iii. shutdown and removal of the facility

The company's technical aviation adviser should be involved to advise the helideck operator during these processes in order to ensure conformity with the regulations/other relevant requirements.

b. Ensure that management of the helideck and helideck operations are integrated in the helideck operator's management system, which includes following up and closing helideck nonconformities.

c. Ensuring that the helideck operator has access to competent and experienced technical personnel who can advise on operations and decisions related to the helideck and helicopter operations.

d. Following up incidents, participating in investigations and contributing to continuous improvement related to the helideck.

e. Ensuring that incidents are reported to the authorities and regulatory bodies in accordance with these guidelines.

f. BSL D 5-1 deals with the helideck as a system, while the helideck owner breaks it down into technical disciplines. Fragmentation of responsibility should be avoided.

g. The helideck operator should have a system in place to ensure that experience is transferred between the various facilities.

h. Where use of a third-party helideck is planned, the contracting company shall ensure that the helideck and its personnel satisfy applicable requirements on the NCS, including familiarity with and use of these guidelines.

i. The helideck operator shall have an internal quality assurance process for managing the helideck, including operational factors.

j. Applications for exemptions which relate to the provisions of BLS D 5-1 shall generally follow a parallel course, where the helideck operator together with the helicopter operator conduct risk assessments of the relevant circumstances, and where harmonised applications are submitted by the helicopter operator to the CAA-N and by the helideck operator to Havtil. Havtil will seek technical assistance from the CAA-N.

3 HELIDECK CREW - TRAINING AND DUTIES

3.1 Training of helideck crew

Helideck crew shall have documented training prescribed in Offshore Norge 002 - Recommended guidelines for safety and emergency preparedness training.

Training provided pursuant to these guidelines shall be considered together with the training and drills conducted by the helicopter owner, operator or employer. Detailed requirements for implementing the training and drills follow from Section 23 of the Activities Regulations.

Training materials for helideck personnel are available on the Offshore Norge website.

3.2 Competence and experience

The table below presents requirements for the courses and work experience required to carry out tasks in connection with helicopter operations.

Ref.	Role	Typical tasks	Course requirements	Experience required	Comment
R1.1	Heliguard and fireguard.		Valid HLO basic or refresher course (see Guidelines 002)	Shall have participated in at least 20 helicopter landings and take-offs under the guidance of an experienced HLO before becoming fully qualified for independent duty. If the level of flight activity on the helideck is low, and achieving 20 landings/take-offs is difficult, arrangements should be made for training on a deck with greater activity.	Personnel with such training but who have not served in these positions over the past two years, or who are unfamiliar with the facility, shall be given a practical review of the relevant helideck and refuelling plant under the guidance of an experienced HLO.
R1.2	HLO		Valid HLO basic or refresher course (see Guidelines 002)	Served regularly as a qualified heliguard / fireguard for at least one year.	Personnel with such training but who have not served in these posts over the past two years, or who are unfamiliar with the facility, shall be given a practical review of the relevant helideck and refuelling plant under the guidance of an experienced HLO.

R1.3	Trainee		Valid HLO basic or refresher course (see Guidelines 002)	No requirements	A trainee supplements the normal helideck crew. On certain facilities and vessels involved in petroleum operations, both the number of crew on board and the frequency of helicopter landings and take-offs will be so low that it would be impossible in practice to achieve a sufficient number of landings/take-offs over a reasonable period (one year) to qualify a complete helideck crew. Where such facilities/conditions are concerned, it will be acceptable for one of the three members of the helideck crew to serve as a trainee - providing that the person concerned, after completing an HLO course, takes a one-day practical course in landing/take-off at a heliport under professional guidance.
	Administrative tasks in connection with helicopter operations	Planning routes and responsibility for passenger and cargo manifest. Responsibility for showing the correct safety video prior to departure Verifying luggage weight and/or check-in kiosk. Filling out NOTOC	Documented training and familiarity with ON 074, as well as the company's internal procedures IATA DGR Awareness		
	Passenger, luggage and cargo handler	Involved in receiving, loading and offloading cargo, as well as filling out manifests.	IATA DGR Awareness		e.g. receptionist, or others who receive and record cargo on manifest
	Dangerous goods specialist	Filling out NOTOC	IATA Helicopter, Basic		Personnel with this competence will not normally be on board
	Radio operator, Log info	Info for pilot – weather, routing and return cargo - printing out and forwarding TAF/METAR for pilot	Documented training and familiarity with ON 074, as well as the company's internal procedures		

		Monitoring relevant weather conditions, conditions on board and any HMS data Issues helideck report	IATA DGR Awareness Competence in logging and communicating weather data Competence within aviation phraseology and familiarity with ATC/ATS		
	HLO	Informs the pilots when the deck is ready and any operative updates for the pilots.	Competence in logging and communicating weather data Competence within aviation phraseology and familiarity with ATC/ATS		HLO course

Comment:
Concerning R1.1, R1.2 and R1.3: Personnel who have not served in the role or who have courses more than 5 years old shall complete a new basic course and follow the curriculum for those who are new in the role; see Offshore Norge Guidelines 002 - Previous knowledge requirements for HLO rep courses.

3.2.1 Competence requirements for weather observation

Task	Course requirements	Comment
Issuing METAR	Approved METAR course	See BSL-G 7-1
AUTOMETAR		Solution approved by CAA-N. E.g. typically AUTOMETAR verification by the Norwegian Meteorological Institute or equivalent
Responsibility for weather information on helideck report	Approved course for "Weather observation associated with helideck report"	
Weather updates	Approved course for "Weather observation associated with helideck report"	Info for pilot provided about 20 min before arrival along with Log information.
Changes in weather conditions - Monitoring weather and wind conditions while a helicopter is on the helideck	Approved course for "Weather observation associated with helideck report"	Overlaps with personnel who also monitor changes in movement and heading
Weather updates in information to the pilots to signal that the deck is ready	HLO course	

3.2.2 Competence requirements within communication

Communicating logistics and/or weather information to pilot	On-the-job training	

3.3 Physical suitability

Helideck crew shall be able to respond immediately in the event of a helicopter accident until dedicated response personnel are in place. The helideck operator is responsible for ensuring that helideck crew are physically and mentally suited for their role. Members of the helideck crew shall have documented familiarity with the use of smoke-diving equipment.

3.4 Responsibilities and duties of the HLO

The HLO is responsible for day-to-day management of work on the helideck during helicopter arrivals and departures, and for keeping the offshore installation manager (OIM) informed in writing at regular intervals about the status of the helideck, and its equipment and services. This includes ensuring that:

- necessary measures are taken to prevent unauthorised personnel from entering the helideck before take-offs and landings
- the helideck and areas surrounding the helideck have been cleared of loose objects, snow and ice, flammable substances, etc.
- necessary personnel are in place, wearing correct clothing and standing by.
- the helideck crew is informed about special conditions before a helicopter arrives, the helicopter's specific door and cargo compartment configuration, and for special operations. This is particularly important when an unfamiliar helicopter type is involved.
- all equipment and instruments are in place and in working order.
- all crane operations near the landing area have been suspended, and the cranes correctly oriented to ensure unobstructed approach and departure sectors. Details about lights in 4.1.7.
- manually activate red status lights if it becomes necessary to close the helideck, providing the facility has such lighting.
- status/repeater lights are dimmed upon request from the pilot, if the lights are blinding.
- passengers stay in the safe zone during landing and take-off and receive guidance during disembarkation and boarding. See Appendix B, "Helicopter danger zones", which describes safe zones for the various helicopter types.
- cargo in the cargo compartment does not exceed weight limits for the helicopter in question.
- passengers have put their survival suits on correctly.
- the number of passengers is in accordance with the manifest.
- all pax (passengers) marked XBR in the manifest are wearing XBR bands and that the XBR procedure is followed.
- the passengers have fastened their seat belts.

- before take-off, there are no loose objects either inside or outside the helicopter, or in the vicinity of the helideck.
- there are no traces of leaks or loose objects on the deck that could have come from the helicopter after take-off.
- Information on helideck operations is included in the handover to the next shift.

Before landing, the HLO shall maintain contact with the helicopter pilots and inform them whether the deck is cleared for landing. See Appendix D, "Phraseology".
The HLO shall immediately report all nonconformities on the helideck to their immediate supervisor and the OIM and also ensure that the helicopter operator is informed.

The HLO shall position themselves so that they have the best possible vantage point for observing landing/take-off, and shall closely monitor these operations. They shall immediately inform the pilot by radio or visual signals if any abnormal conditions are noted or if conditions arise which require the helideck to be closed. For example, this could be gas leaks or other hazards. The pilots shall be notified immediately via radio or hand signals, both when approaching and when the helicopter is on the deck, if such conditions arise. The threshold for radio use should be low, and should not strictly require correct phraseology or language. Nevertheless, warnings should primarily be given in English if this can be done without loss of time.

3.5 Clothing and personal protective equipment for helideck crew

Every member of the helideck crew during take-off and landing shall have immediate access to a set of gear which conforms with or exceeds the following European norms (EN):

EN 469	Protective clothing for firefighters (must also fulfil requirements Xf2, Y2 and Z2)
EN 659	Protective gloves for firefighters
EN 443	Helmets for fire fighting
EN 15090	Footwear for firefighters (alternatively EN 354 or EN 345)
EN ISO 14116	Protective clothing — Protection against flame [balaclava] (alternatively EN 11612 or EN 533)
EN 137	Respiratory protective devices [smoke diving equipment] (minimum of three (3) sets for distribution)

When this gear is not in use, it shall be stored in a dedicated locker, ready to be donned rapidly, in the immediate vicinity of the helideck. This locker or the nearest door(s) shall be red in colour and labelled "Brannbeskyttelse" and “Fire protection”.

In addition to the necessary number of fire protection sets, the locker shall contain the following:

- At least two lifelines with a minimum length of 30 metres
- Two fire blankets

On helidecks without remotely operated extinguishing systems, the helideck crew

member stationed by the foam monitor shall wear all the fire protection gear listed above, with the exception of smoke-diving equipment.

Fire protection gear shall be worn by all members of the helideck crew during take-off and landing when it is reasonable to believe that a hazard could potentially arise on the helideck. During refuelling, the fire guard shall wear the fire protection gear listed above, with the exception of smoke-diving equipment.

General requirements for clothing and equipment:

Coveralls/jacket and trousers	EN ISO 11612 Protective clothing
Rainwear	EN ISO 14116 Protective clothing
Outermost item of clothing	ISO 20471 Hi-vis protective clothing
Safety shoes	ISO 20345 Minimum class S2
Hearing protectors	EN 352 Hearing protectors
Gloves	EN 388 Protective gloves against mechanical risks
Eye protectors	EN 166 Personal eye protection

Outerwear for HLOs shall be labelled HLO on the back and the chest. Alternatively, labelled arm bands can be used. This is to ensure that the HLO can be easily identified by the helicopter crew.

3.6 Staffing the helideck

The helideck shall normally be staffed by at least three people. These personnel are collectively called the helideck crew:

- HLO
- Heliguard
- Fireguard

The HLO is the senior position in relation to the heliguard and fireguard.

The helideck operator shall have a system to retroactively trace who is serving as the HLO at any given time. This is intended to ensure traceability for each landing and take-off.

The fireguard operates the fire extinguishing equipment on the helideck and works with the heliguard to offload and load the helicopter's passengers and cargo. As and when required, the fireguard can assist the heliguard in connecting and disconnecting fuel hoses.

The heliguard is responsible for offloading and loading the helicopter's passengers and cargo and also supports the fireguard and HLO during emergencies.

During take-off and landing, at least one person wearing a fire protection suit shall be posted at the remote-control unit for the helideck's fire extinguishing systems. If it is not possible to use the remote-control unit, one person shall be posted by the helideck foam monitor that will be most appropriate to use under the relevant weather conditions. This person should be wearing all fire protection gear listed in Chapter 3.5, with the exception of smoke-diving equipment.

During refuelling with the engine running, the helideck crew shall include the following roles (see also Chapter 6.11 and Appendix J):

- Operator of the refuelling plant
- Operator of the pistol grip nozzle
- Fireguard.

The HLO can be one of these three. The fireguard shall be clothed as described for take-off and landing.

Under exceptional circumstances, extra personnel without a training course and/or experience can be used if required on the helideck. They shall be briefed by the HLO and supervised by a member of the helideck crew throughout all helicopter operations.

Satisfactory staffing during emergency situations shall be described in the facility's emergency preparedness procedure.

3.7 Helideck report

- The issuer of the helideck report shall acquire an overview of any restrictions that are relevant for the helicopter operation on the facility, such as wind sector and wind strength restrictions.
- No later than one hour before the helicopter is due to depart from shore, the facility shall provide the helicopter operator with updated information on the helideck status and flying conditions.
- This shall be provided on the dedicated report format. Helideck Report
  A different form can be used if the helideck operator and helicopter operator agree and accept this.
  - The report is valid for up to six hours, so a new report will not be necessary if the information does not change.
  - The helideck report shall be sent as an e-mail attachment in PDF format.
- The e-mail shall include the following in the subject field:
  <Facility name, ”Helideck Report” Date, Flight number>
  This shall be the only text in the subject field.
- The flight number is only included if the report is valid for a specific flight or if the logistical data fields in the report have been completed.
  Example:
  ”Troll A, Helideck Report 13.08.10”
  or "Åsgård B, Helideck Report 13.08.10, HKS477”

Note the following for facilities with a moving helideck:

- the HLO/radio operator shall be able to verify that the Helideck Monitoring System (HMS) conforms with the applicable version specified in Appendix K.
- a screenshot of the HMS image shall be submitted along with the helideck report.

- The HLO/Radio Operator shall be familiar with where they can read data from the Motion Reference Unit (MRU). (Helideck movement values shall only be filled out if the HSM is out of service (read directly from MRU)).

The completed form shall be sent to the relevant helicopter operator using the following e-mail addresses:

- Bristow Norway: helideck.norway@bristowgroup.com
- CHC Helikopter Service: helideck@chcheli.com & customer@chcheli.com
- Lufttransport RW AS: helideck@lufttransport.no

These addresses are only used for submitting helideck reports, and no response will be given to other inquiries.

Red boxes are mandatory

HELIDECK REPORT

INSTALLATION:			
TEL:			
DATE:	TIME (UTC):	EMAIL:	
POSITION:			VHF RIG: mHz
DYNAMIC POSITIONING:	☐ YES ☐ NO		VHF LOG: mHz
ACCURATE MONITORING EQUIPMENT:	☐ YES ☐ NO		NDB: kHz

HELIDECK INFORMATION

HELIFUEL AVAILABLE: ☐ YES ☐ NO	FUEL QUANTITY AVAILABLE:	LTRS
HELIDECK HEIGHT: FT	HELIDECK HDG: °	VESSEL HDG: °

LOG INFORMATION

FLIGHT NR:	LOG NOTES:
NUMBER OF PAX: 0	
PAX WEIGHT: LE	
LUGGAGE: LE	
CARGO: LE	
TOTAL WEIGHT: 0 LE	

ROUTING

1.	2.	3.	4.	5.	6.

WEATHER OBSERVATION

WIND (10 MIN MEASUREMENT)

WIND (10 MIN)	DIRECTION	SPEED	MAX (10 min)		
HELIDECK	°	KTS	KTS	VISIBILLITY:	M
AREA	°	KTS	KTS	TEMP:	°C
				DEW POINT:	°C
CLOUD LAYER 1: CAVC /	FT			QNH:	hPa
CLOUD LAYER 2: N/A /	FT				
CLOUD LAYER 3: N/A /	FT				

Other relevant info (fog banks, sea spray etc):

HELIDECK MOVEMENTS (HMS) – 20 MIN INTERVAL

MAX PITCH & ROLL WITH REFERENCE TO HORIZON		INSTALLATION CATEGORY:	
PITCH	ROLL	MAX HEAVE:	M
UP: ° DWN: °	PORT: ° STBD: °	HEAVE PERIOD:	seconds
MAX INCLINATION: °		SIG HEAVE RATE:	meters/sec

The helideck is inspected according to Norwegian Oil & Gas Helideck Manual (NOG074). Non-conformities will appear under Remarks.

Remarks (including known obstacles/vessels within 10nm):

NAME OF HLO:

Send form to respective helicopter operator helideck.norway@bristowgroup.com /helideck@lufttransport.no /
helideck@chcheli.com & customer@chcheli.com ON ver. 3.7 SNO

3.7.1 Filling in the form

The form is self-explanatory, but additional information will pop up when the cursor is placed over an editable field. Further explanation on individual items is provided below:

Dynamic positioning
Check "YES" or "NO" to indicate if the vessel is dynamically positioned (DP).
If the DP system is active: ”YES”.
DP inactive: NO.

Accurate monitoring equipment (HMS)
Check "YES" or "NO" to indicate whether the facility/vessel has an operational HMS.
If the helideck moves (i.e., not a fixed/tension-leg platform) and the HMS is operative: “YES”.
If the HMS is not operational or the helideck is fixed (i.e., a fixed/tension-leg platform): “NO”.

Helideck information
Fuel quantity available
Enter the total number of litres available for delivery to helicopters, including all fully settled tanks.

Log info
Logistical data shall be entered unless this is reported differently according to local procedures.

Logistical data should be entered as accurately as possible, even if the return cargo is not fully known when the form is submitted, in order to give the pilots the best possible basis for planning the flight. The information will then be updated on arrival.

If several destinations are involved, proposed routes should be entered in the ROUTING fields along with passenger exchange (pax on/off); for example: **1: XXA -8 /+9, 2: XXB -9 /+11**.

NOTE: Updated information on relevant weather conditions, helideck movement and log info (i.e., return cargo) for the facility shall be provided to the helicopter on initial radio contact. See also Appendix H, "Radio communication".

Helideck nonconformities
All nonconformities on the helideck and associated with helideck operations shall be entered on the form.

Examples: Ships within the 500-metre zone, equipment nonconformities on the helideck, temporary objects in the obstacle-free zones, deviations from standard helideck procedures, gas flaring, and other information which could be considered significant for the pilots.

Weather observation
All weather information fields shall be completed, but with some exceptions according

to local procedures.

- If the facility is covered by a local METAR service, "see METAR" can be entered in the cloud base field.

Wind
Anemometer positions are specified as the height and distance in metres relative to the edge of the helideck.

Wind direction shall be recorded in degrees relative to magnetic north, and wind speed shall be reported in knots for mean wind. Wind information from the area wind sensor shall generally be provided to pilots unsolicited. Wind information from the sensor near the helideck shall only be provided to pilots upon request.

Max wind of 60 knots or more shall always be recorded.

If the wind speed is less than 1 knot, the wind shall be recorded as CALM.

Wind variation shall be entered according to the following rules:

- Wind that varies by more than 60 degrees, but less than 180 degrees, with a wind strength of less than 3 knots, shall be listed as VARIABLE.
- **2-minute wind**: Wind recorded in connection with landing and take-off.
- **10-minute wind**: Wind reported in the Helideck Report / METAR.
- **Instant wind**: Wind recorded when the pilot requests a "wind check" in their final transmission or just before take-off. This shall include min/max wind if gust cannot be used. Example: Wind 340 degrees, 41 knots, maximum 50 knots.

Reference: MET.TR.205 Reporting of meteorological elements, ICAO Annex 3, Appendix 3.

Other relevant information
Enter other relevant information on weather conditions, such as fog banks, variable winds, rain or snow, thunder and lightning, varying visibility in different directions, etc.

Sea spray observed over the helideck
Check "YES" or "NO" to indicate whether sea spray has been observed over the helideck in the prevailing weather conditions.

HELIDECK MOVEMENT (English only)
Max pitch UP/DOWN with reference to horizon:
The largest pitch movement up/down over the last 20 minutes measured in degrees with reference to the horizon.

Max roll Starboard/Port with reference to horizon:
The largest roll movement starboard/port, over the last 20 minutes, measured in degrees with reference to the horizon.

Max Helideck Inclination:
The largest measured helideck inclination, over the last 20 minutes, measured in degrees with reference to the horizon.

Max heave (top to bottom):
The maximum heave (total vertical movement) of the helideck is the maximum top to bottom value in one cycle (one movement curve) over the past 20 minutes.

Heave period:
The time in seconds between tops of two waves. If measurement equipment is not available, the pilots will use a standard heave period of 10 seconds for manual calculations of average heave rate.

Significant Heave rate: vertical movement rate of the helideck in meters per second.

Remarks:
All relevant factors that could affect helicopter operations.

3.8 Helideck Monitoring System

Moving helideck
The helicopter companies and the CAA-N require facilities and vessels with moving decks to carry equipment able to measure pitch, roll, inclination and heave rate at the helideck.

Measuring equipment for moving decks (HMS)
The helicopter companies have developed a standard which specifies the minimum requirements for the necessary measuring equipment in order to carry out helicopter operations to and from a moving helideck.
See appendix K, "Standard Helideck Monitoring System".

Red flashing (repeater) lights around the helideck shall be activated automatically when specified limits for motion are exceeded, exactly like red traffic lights presented on the HMS screen.

3.9 Notifying and reporting incidents in helideck operations

The HLO on behalf of the helideck operator is responsible for reporting incidents during helideck operations. An overview of the regulatory reporting requirements is provided below, but it is recommended that the HLO use the report form in this manual (Appendix L) and sends it, as agreed within their own company, either directly to the helicopter operator's operations centre or to the technical aviation adviser in their own company, who can assist in forwarding the form, as well as further reporting to the CAA-N/Havtil as required. This can either be combined with reporting in their own company's reporting system for HSE incidents, or serve as a supplement to this.

Pursuant to Norwegian aviation, maritime and petroleum legislation, the HLO and helideck crew are responsible for reporting incidents on the helideck and in connection with landing and take-off. Internal reporting is handled through the helideck operator's incident system. The aerodrome flight information service (AFIS) offshore can initiate notification in accordance with local procedures. The helideck operator shall register reports, assess criticality, and if necessary, notify and report to the relevant regulator and government agency. Pursuant to the reporting requirements, the latter are the CAA-N, Havtil and the NMA. Notification and reporting can be done by the HSE department, operating department, or authority relations contact acting on behalf of the helideck operator.

The CAA-N requires electronic reporting via the ECCAIRS 2 portal at aviationreporting.eu, and also requires that reports are submitted within 72 hours. Possible further notification to the Norwegian Safety Investigation Authority is handled by the CAA-N.

Pursuant to BSL A 1-3 and Sections 5 and 9 of BSL-D 5-1, the helideck operator is responsible for reporting aviation accidents, serious aviation incidents, serious technical faults, incidents with dangerous goods in aircraft, and collisions between aircraft and birds to the CAA-N.

The Reporting Regulation (EU) 376/2014 specifies which incidents qualify for mandatory (Article 4) or voluntary (Article 5) reporting. See also Sections 1-2 (1) and 12-10 of the Norwegian Aviation Act, and the detailed list in Annex IV to Implementing Regulation (EU) 2015/1018, cf. Section 2 of BSL A 1-3.

Examples of reportable incidents are provided in the Guidelines for BSL D 5-1.

The helideck operator is responsible for notification and reporting hazard and accident situations, providing information about follow-up of hazard and accident situations, and reporting accidents which have resulted in fatalities or personal injuries pursuant to Sections 29, 30 and 31 of Havtil's Management Regulations.

Pursuant to Section 9 of BSL D 5-1, relevant helideck incidents shall be reported by the helideck operator to the helicopter operator involved if the incident involves their helicopter.
Appendix L to the Helideck Manual can be used for this purpose. The report form shall be filled out by the helideck crew and sent to the helicopter operator from the helideck operator. The intent here is to ensure learning, and improvement of aviation safety.

The helicopter operator has a corresponding duty to notify the CAA-N about registering and handling of all incidents on the helideck if its helicopters have been involved.

Individual workers can report directly through ECCAIRS 2 to the CAA-N if particular circumstances make this appropriate.

4 HELIDECK AND EQUIPMENT

This chapter is informative in nature and describes the following:

- The helideck in general.
- Equipment components and guidelines on helicopter safety in the context of the regulations.

The authorities set minimum standards for helidecks, equipment and personnel.

The following sections are primarily excerpts of the key provisions. Chapter 1.4 contains a list of references.

4.1 The helideck in general

4.1.1 Obstacles in departure and approach sectors

No obstacles rising above the level of the helideck are permitted on or in the immediate vicinity of the deck in the 210° departure and approach sectors, with the following exceptions:

- The safety curb.
- Perimeter lighting and floodlights as well as status and repeater lights rising no more than 25 centimetres above the level of the helideck.
- Outer edge of the safety net.
- Individual obstacles necessary for deck operation (foam monitors, signs) rising no more than 25 centimetres above the level of the helideck.
- Alternative lighting up to 25 millimetres in height.

4.1.2 180° obstacle-free sector

In connection with approach and departure, the person responsible for the helideck shall ensure that there are no vessels, floating structures or other types of obstructions close to the sea surface within a 180° sector out to a minimum distance of 500 metres from the helideck. If this sector cannot be made obstacle-free, this information shall be included in the Helideck Report and reported via radio prior to arrival, so that the helicopter crew can make their assessments.

4.1.3 Non-skid protection

The helideck shall have a non-skid surface which prevents the helicopter from skidding. Non-skid protection shall be adequate in relation to the prevailing weather conditions and the helicopter type in use, and shall comply with the applicable regulations.

4.1.4 Landing net

The helideck shall be equipped with a landing net.
Its size will be determined by the largest helicopter used.
This net is normally dimensioned for a large helicopter, with a minimum size of 15x15 metres. The net mesh shall be sized to avoid snagging the helicopter's landing gear.

The net shall be fastened at 1.5-metre intervals. To ensure that it is kept sufficiently taut, at least 50 per cent of the attachment points shall have a tightening mechanism. The net shall be taut enough to ensure that it cannot be lifted more than 25 centimetres from the underlying surface. The attachment points shall have a torque corresponding to about 200-250 kg of tension.

The guy lines attaching the net shall be included in the daily check of the helideck before helicopter operations on days when flights are expected.
A particularly careful check shall be made for wear on the underside of the attachment points for the guy ropes on the net and the helideck.

The landing net and guy lines shall not be used beyond the manufacturer's recommended lifetime.

A net is not required on facilities where the helideck surface consists of individual profiles with special non-skid properties.

A landing net is not required on non-moving helidecks if the deck is suitably designed and if a system is in place to prevent the helicopter from skidding. The landing net requirement is absolute if snow and ice are present on the helideck. See the guidelines to the regulations for further stipulations.

4.1.5 Visual aids

The term visual aids covers windsocks, markings and helideck lighting.

A 2.4-metre windsock is preferred over the smallest 1.2-metre version, since visibility from the air is marginal and worsened by bad weather and night darkness.

4.1.6 Windsock

A windsock shall be:

- Clearly visible.
- Mounted in a location subject to minimum turbulence from surrounding structures.
- Monochrome (orange) or dual coloured: orange/white, red/white or black/white.
- In a cone shape and adequately sized. (Standard size: inner diameter 60 cm, outer diameter 30 cm, length 2.4 m).
- Illuminated for night flying.

4.1.7 Identification

The helideck shall be marked with the name of the facility, clearly visible from all approaches above the level of the helideck.

4.1.8 Lighting

Helidecks that will be used for night flying and/or under reduced visibility conditions, shall meet the following requirements:

- Adequately shielded floodlighting to prevent pilots from being blinded during the approach and landing phase. The floodlights shall only be used at the pilot's request and shall be switched off before arrivals and departures to prevent the pilot from being blinded. The light can be switched on after landing to provide adequate working light for the helideck crew when the helicopter is on the deck.
- Marked with perimeter lighting consisting of green lights equally spaced at intervals not exceeding three metres.
- Perimeter lighting that is not visible below the deck level. Lights shall not rise more than 25 cm above the deck level. Floodlighting and perimeter lighting shall be connected to the facility's emergency power supply and switchover time in the event of mains power failure shall not exceed 10 seconds.
- The highest point on the derrick, crane booms/cabins or other obstacles which represent an aviation obstacle shall be marked with red warning lights which are visible from all positions*. Alternatively, the obstacles can be floodlit. Pay special attention to ensuring adequate illumination of the flare boom from all sides, particularly if its flame is extinguished or small.
- Derricks and booms shall also be fitted with red lights positioned at levels corresponding to each third of their total length/height, measured from their highest point.
- At least one light at each level shall be visible from all directions.

* Pay special attention to ensuring that cranes which have been temporarily parked do not extend over the facility's reported highest point (information on the aerodrome datasheet)

4.1.9 Operating equipment

The helideck shall at all times have a full complement of the equipment required for its operation, including:

- Chocks for placing in front and behind of the main wheels on both sides of the helicopter (weight and size, e.g., 8 kg, with minimum size H: 12.5 cm W: 14cm L: 30 cm).
- Easily accessible slings to tie down a parked helicopter.
  (At least 6 slings with a capacity of 5 tonnes).
- De-icing and snow clearing equipment.
- Scale for weighing luggage/cargo placed on a stable surface.

Scale calibration:
We recommend using a 10 kg weight as a standard to calibrate the scales.
Each calibration shall be carried out using the same calibration weight:

- The tolerance during calibration shall be +/- 0.3 kg. The manufacturer shall be contacted for anything beyond this, and the scales shall not be used until recommended measures are implemented.
- Suitable scales on moving facilities which ensure accuracy in motion.

- The scales shall be calibrated at least once a month, and this shall be logged in an appropriate document management system.

4.1.10 Fire and rescue equipment

The following rescue equipment shall be available in the immediate vicinity of the helideck:

- Two fire axes.
- Three stainless steel knives (for cutting seat belts).
- Two hand torches/flashlights (explosion-proof).
- One crowbar.
- One wire cutter.
- One hacksaw with spare blades.
- One hammer.
- One safety crash bar
- One set of sheet metal shears.
- One set of bolt cutters.
- One jack with a minimum lift of 0.5 tonnes.

This equipment shall be stored in an easily accessible manner, visible and in a safe place, preferably a sealed locker or chest. If the locker or chest can be locked, the key shall be placed behind a breakable window. The locker or chest shall be red in colour and labelled “Nødutstyr" and “Emergency equipment”.

The following shall be kept in a suitable place close to the emergency equipment locker/chest:

- One metal hook with a metal shaft about three metres long.
- A lightweight ladder about three metres long.

4.1.11 Communication equipment

Personnel forming the helideck’s minimum staffing shall at all times be equipped with portable VHF radios able to communicate with the helicopter crew and radio operators on the facility.

4.1.12 Signage

Clearly visible signs shall be posted along access routes to the helideck which prohibit:

- Standing on the deck during landing and take-off.
- Moving behind helicopters parked on the helideck with their rotors engaged.

Stairs leading down from the helideck shall be clearly marked "EXIT". This text shall be visible in the dark.

4.1.13 Helideck closed marker

Normally, a helicopter cannot land until it receives a “deck cleared" message from the HLO. But this could nevertheless happen in emergencies or due to a misunderstanding. The assumption is therefore that a helideck not marked as closed can be landed on

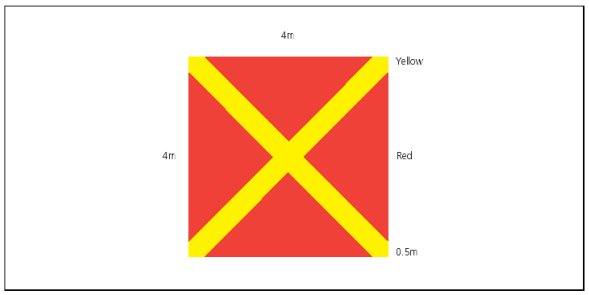
without risk to the helicopter or personnel on the ground. In order to prevent such risk, the helideck shall be marked as closed if a landing could have unacceptable consequences.

This marker shall be used if:

- Landing on the deck would be hazardous, for example due to work in progress involving loose objects, structural weaknesses, obstacles such as wires stretched over the landing area and so forth. Please note that this does not normally apply during crane operations, as the crane will be clearly visible to the pilots.
- Landing would represent a hazard to personnel working, present on or close to the helideck.
- Another facility with a helideck is docked alongside, such as a flotel or drilling rig, and only one of the helidecks is in use.

PLEASE NOTE: The marker shall not be displayed merely because the helideck is unstaffed or due to general equipment faults and downtime.

A temporarily or permanently closed helideck shall be marked according to internationally accepted standards, with a diagonal yellow cross on a red background. This shall be painted on the deck or on canvas which can be laid out and secured. The marker shall be positioned over the H at the centre of the helideck.



When the helideck is marked as closed, the green perimeter lights shall be turned off. Even AMB/SAR helicopters will refrain from landing when the helideck is marked as closed, unless otherwise agreed.

4.2 Safety equipment

This section provides a general description of safety equipment available on the facilities. The type of equipment can vary from facility to facility. Specific information on the equipment found on a particular facility is provided in the local operational manuals.

4.2.1 Alarm system

It shall be possible to activate the alarm system from the helideck or its immediate vicinity.

The alarm system activation button shall be clearly marked.

4.2.2 Fire alarms and general alarms

Alarm buttons are located at the helideck's fire posts. These shall be used only in emergencies, such as a fire in a helicopter or on the helideck.

4.2.3 Fire Alarm Boxes (FABs)

FABs for activating fire pumps are located by the helideck.
Activating the switches in these boxes will start the pump(s) and notify the control room which FAB has been activated.

4.2.4 Status and repeater lights

A visual notification system shall provide instant information about situations that could potentially be hazardous to pilots and helideck personnel during approach, landing and parking on the helideck. A hazardous situation could be a fire or gas alarm, or the helideck exceeding specified motion limits. These factors shall automatically activate the system, and helideck personnel shall also be able to activate it manually as needed.

Repeater lights shall be connected to the facility's HMS equipment, and shall activate when motion limits are exceeded on a moving helideck.

Status and repeater lights shall flash bright red in unison to draw attention during approach and while walking on the deck.

Activated lights will communicate information about a potential hazardous situation which allows the helicopter crew to choose to abort a landing or to initiate take-off earlier than planned.

The radio shall be monitored in order to inform the pilots about the status of the helideck, as well as to notify if a situation should arise which involves an unacceptable risk to the helicopter operation. Monitoring shall be understood as personnel listening to the helicopter frequency and simultaneously being able to either report directly, or indirectly by forwarding information. Information shall be forwarded without delay.

Status updates and reports via radio come in addition to the status light functionality, where status lights are installed, and radio communication shall be descriptive, brief and clear. There shall always be a back-up radio solution available for situations where the main radio is out of service.

Certain procedures may be approved as an alternative to the use of status lights on continuously manned facilities. The reporting system shall ensure that the pilots are informed of the status of the helideck, including reports if a situation should arise which constitutes an unacceptable risk to the helicopter operation. This procedure shall be described in the facility's internal procedures, and shall be able to document that both the intent and reporting channels are safeguarded.

4.3 Fire-fighting equipment

Regulatory requirements for helideck fire protection can be found in regulations issued by Havtil, the NMA and the CAA-N; see Chapter 1.4.

The helicopter landing officer (HLO) shall ensure that the fire-fighting equipment is always in compliance with regulatory requirements and ready for use. Any nonconformities shall be reported to an immediate supervisor.

Please note: The helideck's fire extinguishing system shall not be activated until the helicopter has landed. Premature activation could cause the pilots to lose their deck reference.

4.3.1 Fire water system

A fire water system shall be installed.

4.3.1.1 Purpose and effects

Water can be used to control and/or extinguish a fire in the following ways:

- Acts as a dilutor when vaporised in the fire zone.
- Vapour reduces the oxygen content in the air current mixture by one-third.
- Absorbs heat while vaporising.
- Can be used to cool adjacent areas to prevent the spread of flames or improve access to the fire area.

4.3.1.2 Application

Water is the best extinguishing agent for fires in woodwork, paper or waste, and good for further damping down where hand-held extinguishers have been used.

4.3.1.3 Equipment

A 1.5-inch hose is standard with equipment for firewater and hosing down.
Alternatively, the foam equipment can be used to apply water only.

4.3.1.4 Use

Water should be applied to oil fires in the form of a fine spray.
It shall never be applied to electrical fires until the power supply has been disconnected.
Water shall be applied as a fine spray when used for cooling down.
With most fires, the water jet shall be directed at the base of the flames.

4.3.2 Foam systems

4.3.2.1 Purpose and effects

Foam can control and/or extinguish a fire in one or more of the following ways:

- Serving as a smothering agent

- If applied in sufficient quantities, reducing the oxygen supply to prevent air influx.
- Acting as a dilutor.
- When directed into a fire zone, vaporises and in certain circumstances reduces the oxygen content in the air current mixture by up to one-third.
- Absorbing heat through the vaporisation process.
- If applied in sufficient thickness, it can protect potentially explosive substances exposed to a fire by absorbing heat and insulating.

Fires involving flammable liquids can be extinguished by laying down a thick layer of foam. This layer shall have the right consistency and thickness and shall be maintained for a sufficient amount of time.

4.3.2.2 Application

Foam should be applied in the largest possible quantities in order to cover the entire fire surface.
Foam is appropriate for all types of fires, except electrical.

4.3.2.3 Equipment

A helideck normally has three foam monitors and three hose reels. The exceptions are certain older models which only have two monitors and two reels (only two fire posts). On newer helidecks with pop-up systems, another possible solution is to have only reels and dual-agent skids - in other words, no monitors.

Foam is produced by combining these three components in a turbulent condition:

- Water.
- Air.
- Foam concentrate.

This is normally achieved by injecting the concentrate under pressure in the water stream.
Foam production normally begins 15 seconds after the equipment is turned on.

4.3.2.4 Use

The fixed foam system is operated from permanently installed release cabinets for fire-fighting.
After use, the foam piping shall be thoroughly flushed with water to remove remaining foam solution.

Note that using excessive water will break down the foam.

4.3.3 Dry powder system

4.3.3.1 Purpose and effects

Dry powder has the following effect in very fine form:

The fire's chain reactions are broken by adding a large quantity of fine powder particles to the atmosphere.

Remember: When fighting a fire with dry powder, vaporisation through the powder could allow re-ignition from hot metal, smouldering insulation, etc.

4.3.3.2 Application

Dry powder is effective against most types of fires, particularly electrical ones, since it is non-conductive.
When used to extinguish a petrochemical fire, re-ignition is highly likely to occur unless possible ignition sources are removed.
Foam shall be used to prevent re-ignition.

4.3.3.3 Equipment

The equipment uses a gas cartridge propellant, with the powder driven out by internal overpressure.

This overpressure is created by discharging a CO2 cartridge inside the extinguisher.

4.3.3.4 Use

The powder will normally start discharging within 15 seconds of activating the fixed equipment.
The units should be directed at the base of the flames and, if possible, in the direction of the wind.

All hoses shall be cleaned of powder residues immediately after use
in order to remove powder/lumps which could later block the hose/piping.

4.3.4 Maintenance

All rescue and safety equipment shall be maintained in good working order and be ready for use at all times. Maintenance, periodical testing and inspection shall be conducted in accordance with established procedures.

5 OPERATIONS

This part of the manual describes operational restrictions and the helideck crew's routine duties during helicopter operations.

The duties of each helideck crew member for take-off and landing and on stopping and starting of the rotor and engines are presented step-by-step in appendices F and G.

Operations related to the refuelling plant and refuelling are described in Chapter 6 on aviation fuel and Appendix J on the procedure for helicopter refuelling with the rotor running.

See also Chapter 7.4 on refuelling in strong winds.

5.1 Helideck operations

5.1.1 Using anti-collision lights to signal the helideck crew

Anti-collision lights are powerful rotating red beacons normally located near the tail rotor.

Once the helicopter has landed and is ready to be unloaded, its anti-collision lights will be switched off. This signals that the helideck crew can approach in order to do their work. See Appendix B on danger zones.

The pilot will turn on the anti-collision lights immediately before departure or when conditions require it. This signals that the helideck crew shall leave the helideck immediately. The HLO gives the thumbs-up signal when all personnel (including the HLO) have left, and all objects are removed.

5.1.2 Using the chocks

This procedure applies for all helicopters with wheeled landing gear during operations on fixed facilities, mobile rigs and vessels.
Standard hand signals shall be used. See Appendix A.
Exemptions from this procedure include helicopters in shuttle traffic with both pilots in the cockpit and MedEvac. Chocks can then be used at the pilot's discretion.

Standard procedure:

- The chocks shall be put in place as soon as the anti-collision lights are switched off.
- They shall be placed in front of and behind both main wheels.
- Both pilots shall remain in the cockpit until the chocks are in place.
- The chocks shall be removed when both pilots are in their respective seats and the pilot has signalled "chocks away".

5.2 Cargo in the helicopter

5.2.1 Introduction

Restrictions described in this paragraph apply for all helicopter types.
The restrictions are in addition to regulatory requirements (EASA OPS).

Passenger luggage shall not exceed 10 kg per item. Cargo sent by helicopter should not exceed 15 kg per item. Heavier items shall be split up if possible. Exceptions may be made for priority consignments. These shall then be specially labelled as heavy cargo, with the weight listed on each item, and the facility/destination shall be notified.

5.2.2 Passenger/cargo manifest

When passengers, luggage and/or cargo are carried by helicopter, a passenger/cargo manifest shall always be completed and accompany the helicopter.

The completed passenger/cargo manifest is considered an official document and may be subject to inspection.

Passengers shall be weighed during check-in at the heliport. The helicopter manifest shall reflect the actual weight + weight of survival suit (7 kg). The same weight shall be used for the passenger on their return flight from the facility:

- Men 214 lbs / 97 kg.
- Women 176 lbs / 80 kg.

This is in addition to the weight of cargo/luggage.

The manifest shall contain the following information:

- Full names of passengers.
- Their employer(s).
- Weight of passengers.
- Weight of luggage (per person).
- Weight of cargo/luggage.
- Description of the contents of each item of cargo.
- Destination.
- Information about passengers registered as XBR.

When cargo is to be sent ashore from a facility, the HLO is responsible for checking the cargo manifest and ensuring that it accompanies the shipment. The HLO is responsible for verifying that the number of passengers on board matches the passenger manifest, that passengers marked XBR on the manifest are wearing XBR armbands, and for handing the manifest over to the helicopter crew. When loading a Super Puma, the pilot shall be informed of the total weight in cargo compartment 3.

The helideck operator shall ensure that the actual weight of luggage and cargo matches the helicopter manifest.

5.2.3 Cargo and passengers together in helicopter cabin

Cargo and passengers cannot be transported together in the helicopter cabin.

5.2.4 Loading the cargo compartments

Correct loading pursuant to the certification and approval of the individual helicopter type, is crucial in relation to the machine's weight and balance. The flight manifest needs to inform the pilots on how much weight the facility is planning to place in the helicopter so that they can correctly calculate fuel consumption and total payload.

The facilities need to ensure the following:

- Follow the loading instructions described in Appendix E for the helicopter type in question.
- Assess each item in terms of size and weight.
- Take the time required when loading a helicopter.
- Pay special attention if the flight is split between two or more facilities.

5.2.5 Luggage-free cabin

Passengers are not allowed to bring hand luggage into the cabin. All forms of bags, briefcases, portfolios and so forth are considered to be hand luggage. Magazines, newspapers and paperbacks are exempted.

5.2.6 Transporting cargo in the cabin

In the event that cargo is placed in the passenger cabin, the cargo shall be secured in accordance with the helicopter operator's procedures.

Note: The Sikorsky S92 features a specially designed loading ramp on the cabin floor to protect the floor and facilitate loading and offloading. Instances where this equipment is used will be coordinated between the helicopter operator and receiving installation, well before the flight takes place.

5.2.7 Transporting passengers and cargo

In accordance with EASA Part OPS Helicopter ORO.GEN.110(j) and EASA AMC1 SPA.DG.105 (a) and (f), transport of passengers and goods by helicopter requires that the personnel involved in the operation have the necessary awareness training for dangerous goods. This is intended to ensure that personnel are able to spot dangerous goods in passenger luggage and to identify/spot unlabelled cargo which could be dangerous goods.

Dangerous goods normally cannot be sent from facilities/vessels without special competence in packing and declaration, as well as approval from the helicopter operator.

Course and competence requirements are described in Chapter 3.2 - Competence and experience.

This course shall be repeated every 24 months and requires a separate test.
It is part of the Offshore Norge basic and refresher courses for HLOs.

The following supplementary course is also required for transport of dangerous goods.

In order for a facility/vessel to send dangerous goods by helicopter, the IATA regulations require that the dedicated person responsible for receiving, packing and documentation has completed an IATA dangerous goods course. This course shall be repeated every 24 months to remain valid. Similarly, test results from the course shall be available on the facility/vessel at all times.

5.2.8 Transporting oil samples

5.2.8.1 Transporting crude oil samples

Crude oil samples are considered dangerous goods and shall be declared and shipped by personnel with an approved dangerous goods authorisation.

5.2.8.2 Transporting other oil samples

The following procedure shall be followed for shipping oil samples (e.g., hydraulic and lube oil, but not crude oil):

- Identify the oil to be shipped and acquire the correct data sheet.
- Check section 14 of the data sheet and verify that the oil is not classified as dangerous goods.
- Declare the shipment as "Oil Samples, non-dangerous goods" in DaWinci and on the manifest.
- Pack the shipment in unbreakable containers along with shock and liquid absorbent substances, all packed in a solid outer container.
- Label the shipment "Oil Samples, non-dangerous", and include the data sheet.

5.2.9 Transporting fish

To avoid corrosion and/or damage to luggage, the following restrictions apply to fish transport:

- The fish shall be packed in water-tight containers, or
- The fish shall be frozen and packed in absorbent materials, as well as sufficient plastic or similar to prevent damage in the event of possible thawing.

5.2.10 Personal Locator Beacon (PLB)

On flights where PLBs issued to passengers are to be left behind in the helicopter, the HLO is responsible for checking that departing passengers do not take their beacon with them.

If PLBs are left behind at the facility, the heliport responsible for their day-to-day use shall be informed.

5.3 Communication

This part of the manual presents procedures and guidelines for communication between the helideck crew and the helicopter pilots. Further guidance can also be found in Appendix H.

5.3.1 Language

Communication in the aviation sector normally takes place in English. It may be appropriate to communicate in Norwegian if English-language skills are limited and both sides speak Norwegian.

5.3.2 Responsibilities

The HLO shall report that the helideck is cleared for landing, in addition to providing safety-related information, such as the deck being out of use due to an alarm, landing gear failing to deploy, loose objects which might have hit the rotor, oil or fuel leaks or helicopter faults (loose covers, etc.).

If one pilot leaves the helicopter, the HLO shall monitor communication with the other pilot in the helicopter, and verbally communicate with the pilot on the helideck.

5.3.3 Establishing radio communication

The following shall be done before radio communication is established:

- Check that the correct frequency is being used.
- Listen first to ensure that existing communication is not interrupted.
- Prepare what you want to communicate.

If a radio station hears a call without identifying the call sign of the station being called, it shall not respond until the call sign is repeated and understood.

If a station is called without catching the caller's call sign, the following phrase shall be used: ”Station calling, this is Statfjord B HLO, say again your call sign”.

5.3.4 Helicopter's call sign

The helicopter’s call sign can be, for example, Norske (NOR), Helibus (HKS), Lufttransport (LTR), Shuttle, or Rescue, along with specific numbers for the flight.

5.3.5 Radio failure

Although modern radio equipment is reliable, there is always a risk of failure in radio communication between the helicopter and helideck.

In practice, radio failure will be suspected if the helicopter fails to respond when called or if the frequency falls silent.

If radio failure is suspected, contact shall be made with another member of the helideck crew or the radio operator to ensure that the helicopter pilot receives the information.

In exceptional circumstances, hand signals can be used to indicate that the helideck is cleared for landing.

5.3.6 Phraseology

Specific words and expressions - known as standard phraseology - are used in radio communication between helicopter and ground station in order to facilitate understanding. We recommend using standard phraseology as much as possible.

Appendix D on phraseology provides a list of standard English expressions and their Norwegian equivalents.

5.3.7 Frequencies

The information frequency for the helicopter service is used for:

- Deck clearance.
- Wind direction and strength.
- Other information that could potentially be significant for flight safety.

Where two frequencies are used, all other communication shall take place on the **logistics frequency** (which requires a different fixed radio).

6 AVIATION FUEL - INTRODUCTION

These guidelines cover the minimum requirements for using equipment to supply fuel to the helicopter. It is important to ensure that the helideck crew are well-acquainted with these guidelines and associated safety requirements.

All maintenance and repairs, apart from what is described in the approval of the refuelling plant, shall take place in consultation with the accredited certification body.

6.1 Purpose

This chapter covers operational guidelines for, as well as checks and handling of Jet A-1 aviation fuel.

6.1.1 Personnel duties

Each facility is required to have a preventive maintenance programme in place to cover the plant in safety and environmental terms, and to ensure that the measures adopted comply with applicable regulations.

The most important duties for personnel using the plant are to always deliver the right fuel quality, to keep the product free of water and polluting solids, and to refuel in a safe, secure and efficient manner.

The HLO is responsible for day-to-day supervision of refuelling operations. The HLO shall ensure that all work is done safely and in accordance with applicable procedures and instructions. All checks relating to operations shall be logged.

6.2 Sampling and checking

6.2.1 Introduction

Jet A-1 shall be quality-assured from refinery to consumer, with traceability at every stage pursuant to relevant guidelines.

Samples shall be taken by competent personnel with the correct procedures and equipment. It is important to ensure that the person conducting the water detector tests is not colour-blind, as it is important to ensure that the sample taken is an accurate representation of the tested product. All sampling shall be logged.

Once the test is complete, the sample capsule shall be checked to confirm its function, by applying water and seeing if it changes colour to green.

6.2.2 Water

Water can occur in fuel in two forms:

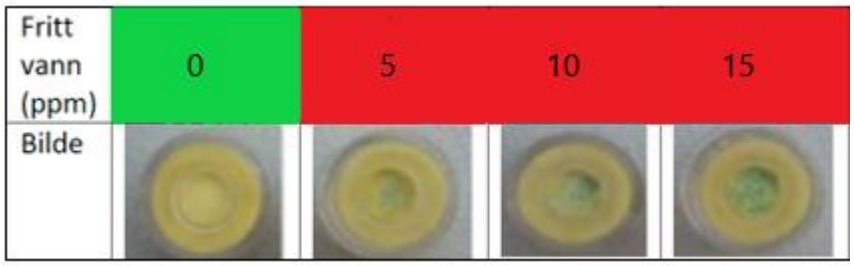
- As separated water, i.e., fine / small droplets separated from the fuel. The separated water can be removed / separated from the fuel in the filter separator.

Any water that passes through will be separated in the Dirt Defence/Water Barrier.

- As water molecules loosely attached to the fuel molecules.

Water molecules attached to fuel molecules cannot be removed by these methods.

This is nevertheless not insignificant for the fuel, despite occurring only in minute quantities. Such fine dispersal can arise as the water and fuel travel through a pump or microfilter. A visual inspection will normally reveal finely dispersed water, but experience shows that the turbine fuels used by aircraft may present borderline cases which cannot always be detected by the human eye. The Shell Water Detector was developed to deal with this. It comprises an unbreakable 5 ml injection syringe and a plastic detector capsule containing water-sensitive paper. The test provides a positive indication of finely dispersed water in concentrations of 5 parts per million (5ppm). If the detectors reveal a change in appearance in concentrations as low as 5 parts per million (5ppm), a new sample shall be taken, and the fuel cannot be used until a negative sample is taken.



The examples above illustrate 0, 5, 10 and 15 ppm. The three on the right, specifically 5, 10 and 15 ppm of free water, are not approved and require further settling and/or draining.
Only the example without an indication of water is approved and found to be acceptable.

6.2.3 Visual inspection

For the fuel sample to be accepted, it shall be the correct colour, visually clear and bright, and free of particles and dispersed water at normal temperatures.
The colour of Jet A-1 varies from watery white to straw yellow. See also the section on "Visual check".
Undissolved water will appear as droplets on the inside wall of the sampling container or as water at its bottom. It may also fog the sample and render it opaque.

Particles and other visual pollution generally comprise rust, sand or dust, either suspended in the fuel or as sediment at the bottom of the container.

Automatic cyclonic movement can be achieved in samples taken in the fixed sampling containers by releasing the fuel sample on the outer edge of the glass. This ensures that particles and larger water droplets collect at the bottom of the container.

It is therefore important that samples taken from the portable tanks are vigorously rotated to create this cyclone effect..

Satisfactory result
When none of the above-mentioned signs are visible, and the sample is clear without sediment.

Unsatisfactory result
The sample is not clear and bright, showing that water or pollution is present.

If the sample contains sediment and/or free water:

- Further samples are taken until the fuel is clear and free of water (clear and bright).
- If a sample contains finely dispersed water, a settling time of one hour per metre of tank depth is allowed before conducting a new purity test.
- This process will continue until the sample is completely free of water or sediment (clear and bright, satisfactory test result).

The following points provide guidance for conducting a visual check of fuel samples.

- Colour: jet fuel can vary from completely clear (like water) to straw yellow.
- Water: free water will normally appear as droplets on the wall or at the bottom of the sample container (free floating), and can also appear as a misty cloud in the fuel (emulsified).
- Particles: largely comprise small specks of rust, sand, dust or scale from hoses and equipment, and settle at the bottom of the sample container.
- Clear and bright: this term is independent of the natural fuel colour. "Clear" indicates that no sediment or emulsion is present. "Bright" refers to the clear, bright appearance of the fuel when completely clean. If particles or water are found, new samples shall be taken until the sample is clear and bright.
- Control check: this check comprises a visual check plus fuel density, and is carried out to ensure that the quality is correct and that the fuel has not deteriorated or become polluted during storage. The result of this sample shall be compared with the values on the certificate. When the actual weight has been corrected to the standard value (15°C), the variation shall be no more than 0.003 kg/l. If the variation exceeds this limit, the product shall be quarantined and withheld from delivery until the reason for the variation has been established and a new approval issued.

If nonconformities are detected in the form of technical problems with the plant, competent personnel shall be summoned.

6.3 Tests and inspections

Use Shell's water detector to check samples taken from Jet A-1 helicopter fuel.
If a detector changes colour, it is extremely important that the procedure described below is followed to remove pollutant(s) from the fuel. The detector comprises the following components:

- An unbreakable 5 ml injection syringe
- A plastic detector capsule containing water-sensitive paper.

Alternatively, an approved EI 1596 water sensor can replace the Shell water detector test.

6.3.1 Storing Shell water detector capsules

The capsule lid should be screwed on as soon as possible after removal from the container to avoid the risk of the paper being discoloured by air humidity.
Capsules shall therefore not be left lying around loose or kept in the pockets of coveralls / clothing.

Maximum storage time for a detector capsule is nine (9) months from the production date.

- The expiry date will be stamped on one side of the storage box.
- It will also be stamped on each capsule and shall be strictly observed.

Unused capsules shall be stored dry indoors in their container until they are used.

6.3.2 Water detector test procedure

The following procedure shall be used for water detector tests:

- Check that the capsules have not passed their expiration date (shown on box/container).
- Have a sample of at least 3.5 l ready in a clean and clear container.
- The sample shall be rotated vigorously until a cyclone effect arises in the container, causing particles to accumulate at the bottom of the container and possible water particles to be dissolved into the fuel. This happens automatically in the sealed sampling containers.
- Attach the capsule to the syringe and immediately immerse both in the sample.
- Withdraw the plunger until fuel reaches the 5 ml mark.
- Take care that the plunger is not withdrawn until the syringe is immersed in the liquid, otherwise air humidity will create an indication in the detector capsule and lead to a faulty reading.
- Possible water droplets in the fuel will be absorbed by the paper fibres, releasing and spreading the colouring and thereby creating a distinct colour change.
- If this colour change occurs, the fuel is contaminated with water and shall therefore not be used. The part of the paper protected by the plastic remains unaffected. A possible colour change between the outer and inner (wet) or measured areas provides a positive indication that finely dispersed water is present.
- A generally light pastel colour over the whole central part of the capsule or no colour at all can be accepted. A light-yellow pastel colour with dark specks or spots indicates that some water droplets remain suspended in the fuel and may be above the maximum permitted concentration of 30ppm.
- Further precipitation, emptying and separation are needed to remove this water so that the concentration falls below 30ppm. Large and dark specks or generally darker colour in the centre of the capsule naturally mean even more water in the fuel, which shall be removed before the fuel can be safely used in a helicopter.

- If tests are conducted just before and after refuelling the helicopter, the HLO and pilot shall together verify that the detector capsule functions correctly once the test is complete. This is done by getting the capsule wet and seeing if it changes colour to green.
- Avoid touching the test area to prevent a faulty test result.

On occasions other than refuelling:
- Wet the detector even after the test to confirm a colour change.
- A capsule shall be used only once and then discarded.

6.3.3 Draining, sampling and checking

Drainage and product sampling routines at the plant:
Drainage samples shall be taken regularly to check that storage tanks and delivery equipment are free of particles and water.

The sample shall be taken directly from the lowest point in the tank or filter arrangement.

If an unusually large quantity of water is detected, the system shall be taken out of service and competent personnel who conduct an annual inspection of the refuelling system shall be summoned to assist in investigating the cause of the contamination.

The equipment shall be drained to remove water and particles at the following intervals:
- Daily from storage tank, filter separator and Dirt Defence/Water Barrier filter before first delivery of the day.
- Filter housing, before and after each delivery.
- Storage tank and filter housing, after heavy rain and storms.

Drainage shall be conducted with full liquid flow from the tank sump, and filter housings shall only be drained with the system pressurised. Liquid shall be drained to clean, clear glass containers with a minimum capacity of 3.5 l for a visual check. If this gives an unsatisfactory result, new samples shall be taken by drainage until a satisfactory visual check is achieved. Should unusually large quantities of free water or particles be found, or no satisfactory visual check can be obtained, the system shall be taken out of service and an immediate investigation shall be launched to identify the cause of the pollution.

6.3.4 Sampling and checking:

Daily (every morning), conducted by the HLO
- Take a 3.5 l sample from the tank currently in use.
- Take a 3.5 l sample from the filter housing with the system pressurised.
- All samples shall be checked with the Shell water detector unless a new standard is adopted which can do away with the requirement for a water detector test.
- The accepted 3.5 l sample from the storage tank shall be retained for 24 hours. It shall not be exposed to sunlight. If two tanks are used in one day, the samples from both shall be retained for 24 hours. The samples shall be labelled.
- Conduct a visual inspection of the plant for damage and leaks.

- When transferring fuel, read off and note the pressure difference over the filter housing in the logbook for the helicopter refuelling system.
- Earth cables: daily check for good mechanical contact with the unit and possible damage.
- All sampling and inspections shall be logged.

Weekly, conducted by the HLO

- If the system is out of operation for more than a week, take a 3.5-litre sample from the pistol grip nozzle in addition to the other sampling.
- Alternating the pump used on a weekly basis is recommended in order to spread wear and tear between pumps A and B.
- Take a 3.5 l sample (until the sample is acceptable) from portable tanks in storage.
- Drain the air-separator collector glass.
- When pumping fuel, read off the differential pressure and note the result in the weekly pressure difference log for the separator and Dirt Defence/Water Barrier filter. If the maximum pressure difference for the filter separator and Dirt Defence/Water Barrier filter is exceeded, the filter elements shall be replaced (only step 1 for the filter). The max differential pressure for the filter separator and Dirt Defence/Water Barrier filter is 15 psi.
- Inspect all earth cables (for portable tanks, supply cabinet and pistol grip nozzle). In the event of actual or suspected faults, maintenance personnel shall be summoned. The refuelling plant shall not be used if faults are found or suspected in its earthing system.
- Once a week, differential pressures for the separator and Dirt Defence/Water Barrier filter shall be read off while pumping at the selected delivery volume. The result shall be logged.

Monthly, conducted by the HLO

- Check the delivery hose for damage and log the result, see Chapter 6.6, plus Appendix C.
- Function-test the piston-type differential pressure gauge to check that it operates correctly. This is done by opening the three-way valve connected to the gauge. It is only necessary to check that the piston moves freely throughout its length, and visually ensure that it resets correctly. Log the inspection (see appendix).
- Check the filter strainers in the pressure hose connectors and pistol grip nozzles. Following inspection, the hose shall be pressurised to check the pressure filling connector/pistol grip nozzle for leaks.
- Inspections at longer intervals than the above form part of each facility's own maintenance system.

6.3.5 Returning product to the plant

Clean and water-free Jet A-1 accumulated during draining and sampling can be returned to a drain tank for re-use or to a slop tank as waste.

Jet A-1 in the drain tank shall be given time to settle and all free water shall be drained off before the fuel is transferred to a stationary Jet A-1 tank or the same Jet A-1 tank it was taken from originally. The drain tank shall be protected against contamination. This can be done by preventing access to the tank and/or by installing signs.

6.3.6 Sampling during delivery to the helicopter

- A 3.5 l sample shall be taken from the Dirt Defence/Water Barrier filter or pistol grip nozzle before delivery and checked visually, including water detector testing. Possible water shall be drained off and a new sample taken until a satisfactory water detection test is achieved.

- A 3.5 l sample shall be taken from the pistol grip nozzle or the intake side of the Dirt Defence/Water Barrier filter immediately after the delivery is completed in order to confirm quality and to conduct a visual water detector check.

If more than a hint of water is found, or the water detector shows a clear colour change, a new sample shall be taken. The pilots and the helicopter company shall be informed immediately. No more fuel shall be supplied until the cause has been identified and corrected.

6.4 Specific gravity (density) measurement

The specification for Jet A-1 places its specific gravity (density) in the 0.775- 0.840kg/l range. This shall be checked on reception offshore. Specific gravity is measured with a hydrometer and a thermometer (which could be incorporated in the hydrometer). Testing shall be conducted in a well-lit area protected from rain and wind. The hydrometer is inserted slowly and carefully into the fuel in order to avoid breakage or wetness above the flotation level. Check that no air bubbles attach to the submerged surface. The hydrometer shall be allowed to float freely.

Allow the hydrometer to float for three to four minutes so its temperature and motion stabilise. Then push the hydrometer carefully down two marks on the scale and release it. Once the hydrometer has re-stabilised, read off the specific gravity.

Since the fuel will creep a little up along the thermometer, the level shown on the scale will be above the actual value. Look along the surface of the fuel and read off the lowest level shown. Read off to the nearest 0.001kg/l and log the product's specific gravity. Shake the hydrometer and take two to three further readings to confirm the result.

Thereafter read off the temperature. Note both temperature and specific gravity as direct readings from the hydrometer. Use these data to correct the specific gravity to 15°C using the density conversion table (ASTM-IP Table 53) or the conversion unit for fuel density (the Aristo 60 208 circular plastic slide calculator from Germany). Note the specific gravity corrected to 15°C. Note: A slide calculator will get worn over time and thereby give false readings. If one is used, it shall be inspected regularly for possible wear and tear. Specific gravity corrected to 15°C shall be within +/- 0.003kg/l of the specific gravity corrected to 15°C documented in the upper part of the transport certificate for the aviation fuel.

If an electronic density meter is utilised, the manufacturer's user manual and calibration instructions shall be observed. If the specific gravity is not within the specified limits, the guidelines for faulty fuel shall followed and the fuel possibly returned.

6.5 Basic requirements for lab samples

Samples to be certified by a laboratory shall be taken from an outlet which provides direct access to the space where the liquid is stored.
Before sampling, the equipment shall be thoroughly rinsed and containers washed at least three times in the product being sampled. The containers shall be thoroughly dried before use.
Containers shall not be filled completely. About five per cent of its volume shall remain so that the liquid can expand. Approved containers shall be used, and should be labelled and preferably sealed.

The containers shall be sealed and labelled immediately after filling. The manifest shall contain the following information:

- Date and time.
- Sample taken by (signature).
- Facility/vessel.
- Tank number
- Batch number.

Documentation for all samples shall be logged. Attach a copy of the transport certificate for the relevant product.

6.5.1 Sample containers

Containers for lab samples
Glass, metal or approved plastic containers for lab or duplicate samples shall be new or approved by the lab, and completely clean. (See ASTM D 4306 for suitable containers).

Metal containers shall be approved and preferably lined internally with epoxy.
All containers, even if new, shall be rinsed at least three times in the product to be sampled.

Containers for visual samples
Clean, transparent containers shall be used, with a minimum capacity of 3.5l and a wide opening which accepts a threaded lid. If a bucket is used for drainage, it shall be made of stainless steel or alternatively have an internal coating of white enamel and have approved earthing.

6.6 Hoses for aviation fuel - approval and inspection

Each hose shall have a permanent identification number as well as a log of inspections and checks. This shall specify the dates and years of manufacture and of entering service, as well as information on inspection findings and maintenance.

Maximum storage life is two years. Hoses have a maximum life of eight years if pressure-tested and inspected annually in accordance with API 1529/ISO 1825/EI 1529. Both

these periods shall be calculated from the date of manufacture. In the absence of annual pressure testing, the hose has a maximum service life of two years.

Before being used, new hoses shall be flushed in accordance with API 1529/ISO 1825/EI 1529 and then pressure tested. The product used for flushing shall be returned to a slop tank in the process of being filled or "settling".

All supply hoses shall undergo routine inspection and checks.

Hoses shall be kept under observation during refuelling. Should weaknesses or faults be detected, delivery shall be halted and the hose replaced.

Hoses can be inspected and checked as follows. Pull the hose all the way out and apply full pump or operational pressure with the delivery connector shut. When the hose is under pressure, check for exterior damage, leaks or other signs of weakness. When inspecting a long hose (under full pressure), the recommended approach is to form a vertical loop and then roll this slowly along the full length of the hose. Special attention shall be paid to any signs which indicate that the hose connectors are beginning to loosen. With the hose fully extended, release the pressure and inspect for soft spots. Special attention shall be paid to that part of the hose about 45 cm from the connectors, since it is particularly prone to weakening. This section shall be checked for faults by applying pressure around the area to identify soft spots, bubbles, etc.

6.7 Pressure filling connectors

During refuelling, all connectors shall be checked for leaks. Leaking connectors shall be taken out of service. Repairs and adjustments shall be logged and carried out by authorised personnel.

6.8 Pistol grip nozzles

Pistol grip nozzles shall be subject to general inspection for each delivery. If leaks are identified during use, the nozzle shall be taken out of service. Repairs and adjustments shall be logged.

6.9 Receiving fuel and receiving inspection

Tanks shall be inspected and approved before being filled on land, and an inspection certificate issued by the fuel distributor. The HLO shall check that labelling and traceability of the tank agree with the documents.

Check that the transport certificate for aviation fuel specifies the following:
type, quantity, batch number, date, tank serial number, specific gravity, verified free of solid particles and water, inspector's signature.

On receipt of fuel:

- Check that the seals on the manhole, inspection hatches and connectors are intact, and that the seals have the same unique numbers entered in the transport certificate. Also check that all dust covers are in place and intact.

- Check that the tank cradle/tank have their respective approvals, which can be read from the tank's data plate.
- Check for damage to hatches and valves, particularly protective hatches and packing rings.
- Check that seals are intact, and the tank type is labelled.
- Check whether the fuel tank ID number on the seals matches the inspection certificate.

6.9.1 Settling time

Once a tank has been placed in a stable position, the fuel shall be given sufficient time to settle before sampling begins. Settling time is three hours per metre of fuel depth.

If the sample contains sediment or free water, new 3.5 l samples shall be taken until they no longer contain sediment or free water. The following tests shall be conducted:

- Rotation test (rotate the sample vigorously before making a visual check).
- Clear and bright test (visual check).
- Shell water detector.

Criteria for accepting a sample are that it:

- Passes the clear and bright test.
- Is free of water.
- Is free of pollutants.

If one or more of these criteria are not met, a further settling time of one hour per metre of fuel depth is allowed. All the specified tests shall then be repeated.

In certain cases, it may be necessary to extend the settling time and drain off larger volumes before an approved sample can be achieved.

Note the final test results (from the final settling time) and sign the recipient's copy of the transport certificate.

Both receiving fuel and the test results shall be noted on the aviation fuel transport certificate.

Helicopter fuel shall not be used until the above-mentioned procedures have been conducted and satisfactory test results obtained.

6.9.2 Non-approved fuel

Before returning fuel, which fails to meet the requirements for purity, specific density or water detection, allow it a further settling time before sampling and testing at least three more times.

Check the equipment and instruments (try a new set if available) and ensure that the tests are being conducted in accordance with the procedures.

If the test results remain uncertain, let another person conduct the tests on their own.

If this confirms the unsatisfactory or uncertain results, a superior shall be informed.

When the fuel and/or tank cradle fail to meet the specified standard, note the following at the bottom of the aviation fuel transport certificate:

- Details of the fuel and/or deficiencies with the tank cradle.
- Name of the facility.
- Date.
- Signature of reporter.

Return the completed original certificate to the cartridge on the tank cradle.

Label the transport tank as specified below and enter the following in the cargo manifest:

- Non-approved fuel.
- From: (name of the facility).
- To: (fill out).

6.9.3 Using fuel directly from a transport or storage tank

Depending on plant design on the various facilities, fuel received can either be transferred from the transport tank to fixed (stationary) storage tanks or stored in the actual transport tank by connecting this to the fuel system.

6.9.4 Fuel in the transport tank

If the transport tank is used for storage, an earth cable shall be attached to the tank cradle. This shall also be attached during the transfer of the tank contents to permanent (stationary) storage tanks. The tank is connected to the pump's manifold system with the aid of a pliable/flexible hose (corrugated steel pipe) which connects to the coupling on the transport tank. Alternatively, a hose approved according to EI 1529/ISO 1825 can be used. Only one tank at a time shall be connected to the pump's manifold system.

6.9.5 Transferring fuel between transport and storage tanks

The following tests shall be conducted to verify fuel quality when transferring it from the transport tank frame to the storage tank and/or between different storage tanks, including transfer from the recirculation/sample tank:

- Visual inspection.
- Water detector test of a 3.5 l sample taken from the tank frame/tank's drain point.

Make sure that the tank receiving the fuel has sufficient volume to accept it. When transferring from the transport tank frame:

- Connect an earth cable to the transport tank.
- Connect the transfer hose and open the tank valve.
- Start transferring fuel, which shall be guided in and not allowed to fall freely into the tank.

- When the transfer is complete, disconnect the dry connection (hose) and earth cable.

Procedures after the fuel has been transferred:

- Conduct a visual check. Allow a settling time of one hour per metre of fuel depth in the tank.
- Then take a 3.5 l sample from the tank's drain point and conduct a water-detector test. If the sample contains sediment and/or free water, new samples shall be taken until they show no sediment/free water.

This process shall be repeated until satisfactory results are achieved. If the samples remain unsatisfactory after the fourth settling time, investigations/ corrective measures shall be initiated.

6.9.6 Labelling and replacing tanks

To avoid confusion over which tanks are in use, they shall be labelled to show their status. The following texts shall be used:

- Tank has been received and stored since _____ (date).
- Tank in use.
- Tank settling.
- Tank empty.

Please note: Also applies to transport tanks used for storage/supply.

6.10 Old fuel stocks

As far as possible, surplus fuel stocks should not be stored offshore. They should be run down if the period between replenishments is expected to be lengthy.

If fuel has been stored for six months from the filling date, a 3.5 l drainage sample shall be taken in a special container. This shall be sent to an approved lab for quality control. Should the sample show that the fuel meets the required specifications for use, the fuel can be used in the normal manner.

Using old fuel is prohibited until the sample results are available and approval has been received from the fuel supplier/lab.

If the results are satisfactory, the stocks can be used but shall be re-tested every three months.

Fuel which has samples that are not approved shall be returned to land as "non-approved"; see Chapter 6.9.2.

6.10.1 Returning transport tanks

All connectors and covers on transport tanks shall be sealed before being returned to shore. A seal with a unique ID number shall be used, and this number shall be affixed to the transport certificate, which shall always accompany the transport tank. Check that

the protective cover has been placed over the hose connector. Do not put other waste substances or contaminants in these tanks to simplify filtration and re-use of the fuel.

6.11 Fuel delivery / refuelling

6.11.1 Refuelling personnel

Refuelling shall be carried out by competent personnel who are well trained in the procedures for and operation of the refuelling system. Sufficient crew shall be deployed to ensure safe operation and to act correctly in the event of an emergency. They shall be familiar with the location and functioning of the emergency stop buttons.

Appendix J outlines the duties of each member of the helideck crew, step by step, when refuelling.

6.11.2 Earthing between helicopter and refuelling equipment

The helicopter, supply cabinet, pistol grip nozzle/pressure filling connectors shall be connected throughout the refuelling operation in order to conduct electricity so that no electrical potential (voltage difference) can arise between them.

Earthing between the helicopter and supply cabinet shall be in place before any hose is connected to the helicopter or the fuel tank cover is opened. Earthing shall remain in place until all hoses have been disconnected and the tank cover is replaced.

Please note: Only use authorised earthing connection points on the helicopter.

6.11.3 Refuelling procedures (general)

The following refuelling procedures shall be followed:

- Refuelling is not permitted during heavy local thunderstorms.
- The hoses shall be laid out in a way which prevents damage. Avoid kinking or twisting the hoses. Pressure filling connectors or pistol grip nozzles shall not be dragged along the ground. Dust caps shall be in place when connectors/nozzles are not in use.
- During refuelling, the delivery unit shall be checked for leaks, the differential pressure on the Dirt Defence/Water Barrier filter shall be observed and logged, in addition to reading off and monitoring the other instruments.
- Fuel spills are a fire hazard and harmful to the environment. Hot helicopter engines may be an ignition source, and particular care shall be taken during refuelling. If a spill occurs, refuelling shall be halted and the necessary measures taken in accordance with local provisions/routines.
- If air intrusion in the plant is expected, the following procedure shall be followed:
  - The first 200 litres shall be filled with a gravity pistol.
  - Alternatively, 200 litres can be transferred to the recycling tank before refuelling starts if such a system is installed on the plant.

6.11.4 Refuelling with the helicopter's engines running

Refuelling a helicopter with the engines running (hot refuelling) entails very stringent demands on safety routines.
See Appendix J for procedures.

6.11.5 Defuelling a helicopter

Defuelling is conducted with the same safety procedures and personnel as refuelling.
The HLO shall ensure that:

- The returned fuel is of known quality and type (JET A1).
- The quantity of returned fuel is logged, including where it was returned from.
- Returned fuel settles and is drained of free water and particles before the product is ready for new delivery.

Defuelled fuel shall as a minimum be passed through a filter water separator.
Fuel defuelled through a water separator or Dirt Defence/Water Barrier filter can be redelivered without prior settling and draining.

6.11.6 Refuelling with passengers on board

Refuelling can be conducted with passengers aboard by agreement between pilot and HLO, and shall follow the standard procedure (see Appendix J), in addition to the following:

- The pilot and HLO shall be present and continuously monitor the operation.
- The pilot shall give the passengers a safety briefing before refuelling begins.
- Passengers shall not have their seat belts on during refuelling.
- Doors shall be closed on the same side as the refuelling.
- Doors shall be open on the opposite side to the refuelling.
- Escape routes shall be planned, accessible and known to everyone concerned.
- The helicopter operator's procedure for refuelling with passengers on board shall be available and known to the helideck crew.
- The facility's procedures shall be known to the helicopter crew.

6.12 Overview of necessary documentation

Results from all checks, refuellings and samples shall be logged in updated documents which are easily accessible. Digital documentation is approved as long as its quality is as good as or better than the forms listed in Appendix C.
The documentation shall be retained for at least one year. Its minimum content is listed below.

6.12.1 Documentation – quality control

- The helicopter refuelling log features requirements for daily sampling/inspection.
- The filter/differential pressure log and the transport log for helicopter fuel shall also be used.

6.12.2 Documentation – maintenance

- Log for recording all work done by every unit of the equipment.
- Log for testing pressure refuelling connector/pistol grip nozzle.
- Log for inspecting and testing hoses.
- Log for calibrating flow meter.
- Log for calibrating pressure gauge.
- Log for tank inspection and cleaning.
- Log for filter equipment - inspection and maintenance.
- Log for the strainer in manual pistol grip nozzles - inspection and replacement.

Documentation for the performance of these duties shall normally be found in the facility's preventive maintenance programme, which shall be carried out by certified personnel.

6.12.3 Signature/retention time

All documentation shall be signed by the person doing the work. Documentation shall be retained for at least three months for daily checks, for at least a year for weekly and monthly checks, and for at least three years for checks made at longer intervals and for all non-routine incidents.

6.12.4 Change of location

Remaining fuel shall be gauged and the quantity noted when the facility moves to a different departure base and/or when a rig changes helicopter operator. The measured quantity shall be reported in writing to the relevant owner of the fuel as soon as possible and no later than five days after arriving at the new location.

7 SPECIAL PROCEDURES AND OPERATIONS

This chapter covers special procedures and operations utilised on specific facilities and helicopter types, under special conditions and so forth. They are therefore not covered elsewhere in the manual.

7.1 Emergencies

Action taken shall be in accordance with emergency procedures for the facility.

7.1.1 Basic principles

Teamwork
The helideck crew shall work together as a team when tackling emergencies.
Discuss how various emergencies on the helideck will be tackled and conduct drills on responding to these in order to identify rapid countermeasures, forms of collaboration and effective action.

Reactions in emergencies
Use common sense when reacting to emergencies.

Normal response sequence:
- Assessing the extent of the emergency and securing personal escape route.
- Calling for help/sounding the alarm.

Respond to the emergency by:
- Locating its source.
- Extinguishing/eliminating.
- Rescuing personnel/reducing risk.
- Preventing further spread.

Maintain a fire watch to prevent re-ignition/repetition.

7.1.2 Fire in helicopter/on helideck

Initial response
- If refuelling is under way, halt it immediately.
- Activate fixed firefighting equipment.
- Sound the alarm.
- Put on fire protection equipment (the fireguard will already be wearing this).
- Determine the fire source(s).

Responsibilities

HLO	Sounds the alarm/reports. Confers with pilot and coordinates response. Where possible, confers with the pilot before starting to use fire-extinguishing equipment.

Heliguard	Works with the fireguard and the HLO to extinguish the fire and reduce the danger.
Fireguard	Operates the fire-extinguishing equipment.

Fire/search and rescue team
If the blaze is extensive, the facility's fire/search and rescue team will be involved in extinguishing it and will take over responsibility from the helideck crew.

Rescue
In some cases, the helicopter crew/passengers can be rescued before the fire grows too big. If a rescue operation seems possible, it should be attempted.

However, the fire extinguishing equipment shall be used to cover personnel making this effort.

- Should the helicopter cabin have to be entered to rescue people, crew shall:
- Use smoke-diving equipment.
- Keep as low as possible while entering. Keep below smoke and fumes, where the largest oxygen volumes will be found.

Fire watch
When the fire is extinguished, crew should maintain a fire watch at the site to prevent re-ignition. The foam carpet shall be maintained to the extent required.

7.1.3 Crashing on the helideck

Because the helicopter has no wings, the engine(s) and fuel tanks are located in the immediate vicinity of the cabin.

In the event of a crash, this means that:

- Rotor blade components may be flung around.
- The helicopter is less like to remain standing vertically.
- It is easier to drag hoses around a helicopter, and sheltered areas under the fuselage are considerably smaller.
- The rapid effect could be crucial because the cabin, engine and fuel tanks are so close together.

Should a helicopter crash on the helideck, the fireguard shall:

- Activate the fire pumps/sound the alarm.
- Cover the helideck with foam.
- Extinguish possible fires.
- Ensure the fire watch is maintained, particularly with regard to fuel spills which could run down to lower decks on the facility.

Rescuing passengers and pilots

The design of helicopter doors and hatches is relatively simple and they are unlikely to jam. If jamming does occur, they shall be forced open.

If more forcible methods are needed to enter the helicopter, cutting shall be confined to specific points - such as emergency exits and windows.

Use the rescue equipment listed in Chapter 4.1.10.

If the helicopter is lying on its side, those on board shall be supported when their seat belts are released.

Please note: Helideck crew shall have detailed knowledge of the helicopter types as described in the illustrations in Appendix E.

7.1.4 Crashing into the sea

Notification:
Ensure that the radio operator/control room are notified.

The radio operator/control room will handle further notification in accordance with the facility's internal procedures.

Helideck crew will respond in accordance with the facility's emergency response plan.

7.1.5 Forewarned emergency landing

Preparations

If the helicopter has warned that it has problems and needs to make an emergency landing on the helideck, preparations shall be made to handle the situation.

Ensure that the radio operator/control room are informed, and that the correct alarms have been activated. The emergency response team shall be mobilised in accordance with the facility's internal procedures. All members of the helideck crew shall wear fire protection gear.

Put on smoke-diving equipment.

<u>Dry powder equipment</u>
Prepare the fixed powder extinguishing hose for immediate use. See chapter 3. Stand in a sheltered area with this equipment at the ready.

7.2 Safedeck helideck

7.2.1 General description

A Safedeck is designed with surface drainage which prevents accumulation of fuel by allowing it to drain away, thereby preventing it from maintaining a possible fire in the enclosed piping system beneath the deck.

7.3 Boarding/disembarking in high winds

7.3.1 Introduction

The upper limit for regular passenger transport is 60 knots including gusts.

The wind on the helideck may deviate from the stated wind measurements.

The helideck's surroundings may give rise to lee and/or funnel effects as well as turbulence, which can radically alter the wind field.
These local conditions will differ on the various facilities and also vary with the wind direction.

7.3.2 Risk-reducing measures

When winds in excess of 50 knots are forecast, each facility will seek to reduce wind exposure for the passengers. Relevant measures could include:

- Careful evaluation in selecting the exit/access least exposed to the wind.
- The heliguard and fireguard will help passengers to and from the helicopter.
- Passengers carry only one item of luggage to leave a hand free.
- The heliguard and fireguard will handle all luggage on the helideck.
- Keep zippers on survival suits fully zipped up.

It may be relevant to reinforce staffing on the helideck in such circumstances. The HLO will continuously assess conditions on the deck and, in consultation with the helicopter pilot, determine how best to ensure passenger safety.

If the HLO determines that passenger safety can no longer be maintained in a fully acceptable manner, they can halt helicopter operations on their facility. The OIM or equivalent shall be informed.

7.4 Refuelling in high winds

In special circumstances/emergencies, it could be necessary to refuel a helicopter in winds stronger than 60 knots. Special precautions shall then be taken.

The pilot will brief the helideck crew about any special procedures to be followed or precautions to be taken.
The HLO should summon qualified helideck personnel to reinforce the helideck crew.

7.5 Flights to normally unmanned facilities

7.5.1 General

In this context, an unmanned facility is one with an operational helideck in accordance with the regulations, but with no personnel on board when the helicopter lands/takes off.

Flying to unmanned facilities should be kept to a minimum and conducted in daylight.

No transit passengers shall be on board the helicopter.

Should there be personnel on the facility, staffing and operation will be as for a manned facility. The exception is if the helicopter is returning empty to collect a group which has previously been put down on the same facility.

When flying to an unmanned facility, the helideck crew should comprise three, but no less than two, qualified heliguards. One of these is the HLO, while the other is designated the fireguard. Both shall have documented knowledge of the facility's helideck and equipment.

The helideck crew shall wear approved survival suits during transit to and from the unmanned facility and should preferably be seated by the door for rapid exit and entry. Personal firefighting equipment (not a smoke-diving set or extra cylinders) are taken into the helicopter cabin when flying to unmanned facilities. Hard hat and gloves need not be worn during transport.
The helideck crew leave the helicopter first, prepare the helideck and don firefighting equipment (if necessary) before passengers exit and cargo is unloaded.

Landing and take-off shall be observed from the parent facility or a standby vessel, either visually or via video monitoring of the helideck.

As on manned facilities, inspection forms and maintenance routines shall be in place.

Where mobile facilities are concerned, motion data (pitch, roll and heave) shall be available on the parent facility in accordance with the HMS standard.

Helideck crew and the helicopter shall be in radio contact with the parent facility or standby vessel throughout the helicopter operation where camera monitoring

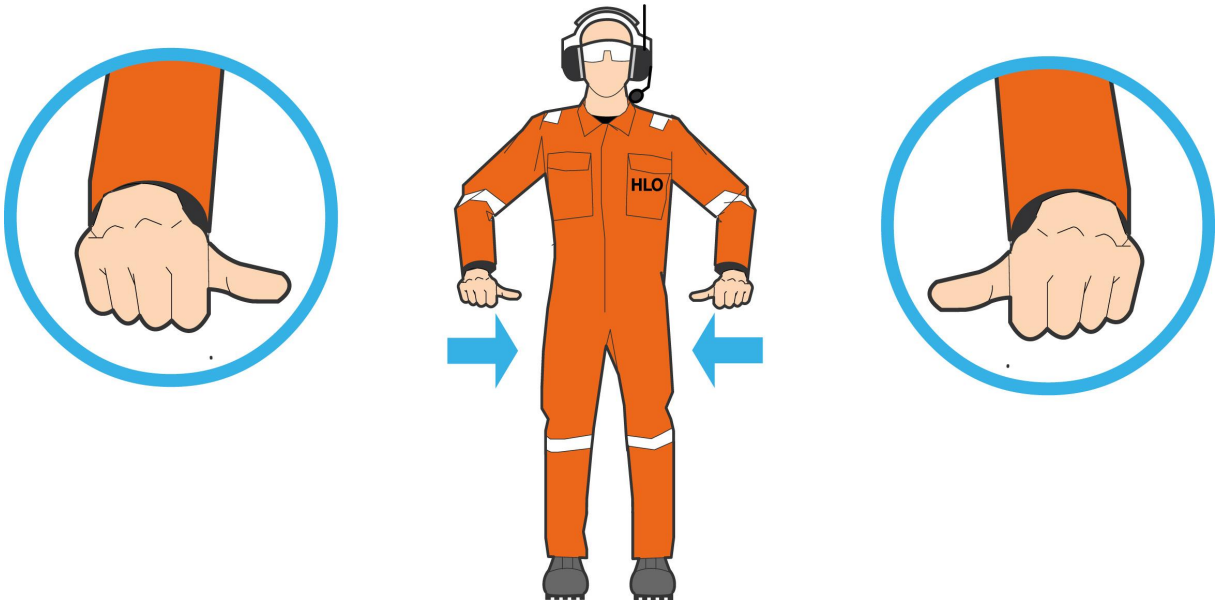
from the parent facility is not established and where the nature of the operation otherwise requires this.

During night flying, the helideck's perimeter lighting, red obstacle lights and general facility lights shall be on.

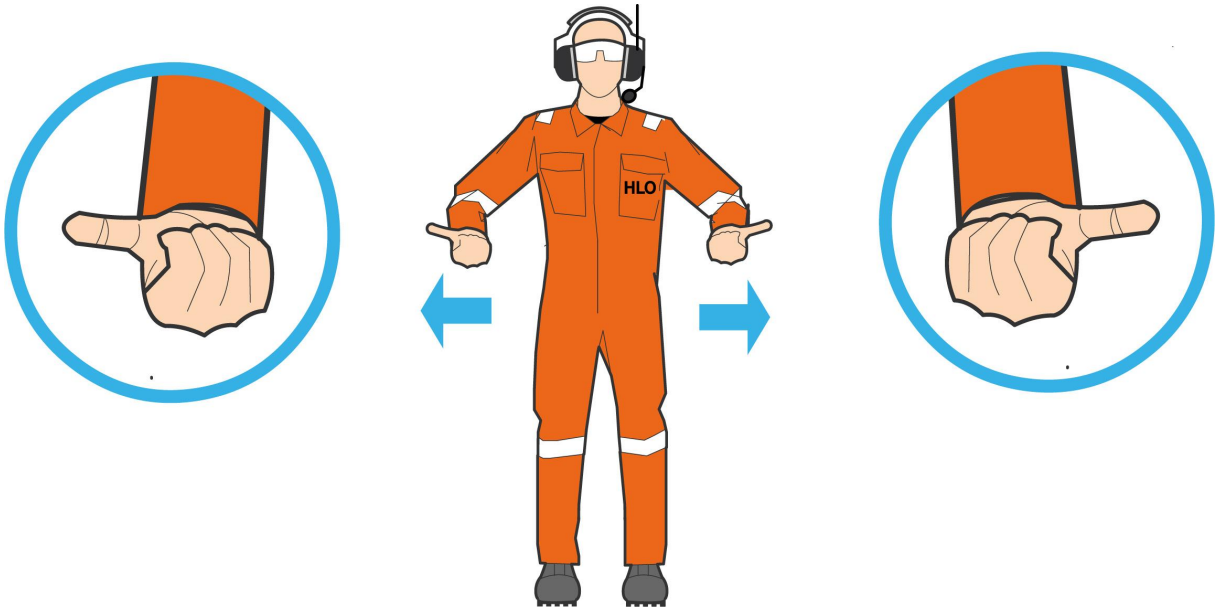
APPENDIX A - HAND SIGNALS

HAND SIGNALS 1 –

Chocks in position

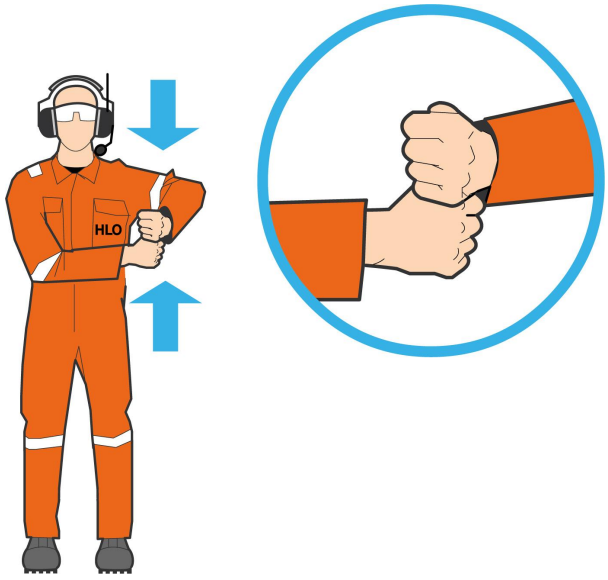


Chocks away

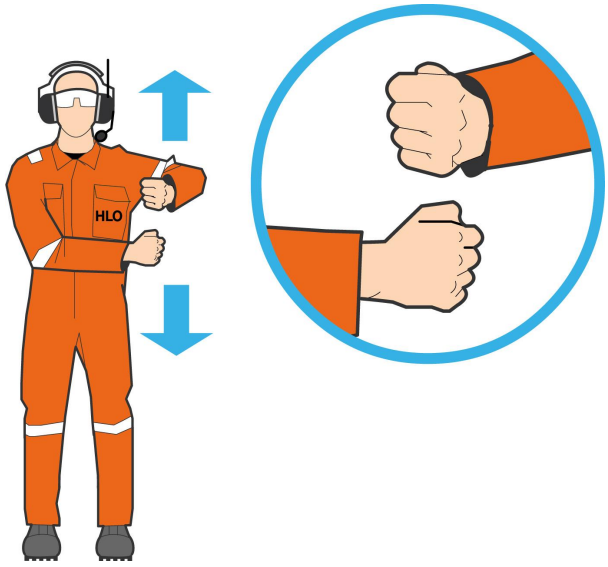


HAND SIGNALS 2

External power on

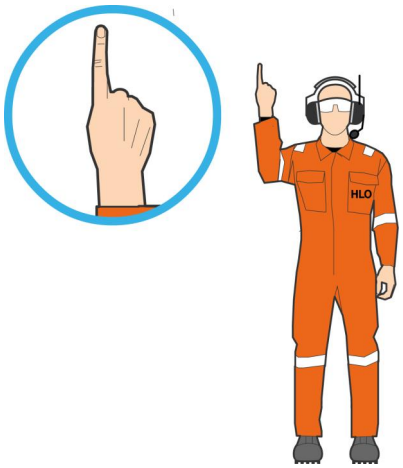


External power off

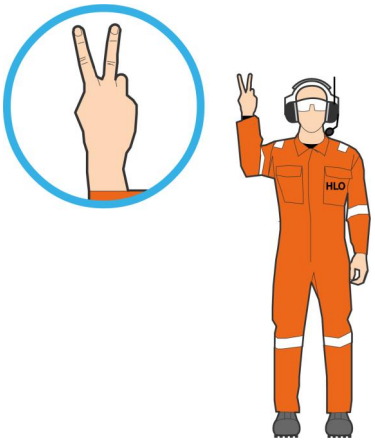


HAND SIGNALS 3

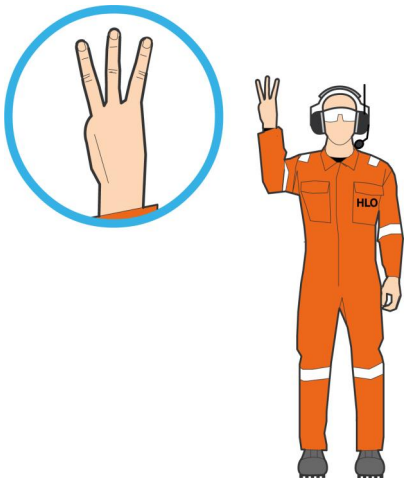
Start engine no 1



Start engine no 2

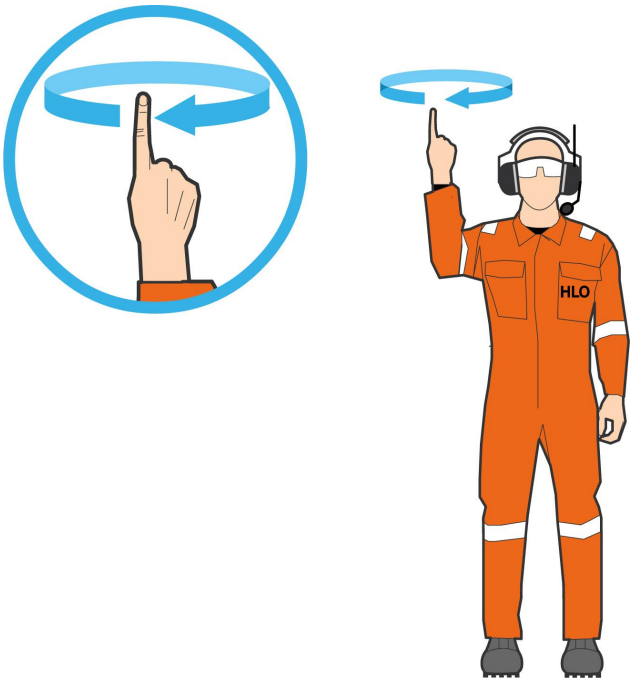


Start APU

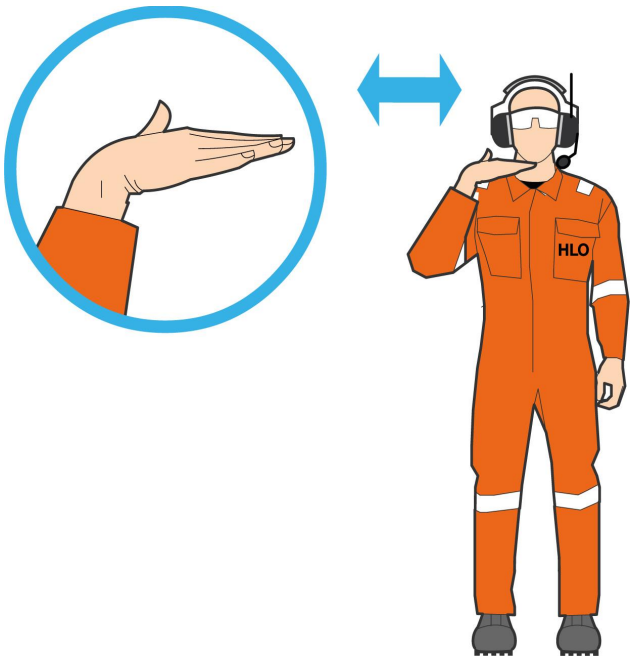


HAND SIGNALS 4

Start rotor

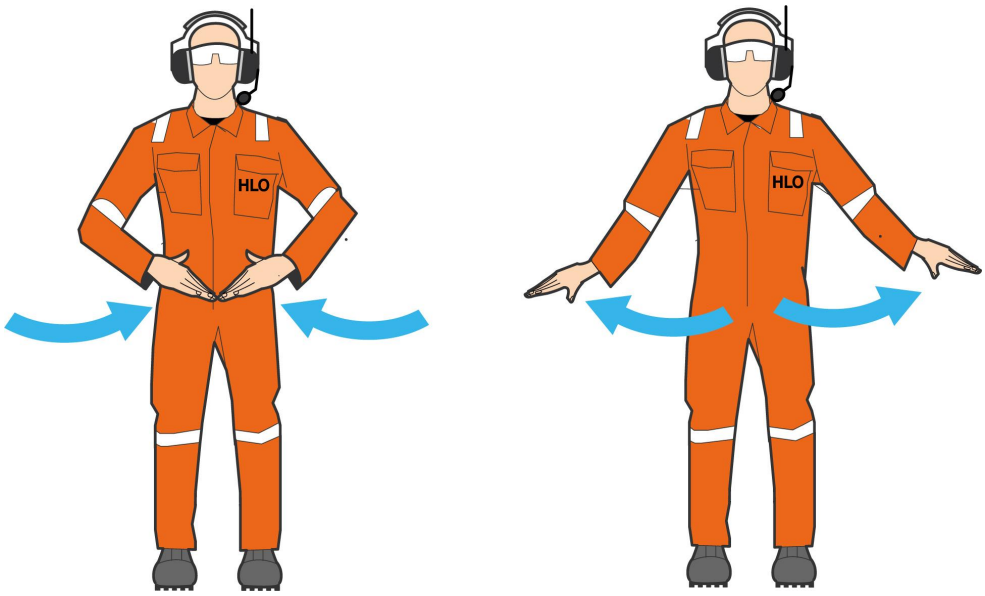


Shut down

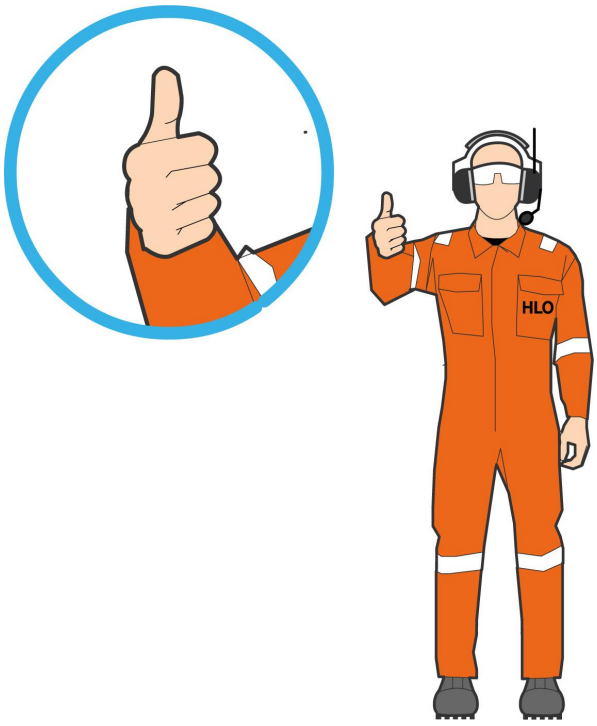


HAND SIGNALS 5

Stop refuelling

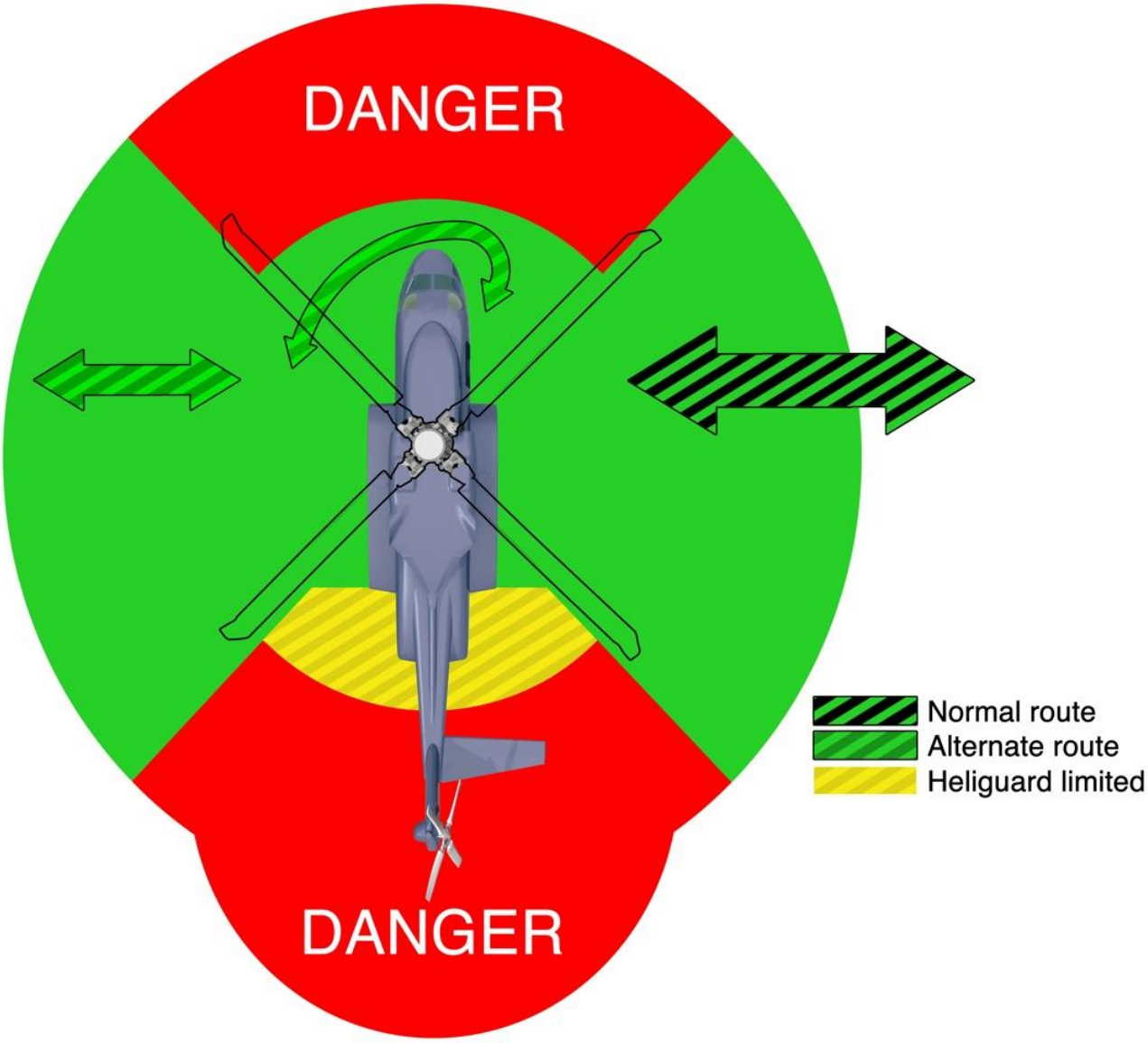


OK



APPENDIX B - HELICOPTER SAFETY ZONES

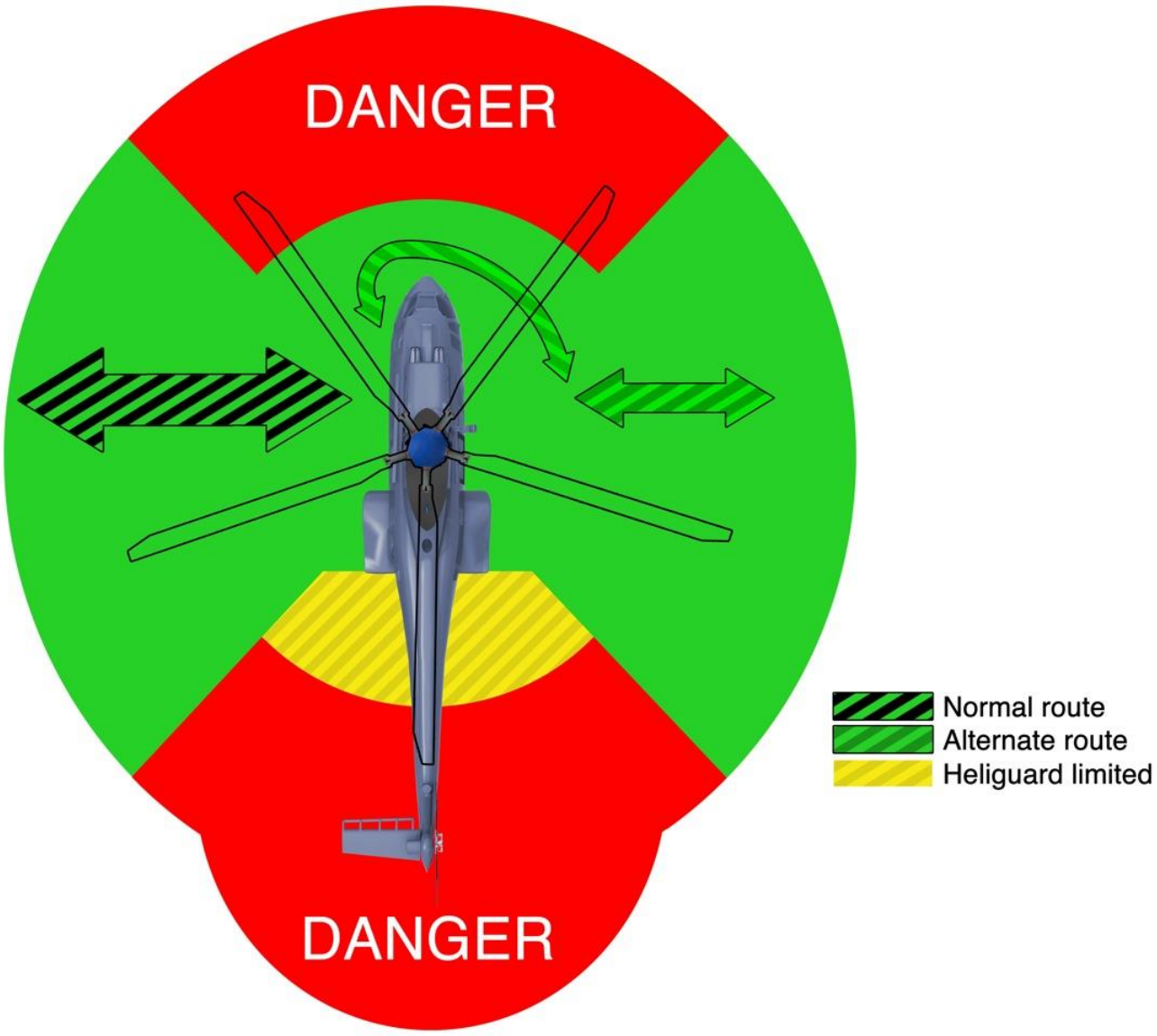
SIKORSKY S-92



Alternate route to be used only under HLO supervision!

See appendix G “alternative access” for procedures.

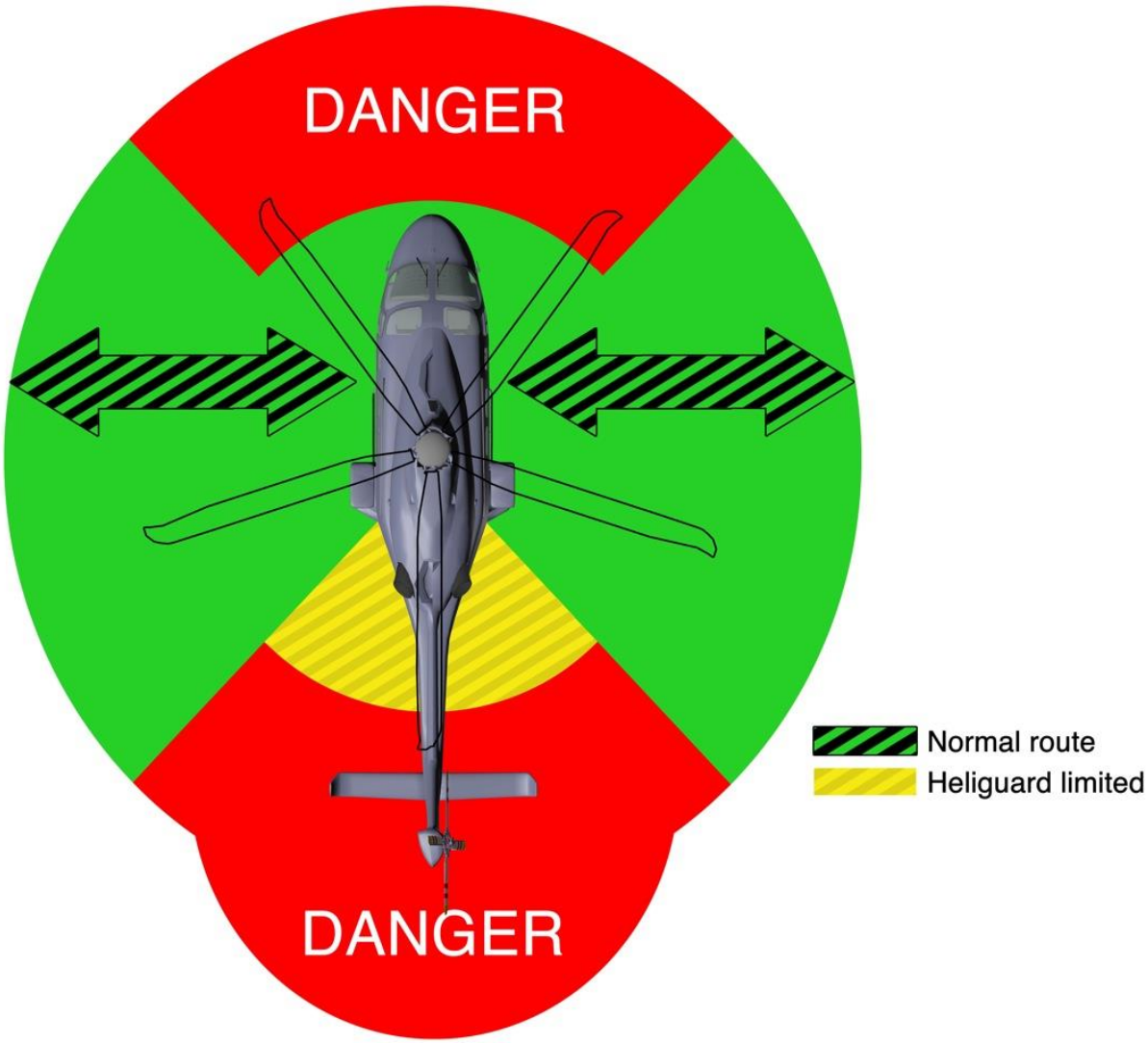
Airbus SuperPuma



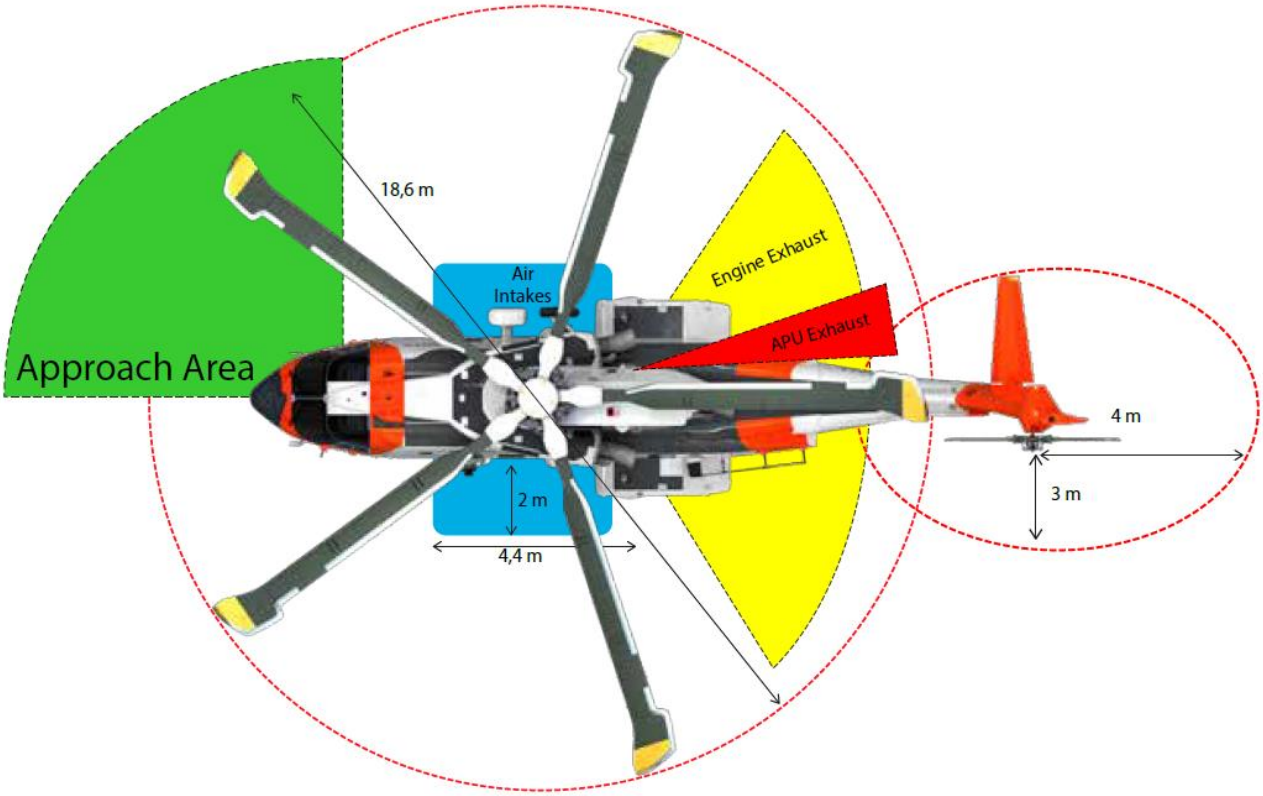
Alternate route to be used only under HLO supervision!

See appendix G “alternative access” for procedures.

Leonardo AW139 & AW189



Leonardo AW101 -SAR Queen



APPENDIX C - FORMS FOR HELICOPTER FUEL

Filter water separator/Dirt Defence / Water Barrier follow-up log

Facility:_____ Year:_____

Name/type, filter water separator _____

Elements type 1 Number _____ Date installed _____

Elements type 2 Number _____ Date installed _____

Name and type Dirt Defence/Water Barrier _____

Elements Number _____ Date installed _____

Functional test differential pressure	
Dirt Defence / Water Barrier	Separator
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Psi Bar

Max 15

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
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4																																																			
2																																																			

Helicopter fuelling log

Rig/facility: Form recipient

Date	Flight no	Heli company	Call sign	Litres filled	Water sample		Pilot's signature	Daily inspection						Total sampling volume per day:	HLO sign
					Before filling	After filling		Water/purity test			Diff pressure filters		Conduct a visual inspection of the plant for damage and leaks		
								Tank OK	Separator OK	Dirt Defence / Water Barrier OK	Dirt Defence / Water Barrier daily	Separator weekly*			

Hose inspection and test journal

Manufacturer:_____ Hose identification no.:_____

Hose type:_____ Length:_____

Production date:_____Diameter:_____

Hose with connector: Factory-installed ϒ Locally installed ϒ (check one)

Date in service from: :_____ Location:_____

Test date	Monthly	Test result	Signature

Use one sheet for each hose in service or in storage.

Transport log helicopter fuel Jet A-1

Facility/vessel										**Year**			
Receipt of transport tank										**Return of transport tank**			
Date	Transport certificate no	Tank no	Seals OK?	Drainage samples			Volume received		Sign	Date	Returned fuel volume	Sealed	Sign
				Free of water		Particles	From certificate	Measured					
				Visual	Detector								

APPENDIX D - PHRASEOLOGY

Specific words and phrases - known as standard phraseology - are used for radio communication in the aviation sector to achieve easier understanding. Making the greatest possible use of this phraseology is recommended.
A list of standard English expressions with an explanation in Norwegian is provided below.

ABORT LANDING/TAKEOFF	Avbryt landing eller avgang. Gjentas 3 ganger dersom en farlig situasjon oppdages.
ACKNOWLEDGE	Bekreft at min melding er mottatt og forstått
AFFIRM	Ja, eller tillatt
APPROVED	Godkjent
BREAK	Indikerer skille mellom meldinger
CANCEL	Annuller siste utsendte klarering
CONFIRM	Bekreft
CORRECTION	Rettelse, jeg har sagt noe feil….
DECK IS CLEAR	Dekket er klart for landing
DISREGARD	Glem, se bort fra
GO AHEAD	Begynn
HOW DO YOU READ	Hvordan hører du meg
I SAY AGAIN	Jeg gjentar
MONITOR	Lytt på frekvensen
NEGATIVE	Nei, ikke tillatt, feil
PASS YOUR MESSAGE	Kom med din melding
READ BACK	Repeter alt eller deler av sendingen
ROGER	Jeg har mottatt meldingen (ikke som svar)
SAY AGAIN	Gjenta alt eller deler av sendingen
SPEAK SLOWER	Snakk langsommere
STANDBY	Vent
VERIFY	Undersøk og bekreft
WILCO	Jeg har forstått og vil handle deretter

APPENDIX E1 – AIRBUS AS332L/L1 SUPER PUMA

Technical data:

- Max length 18.70 metres
- Max width 15.60 metres
- Height 4.95 metres
- Max departure weight 8600 kilos
- Speed 150 knots
- Fuel capacity 1870 kg (2367 litres)
- Crew 2
- Passengers 19
- Engine type Makila 1A/1
- Engine power 1820 HP

General description:

The Airbus AS332L/L1 Super Puma is a twin-engine helicopter with two Makila 1A/1 jet engines. The cabin seats 19 passengers and 2 pilots in the cockpit. The entry door is located in the centre of the left side of the fuselage, and access to the cockpit takes place via separate cockpit doors.

The cargo compartment is located in the aft part of the cabin with access via a hatch under the tail boom. It is not possible to enter the cargo compartment via the cabin.

Releasing seat belts

All seats are equipped with 4-point seat belts, and the seat belt can be released by twisting the release wheel toward the left.

Cabin door

- Opening

Open the door by pulling the door handle out and then rotating it toward the open position (Fig. 2). The door will then pop out with the aid of springs. Then push the door forward until it hits the door stop that locks the door in the front position.

- Closing

Close the door by rotating the handle toward the open position (Fig. 2) to release the door from the locked position. Then push the door backward to cover the opening in the fuselage. The door shall be pushed slowly and gently without using force. Then place your hands on the door markings indicating where your hands need to be (Fig. 1). Then push the door into the fuselage and turn the door handle to “Closed” (Fig. 2).

Fig. 1

Fig. 2

Cargo compartment hatch

The cargo compartment on the Airbus AS332L/L1 Super Puma is located in the aft part of the cabin. The compartment can be accessed via a hatch hinged on the underside.

- Open the hatch by rotating the handle in the centre of the cargo compartment hatch toward the open position (Fig. 3). The hatch is hinged on the underside and features steps you can stand on while loading the cargo compartment.

- Close the hatch by lifting it up and simultaneously holding the handle toward the open position. Once the door is inside the threshold, rotate the handle toward the closed position.

Fig. 3

Cargo compartment

The Airbus AS332L/L1 Super Puma has 2 cargo compartments facing the cabin, one above and one below the shelf mounted on the wall against the cabin. There is also a cargo compartment in the back of the tail boom. All three cargo compartments are accessed via the hatch under the tail boom.

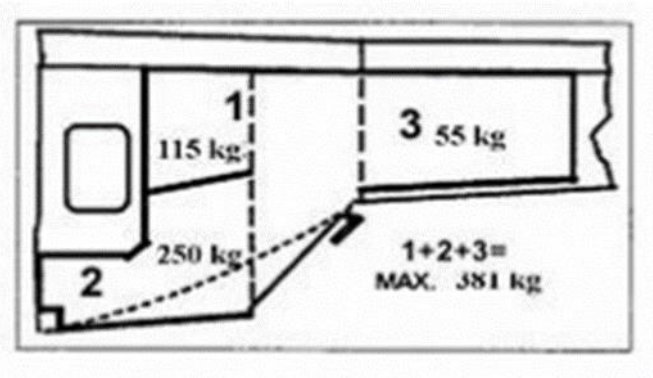
- The cargo compartments have the following cargo compartment restrictions:

o Shelf cargo compartment 1, 115 kg.

o Shelf cargo compartment 2, 250 kg.

o Tail boom cargo compartment 3, 55 kg.

o Total weight in all compartments cannot exceed 381 kg.



Emergency exits

The Airbus AS332L/L1 Super Puma has 6 emergency exits; 4 emergency exits in the cabin and 2 emergency exits in the cockpit. In the cabin, the two front windows and both doors located in the centre of the fuselage are emergency exits. In the cockpit, the cockpit doors are emergency exits.

- Cabin emergency exits

Open by pulling the “triangle” ring in front of the sliding door (Fig. 6). The door will then pop out and fall down.

- Cockpit emergency exits

Open by rotating the release handle located in the middle between the hinges on the cockpit door upward (Fig.4). The door will then be pushed out by springs, making it possible to remove the door manually.

Fig. 4

Refuelling

The Airbus AS332L/L1 Super Puma is equipped with seven fuel tanks located under the cabin floor. These tanks hold 2367 litres of fuel and can be filled with a normal pistol grip nozzle (gravity) in every tank or pressurised pistol grip nozzle (single point). If the normal pistol grip nozzle is used, each tank will need to be filled individually. The fuel filling lids are located at the front and behind the right cabin door (Fig. 6). The earthing

point is located in immediate proximity of the refuelling points. If a pressurised pistol grip nozzle is used, this will take place in the refuelling point behind the left “sponson” (Fig. 5). The earthing point is located in immediate proximity of the refuelling point.

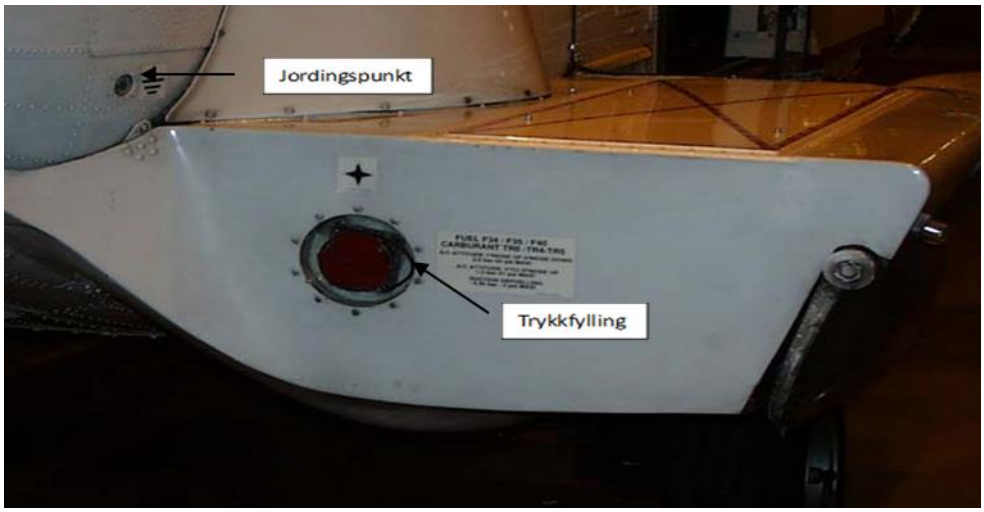


Fig. 5

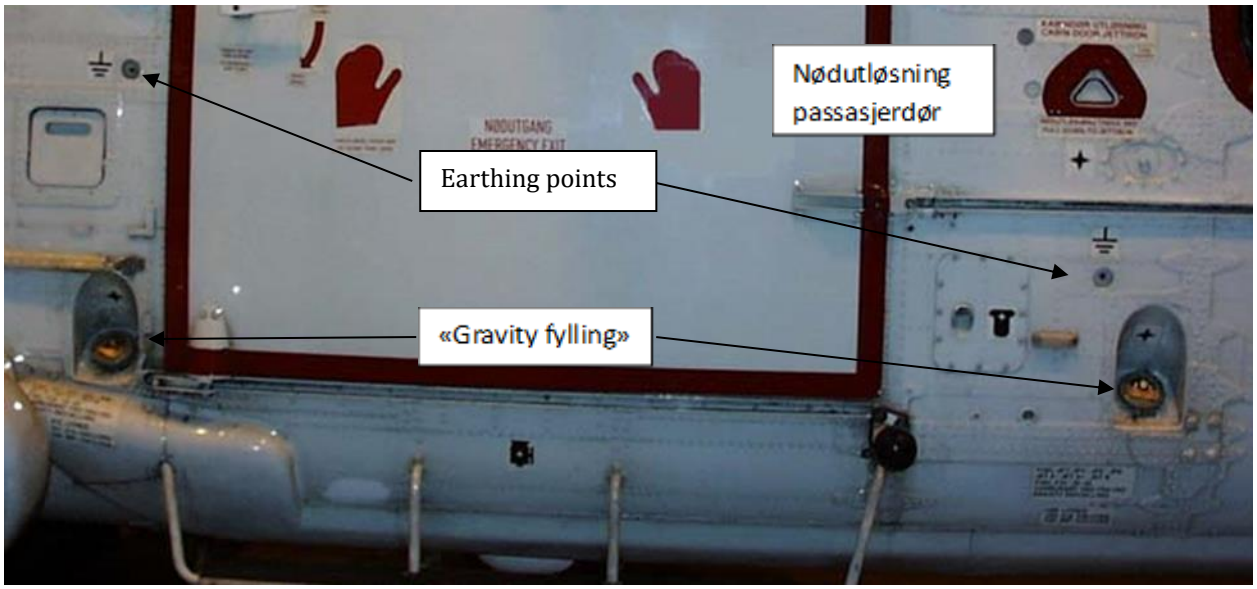


Fig. 6

Fire fighting

The Airbus AS332L/L1 Super Puma features fire-fighting systems to extinguish engine fires. There are no openings that can be reached by external fire-fighting.

APPENDIX E2 – LEONARDO AW101 SAR QUEEN

Technical data:

- Max length 22.83 metres
- Max width (rotor) 18.60 metres
- Height 6.65 metres
- Max take-off weight 15,600 kg
- Speed 149 knots
- Fuel capacity 4,160 kg / 5,200 litres
- Crew 6
- Passengers 20 distressed (See general description)
- Engine type GE CT7-8E
- Engine power 3 x 2,500 HP

General description:

The Leonardo AW101 SAR Queen rescue helicopter has three GE CT7-8E jet engines and is equipped with e.g. two rescue lifts. In the standard SAR configuration, there are 6 seats reserved for crew, as well as 5 seats for passengers. All seats are equipped with 5-point (crew) / 4-point (pax) seat belts. The seat belt can be released by turning the release wheel.
One entry door is located in the forward part of the left side of the fuselage, right behind the cockpit, but the aft loading ramp is generally used for boarding. The sliding door (cargo door) on the right side of the fuselage is used during lift operations.
The Leonardo AW101 SAR Queen is not configured with a cargo compartment.

Emergency exits:

- All doors and windows can be opened in an emergency (Fig. 1, 3 and 4). All emergency exits can be opened from both the inside and outside. Due to fuel lines

in the fuselage, we do not recommend cutting through the fuselage. The back left window is blocked by medical equipment inside (Fig. 3).

- Ramp: The ramp is hydraulic, but can also be opened manually by pulling the handle behind the hatch labelled “MECHANICAL RAMP RELEASE”, aft right side of the fuselage (Fig. 2).

Fig. 1

Fig. 2

Fig. 3

Åpne nødutgang i dør, høyre side

Nødutgang dør venstre side

Åpning av nødutgang vinduer

Åpning i nødutganger ved piloter

Fig. 4

Refuelling

- The Leonardo AW101 SAR Queen is equipped with 5 fuel tanks. 3 main tanks, each supplying fuel to one engine, as well as 2 "transfer tanks" that top off the main tanks as fuel is consumed. Main tank no. 2 also fuels the APU.
- Earthing points are located in immediate proximity of refuelling points.

- Each tank can be filled with up to 832/808kg of pressure/gravity refuel.
- Pressure refuel is filled via the single point on the right side of the fuselage (Fig. 5).
- Gravity refuel is filled via 4 points on the left side (Fig. 6).

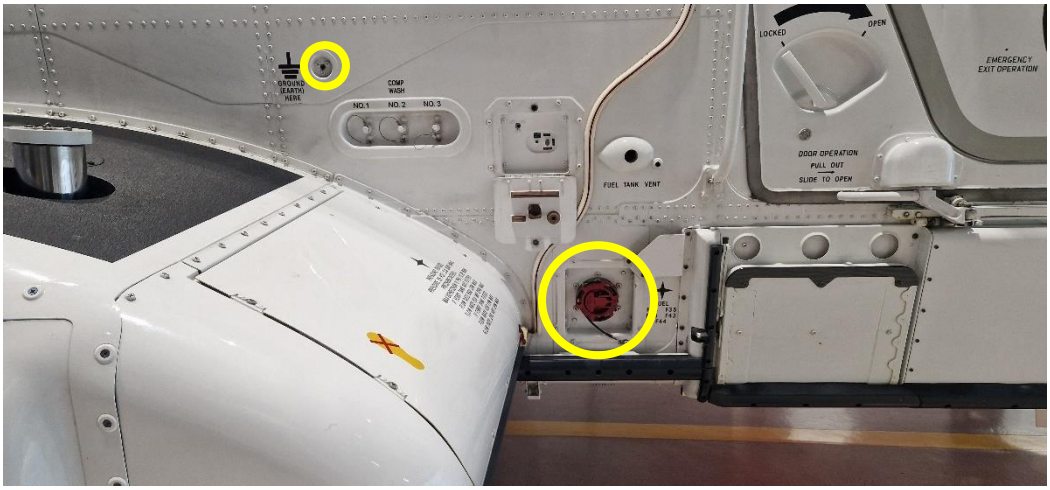


Fig. 5 Pressure refuelling point

Fig. 6 Gravity refuelling point

Engine fire and fire extinguishing hatches

All engine cowlings have extinguishing hatches for use in the event of an engine fire (Fig. 7). Fire suppression agents shall be aimed at these hatches to effectively flush the engine compartment.
The Leonardo AW101 SAR Queen is equipped with an automatic fire suppression system in the engine compartment. Fires are detected from heat or flames. Each engine and APU is compartmented in a separate fire zone. If a fire is indicated, the pilots can activate the system from the “overhead panel”.
The fire suppression liquid (HFC-125) is colourless, odourless, non-corrosive and leaves no residue. It becomes a hazardous substance after decomposing at high temperatures.

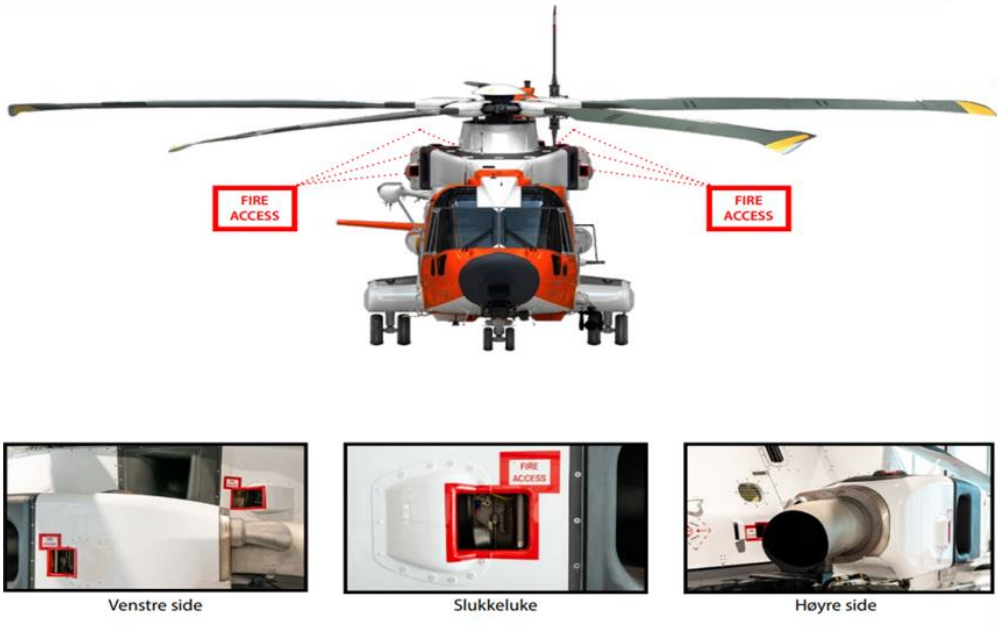


Fig. 7

Internal fire fighting

The Leonardo AW101 SAR Queen is equipped with two 1.5kg fire extinguishers (halon) that can be operated by the crew on board. One unit is located in the cabin, above a window on the left side (Fig. 8). The other is located in the cockpit, behind the "interseat console" (Fig. 9).

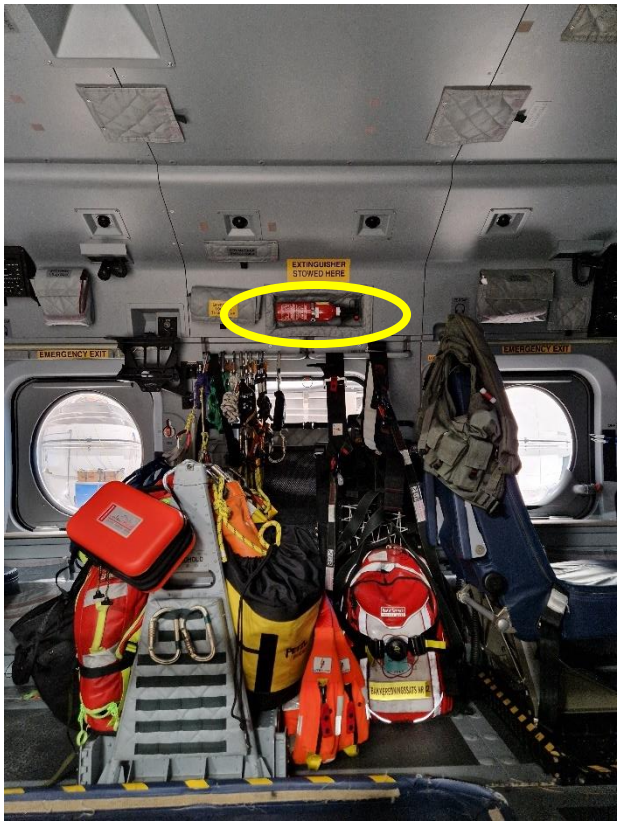


Fig. 8

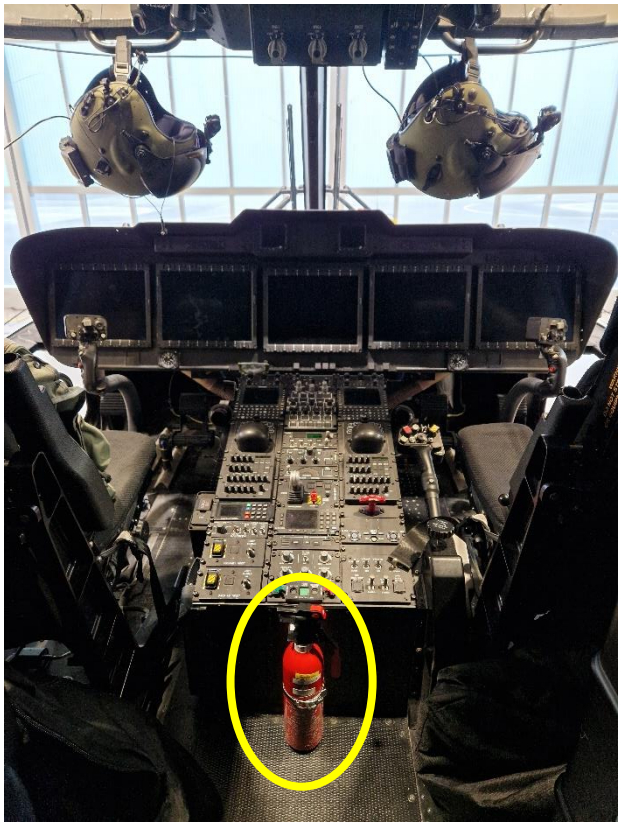


Fig. 9

APPENDIX E3 - SIKORSKY S-92

Technical data:

- Max length 20.88 metres
- Max width 17.17 metres
- Height 5.47 metres
- Max take-off weight 12,020 kilos
- Speed 135 knots
- Fuel capacity 2340 kg (2960 litres)
- Crew 2
- Passengers 19
- Engine type GE CT7
- Engine power 2043 HP

General description:

The Sikorsky S-92A is a twin-engine helicopter with two GE CT7 jet engines. The cabin seats 19 passengers and 2 pilots in the cockpit. The entry door is located right behind the cockpit on the right side and the cockpit is accessed via the cabin.
The cargo compartment is located in the aft part of the cabin with access via a hatch and hydraulic ramp under the tail boom. It is not possible to enter the cargo compartment via the cabin.
The helicopter is equipped with an APU turbine that can supply the helicopter with electricity and hydraulic pressure when the engines and rotors are idle.

Releasing seat belts

All seats are equipped with 4-point seat belts, and the seat belt can be released by twisting the release wheel toward the left.

Cabin door

The Sikorsky S-92A can be delivered with three alternative entry doors; a "clam shell"-type and two variants where the upper part or entire door is a sliding door.

- "Clam shell" door
  - Opening

    Open the door by rotating the handle on the top door panel to the open position. The door will then tilt up with the aid of two gas cylinders (Fig. 1). Secure the door in the open position by locking the gas cylinders. This is done by operating a locking handle located on the cylinders. Then open the lower door by rotating the handle to the open position and carefully pulling the door, so it can glide out. A gas cylinder will control the door's speed (Fig. 2).

  - Closing

    Close the door by starting to lift the lower door panel and holding the handle toward the open position as the door is seated in the frame, and then turn the handle to the closed position. Close the top door panel by unlocking the gas cylinders using the locking tab on the gas cylinder. Pull the door down and hold the handle toward the open position until the door slides into the frame. Then rotate the handle toward the closed position.

Fig. 1

Fig. 2

- Sliding door
  - Opening

    Open the door by rotating the handle on the top door panel (Fig. 3) to the open position. The door will then pop out of the fuselage, and you will be able to push the door back. Push the door back by pushing from the front;

do not push the door back using the handle. Then open the lower door by rotating the handle to the open position and carefully pushing the door, so it can glide out. A gas cylinder will control the door's speed.
Please note: The top door panel SHALL always be opened before opening/closing the lower door panel.

- Closing
  Close the door by starting to lift the lower door panel and holding the handle toward the open position as the door is seated in the frame, and then turn the handle to the closed position. The top door panel can be closed by pulling the release handle located in lower front edge of the door (Fig. 6). Pull the door forward by pulling it from the front, while simultaneously holding the handle in the open position (Fig. 4). Once the door is 50% closed, place your hands on each side of the window and push the door forward and into the closed position. Check that the door is fully seated in the frame, and then rotate the handle to the closed position.

Fig. 3

Fig.4

- SAR sliding door
  - The SAR version has a solid door panel (Fig. 5), and the door handle and release handle are located at the front of the door (Fig. 6). This, as

opposed to other versions, has an emergency exit with a dedicated release handle recessed in the door. The door handle is located just in front of the emergency exit (Fig. 7). Make sure that you use the correct handle when operating the door.

Fig. 5

Fig. 6

Fig. 7

Cargo compartment door

The cargo compartment on the Sikorsky S-92A is located in the aft part of the cabin. Access to the cargo compartment takes place via a hinged upper door and a hydraulic ramp.

- The door can be opened by pushing a button located near the handle on the upper door (Fig. 8), then the handle will pop out so it can be turned toward the open position. Then lift the door up until it stops. When the door is fully open, rotate the handle toward the closed position, and the door will remain parked in the upper position. The hydraulic ramp can be lowered by operating the spring-loaded button located on a control panel on the right side of the cargo compartment (Fig. 9). Push and hold the button down, and the ramp will lower as long as the button is held down. Ensure that the ramp is not lowered all the way down to the deck. Maintain a minimum clearance of 10 cm to the helideck.
- The hydraulic ramp can be closed by operating the spring-loaded button located on a control panel on the right side of the cargo compartment (Fig. 9). Move the button upward, and the ramp will be lifted for as long as the button is held up. When the ramp is up, the upper door panel can be lowered once the handle is rotated to the open position. Once the door panel is all the way down, rotate the handle to the closed position and push it in, so that the handle is flush with the door.

Fig. 8

Fig. 9

Cargo compartment

The Sikorsky S-92A comes with two variants for how the cargo compartment is outfitted, one where there is a shelf split in half mounted on the cargo compartment wall and a bin split in half mounted on the ramp. The other version has two shelves mounted on the cargo compartment wall. Both shelves are split into two cargo compartments. In order to prevent the luggage from being crushed against the luggage shelf, cargo in the bin shall not be higher than the rod holding the net (Fig. 11).

- The cargo compartment with shelf and bin has the following cargo compartment restrictions:

- Shelf (cargo compartment 1) 68 kg, (cargo compartment 2) 68 kg = 136 kg in total (Fig. 10).
- Bin (cargo compartment 3) 202 kg, (cargo compartment 4) 202 kg = 404 in total (Fig. 10).
- **The total weight in all compartments <u>cannot exceed 404 kg</u>.**

- The cargo compartment with two shelves has the following cargo compartment restrictions:
  - Top shelf (cargo compartment 1) 68 kg, (cargo compartment 2) 68 kg = 136 kg in total (Fig. 12).
  - Bottom shelf (cargo compartment 3) 158.5 kg, (cargo compartment 4) 158.5 kg = 317 kg in total (Fig. 12).
  - **The total weight in all compartments <u>cannot exceed 453 kg</u>**.

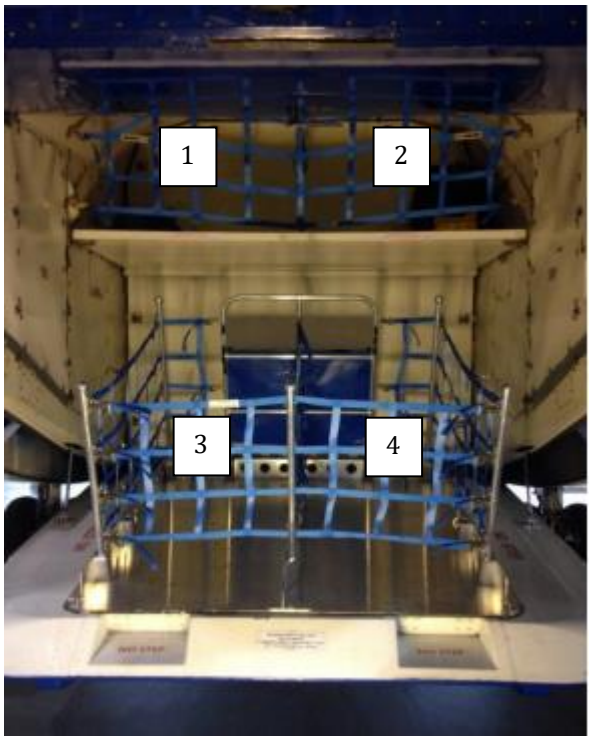


Fig. 10

Fig. 11

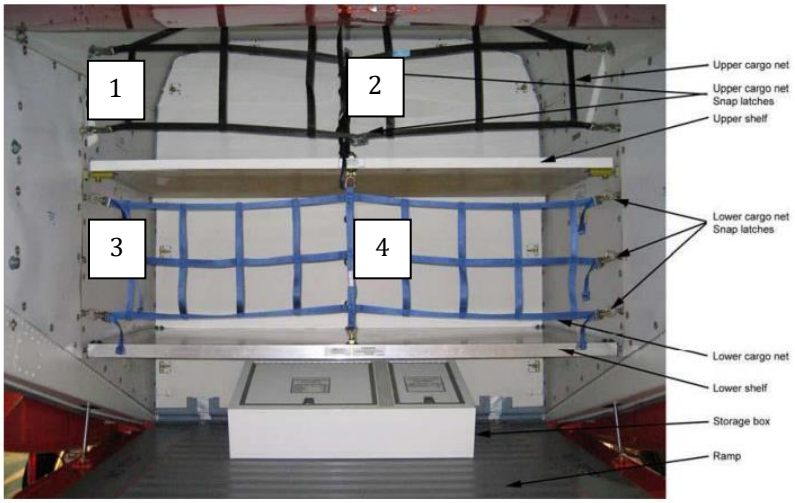


Fig. 12

Emergency exits

The Sikorsky S-92A has 6 emergency exits; 4 emergency exits in the cabin and 2 emergency exits in the cockpit. In the cabin, the two back windows and the front left window are emergency exits, in addition to the upper door panel on the entry door. In the cockpit, the side windows are emergency exits.

- Cabin emergency exits (2 back windows and left front window)
  - They can be opened by rotating the release handle toward open, and then the entire exit panel will detach from the fuselage and fall down.
- Cockpit emergency exits
  - These can be opened by pushing the red button near the release handle, then the handle will pop out so you can rotate the handle toward open. Then the entire exit panel will detach from the fuselage and fall down.

Refuelling

The Sikorsky S-92A is equipped with two fuel tanks located in the "sponsons" on each side of the cabin. They have a capacity of just under 5800 litres of fuel (2900 litres each) and can be filled using the normal pistol grip nozzle (gravity) in each tank or using a pressurised pistol grip nozzle (single point). If the normal pistol grip nozzle is used, each tank shall be filled individually. The fuel filling lids are located at approx. 1/3 of the distance from the leading edge on the "sponsons". If pressure filling is used, both fuel tanks are filled from the left side. The fuel filling lid is located approx. 1/3 of the distance from the leading edge on the "sponson". The earthing point is located on the front part of the "sponson" (Fig. 13 & Fig. 14).

Fig. 13

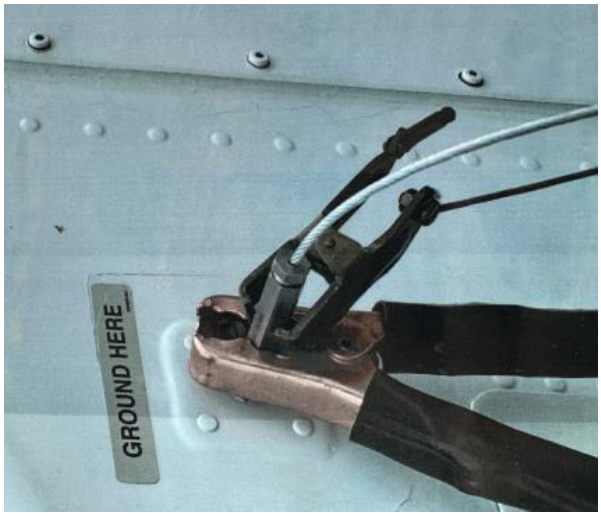


Fig. 14

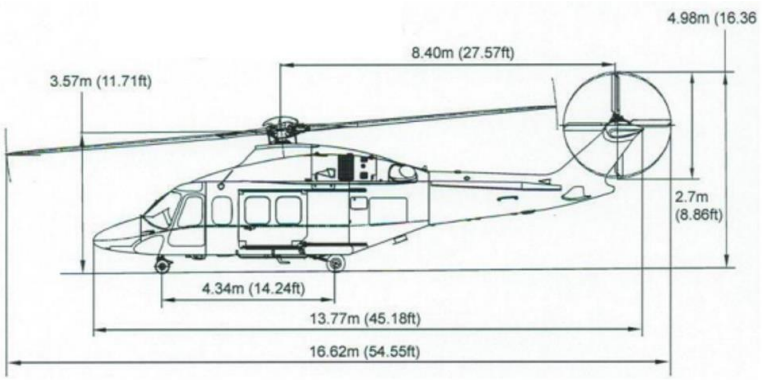
Fire fighting

The Sikorsky S-92A features fire suppression systems to extinguish engine and APU fires. There are no openings that can be accessed using external firefighting.

APPENDIX E4 – LEONARDO AW139

Technical data:

- Max length 16.62 metres
- Max width 13.8 metres
- Height 4.98 metres
- Max take-off weight 7.000 kilos
- Speed 145 knots
- Fuel capacity 1588 litres
- Crew 2
- Passengers 12
- Engine type PW PT6C-67C
- Engine power 1,872 HP



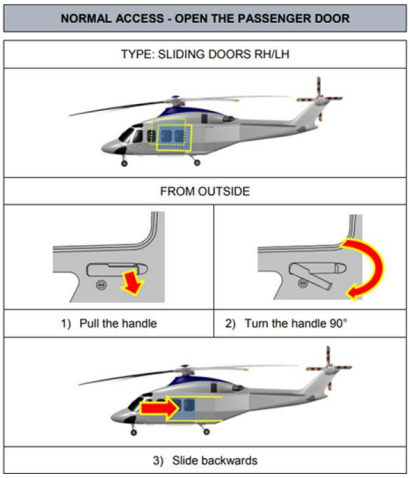
General description

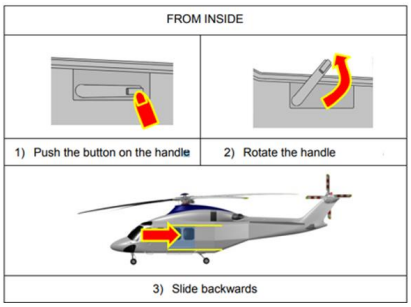
The AW139 is a twin-engine helicopter with two PW PT6C-67C turbine engines. The helicopter seats 12 passengers and normally 2 pilots. The cabin entry doors are located behind the cockpit on the left and right-hand sides. There are 2 separate cockpit doors. The cargo compartment is accessible via doors located on the left and right-hand sides behind the cabin.

Cabin door

The cabin entry doors on the Leonardo AW139 are located behind the cockpit on the left and right-hand sides. Both the right and left doors can be used during disembarking and embarking.

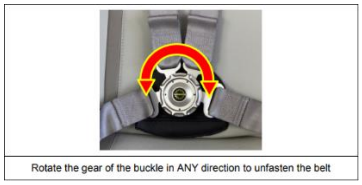
The door can be closed by pushing it forward and moving the handles in the opposite direction of opening.





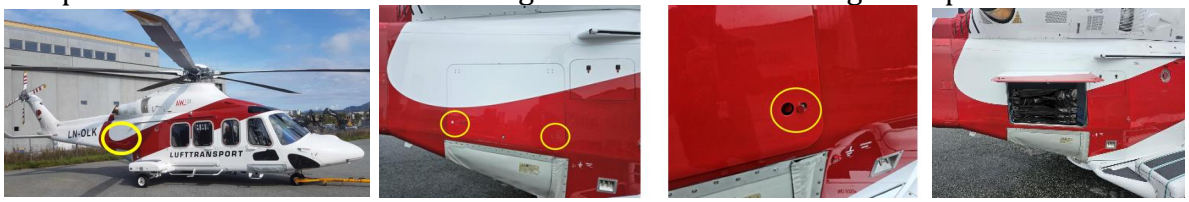
Releasing seat belts

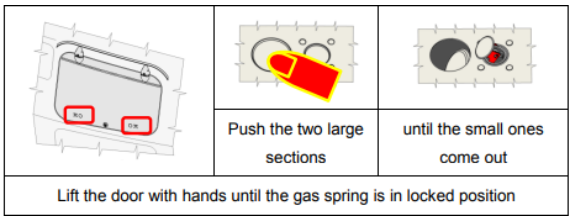
All seats are equipped with 4-point seat belts, and the seat belt can be released by turning the release wheel.



Cargo compartment

The cargo compartment on the Leonardo AW139 is located behind the cabin with access via doors located on the left and right-hand sides. Both cargo compartment doors cannot be open at the same time due to the significant draft in the cargo compartment.



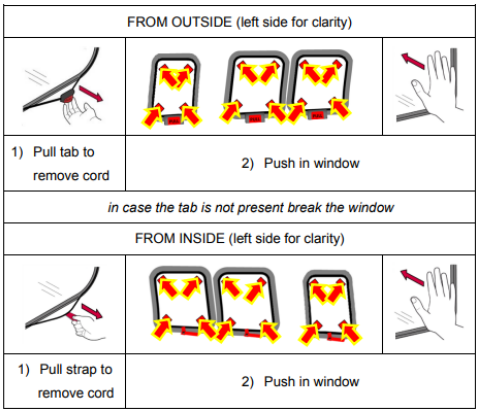


The door can be closed by pulling it downward. Once the door panel is down and snug in the door frame, push in the smallest locking buttons to lock the door.

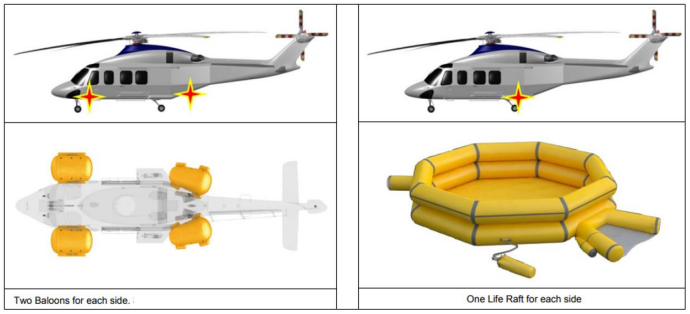
- Maximum 200-300kg in the cargo compartment, depending on model. Maximum 550 kg/m2

Emergency exits and emergency equipment

The Leonardo AW139 has 8 emergency exits; 6 emergency exits in the cabin and 2 emergency exits in the cockpit.
In the cabin, all the windows are emergency exits. In the cockpit, the side windows are emergency exits.
There are 2 fire extinguishers, one in the cabin and one in the cockpit. The first aid kit is in the cockpit.
The Leonardo AW139 features fire suppression systems to extinguish engine fires.



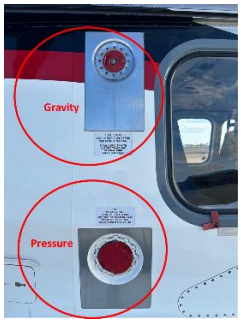
There are 4 flotation devices located on the exterior as shown below. The 2 life rafts are located on the outside behind the cabin doors, one on each side. These are released manually.



Refuelling

The Leonardo AW139 is equipped with fuel tanks located behind the cabin. The tanks have a capacity of 1588 litres of fuel.
The tanks can be filled using the normal pistol grip nozzle (gravity) and a pressurised pistol grip nozzle (pressure fuelling system), depending on the model. The filling points are located on the right side. The top point is for the normal pistol grip nozzle (gravity) and the bottom point is for pressure filling (pressure fuelling system).

The earthing point is located in immediate proximity of the refuelling points. The refuelling plant can be earthed via the labelled earthing point with an earthing plug and earthing clip.


Gravity
Pressure

APPENDIX E5 – AIRBUS H175

Technical data:

- Max length 18.06 metres
- Max width 14.8 metres
- Height 3.48 metres
- Max take-off weight 7800 kilos
- Speed 145 knots
- Fuel capacity 2067 kg (2600 litres)
- Crew 2
- Passengers 16
- Engine type PW PT6
- Engine power 1775 HP

General description

The Airbus H175 is a twin-engine helicopter with two PW PT6 jet engines. The cabin seats 16 passengers and 2 pilots in the cockpit. The entry doors are located directly behind the cockpit on the left and right-hand sides, and the cockpit is accessed via separate cockpit doors.

The cargo compartment is located in the aft part of the cabin, with access via doors located on the left and right-hand sides behind the cabin. It is not possible to enter the cargo compartment via the cabin.

Releasing seat belts

All seats are equipped with 4-point seat belts, and the seat belt can be released by twisting the release wheel toward the left.

Cabin door

The cabin entry doors on the Airbus H175 are located directly behind the cockpit on the left and right-hand sides. Both doors can be used to disembark and embark, but the left-hand door is most appropriate, as the ladder into the cargo compartment is only located on the left-hand side.
Both cabin doors cannot be open at the same time due to the significant draft in the cabin.

- These doors can be opened by pulling out the handle (Fig. 1) to have the door pop out of the fuselage. The door can then be pulled backward until it stops and locks in this position.

Fig. 1

- The doors can be closed by first pulling the handle to release the back locking position, as marked 1 in Fig. 2. Then grab the door handle and push the door forward until it stops in a locked position (Fig. 4). **Please note:** The door shall <u>not be pulled</u> into the locked position (Fig. 3).

- There is an indicator mounted on the door to indicate whether the door is locked (Fig. 5). If the indicator is green, the door is closed; if it is red or half red and half green, the door is unlocked.

Fig. 2

Fig. 3

Fig.4

Fig. 5

Cargo compartment door

On the Airbus H175, the cargo compartment is located in the aft part of the cabin, with access via doors located on the left and right-hand sides behind the cabin. Both sides can be used, but the ladder to access the cargo compartment is only on the left-hand side. Both cargo compartment doors cannot be open at the same time due to the significant draft in the cargo compartment.

- The doors can be opened by pulling out the "D" ring and turning the handle in the direction of the arrow toward "Open". Once the handle is operated, the door will tilt up with the aid of two gas actuators.

Fig. 6

Fig. 7

- The door can be closed by pulling it downward using the grip strap mounted on the inside of the door (Fig. 8). Once the door panel is pulled down and snug in

the door frame, you can turn the door handle in the direction of the arrow toward "Closed" (Fig. 9).

- 

Fig. 8

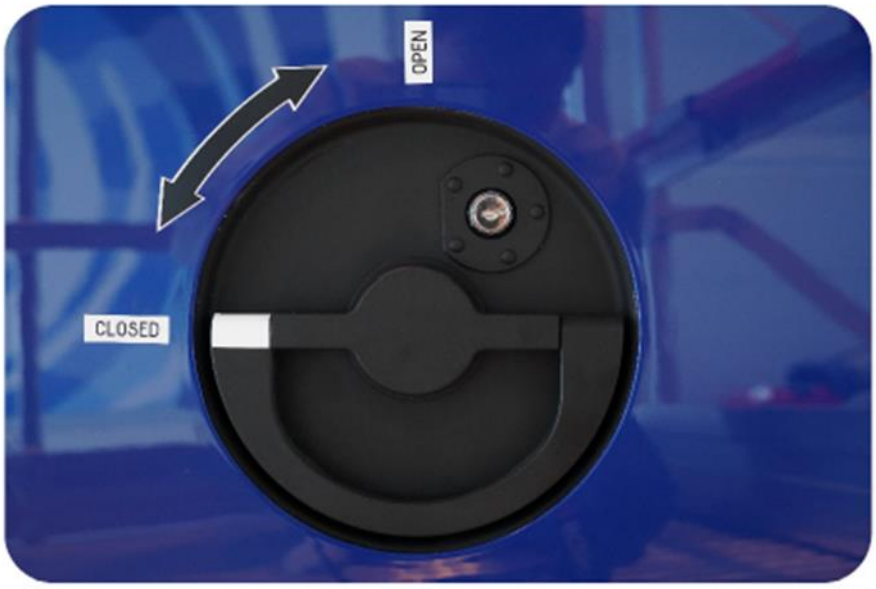


Fig. 9

Cargo compartment ladder

The Airbus H175 has a cargo compartment ladder installed behind the left cargo compartment door. Its sole purpose is to secure access to the cargo compartment (the cargo compartment floor is 1.4 metres above ground). Both feet shall remain on the ladder during loading and offloading, and no one shall climb into the cargo compartment under any circumstance.

- The cargo compartment ladder can be released by pulling the handle marked 1 in Fig. 10 down. Pull the handle marked 2 in Fig. 10 to unfold the cargo compartment ladder. Once the ladder is down, you can unfold the D-shaped handle (Fig 11).

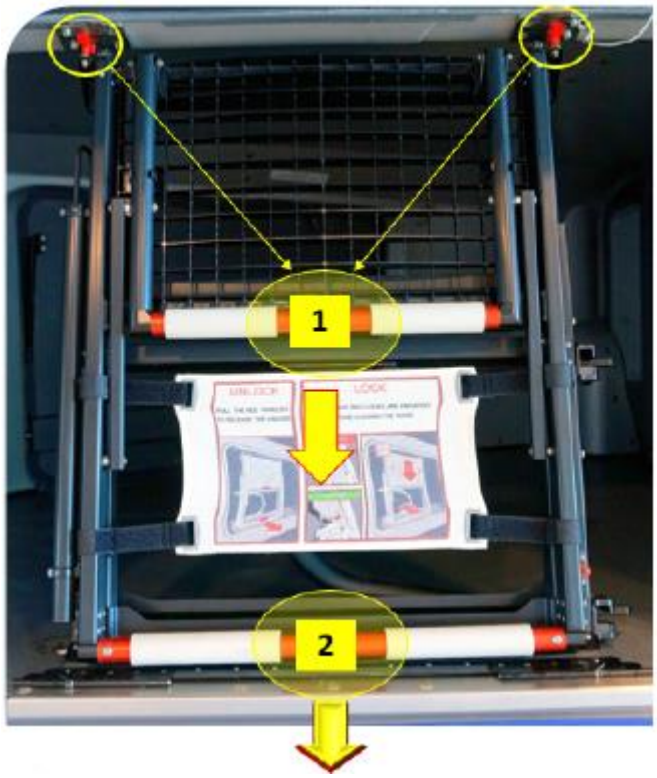


Fig. 10

Fig. 11

- The cargo compartment ladder can be folded and parked by folding in the D-shaped handle (Fig. 12) and then folding the ladder. Once the ladder is fully folded, it can be pushed into the latches (Fig. 13). Ensure that the ladder is fully locked in before closing the door.

Fig. 12

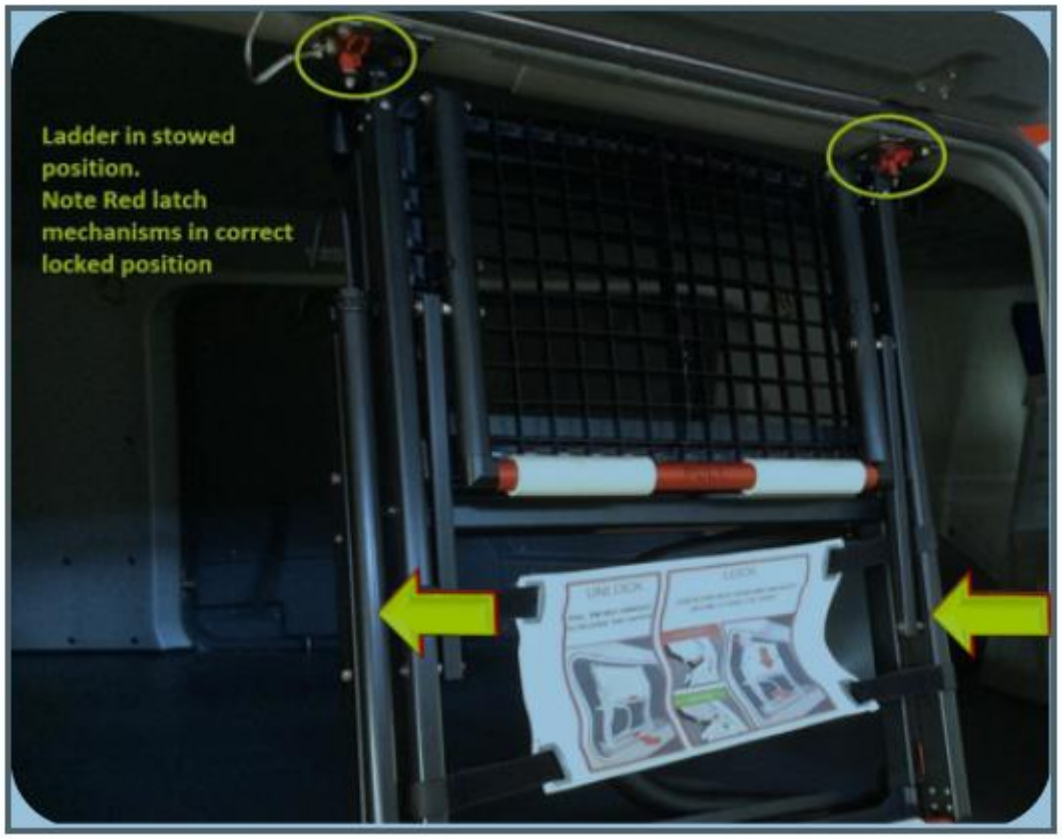


Fig. 13

Cargo compartment

- Maximum 250 kg in the cargo compartment.
- Maximum 160 kg/m2.
- Maximum 120 kg on the cargo compartment ladder.

Emergency exits

The Airbus H175 has 8 emergency exits; 6 emergency exits in the cabin and 2 emergency exits in the cockpit. In the cabin, all the windows are emergency exits. In the cockpit, the cockpit doors are emergency exits.

- Cabin emergency exits
  These can be opened by pulling out the red tape and removing the seal assembly. Then pull the red "tag" to remove the window.
- Cockpit emergency exits
  These can be opened by rotating the red release handle located under the sliding window in the cockpit. Then push the window into the cockpit.

Refuelling

The Airbus H175 is equipped with 4 fuel tanks located under the cabin floor. These tanks hold 2600 litres of fuel and can be filled with a normal pistol grip nozzle (gravity) or a pressurised pistol grip nozzle (single point). The filling points are located on the left-hand side, directly behind the luggage hatch. The top lid is for pressure filling (pressure) and the bottom lid is the normal pistol grip nozzle (gravity) (Fig. 14). The earthing point is located in immediate proximity of the refuelling points. The refuelling plant can be earthed via one of two brackets located directly under the track for the cabin door (Fig. 15).

Fig. 14

Fig. 15

Fire-fighting

The Airbus H175 features fire suppression systems to extinguish engine fires.

APPENDIX E6 –LEONARDO AW189

Technical data:

- Max length 17.6 metres
- Max width 14.6 metres
- Height 3.48 metres
- Max take-off weight 8,600 kilos
- Speed 145 knots
- Fuel capacity 1655kg/2055kg (2063/2600Litre)
- Crew 2
- Passengers 16
- Engine type GE CT7-2E
- Engine power 2104 HP

General description

The Leonardo AW189 is a twin-engine helicopter with two GE CT7-2E1 jet engines. The cabin seats 16 passengers and 2 pilots in the cockpit. The entry doors are located directly behind the cockpit on the left and right-hand sides, and the cockpit is accessed via separate cockpit doors.
The cargo compartment is located in the aft part of the cabin, with access via doors located on the left and right-hand sides behind the cabin. It is not possible to enter the cargo compartment via the cabin.
The standard edition of the Leonardo AW189 is delivered with "Extended Range" features including a larger fuel tank and cargo compartment.
The Leonardo AW189 is also delivered with an external "Cargo Pod" and interior cargo basket to facilitate greater cargo capacity.

Releasing seat belts

All seats are equipped with 4-point seat belts, and the seat belt can be released by turning the release wheel toward the left (Fig. 1).

Fig. 1

Cabin door

The cabin entry doors on the Leonardo AW139 are located behind the cockpit on the left and right-hand sides. Both doors can be used to embark and disembark.

- The cabin door can be opened by turning the handle upward, and the door can then be pushed back until it stops and locks in this position (Fig. 2 and Fig. 3).

Fig. 2 From outside

Fig. 3 From inside

- The door can be closed by first pushing the button inside the door. Then grab the door and push it forward until it stops in a locked position. **Please note:** The door shall be pushed, not pulled into the locked position.
  Then rotate the handle to the locked position (Fig. 2 and Fig. 3).

Cargo compartment door

On the Leonardo AW189, the cargo compartment is located in the aft part of the cabin, with access via doors located on the left and right-hand sides behind the cabin. Both sides can be used, but the ladder to access the cargo compartment is normally only located on the left-hand side.
Both cargo compartment doors cannot be open at the same time due to the significant draft in the cargo compartment.

- The door can be opened by pushing the large locking buttons. Once the buttons are pressed, the door will tilt up with the aid of a gas cylinder (Fig. 4).

Fig. 4

The cargo net can be loosened using tie-down straps (Fig. 5).

Fig. 5

- The door can be closed by pulling it downward. Once the door panel is pulled down and flush with the door frame, you can push the locking buttons to lock the door (Fig. 4 and Fig. 5).

Cargo compartment ladder

The Leonardo AW189 has a cargo compartment ladder installed behind the cargo compartment door. Its sole purpose is to secure access to the cargo compartment (the cargo compartment floor is 1.27 metres above ground). Both feet shall remain on the ladder during loading and offloading, and no one shall climb into the cargo compartment under any circumstance (Fig. 7):

- The cargo compartment ladder can be deployed by pushing the release button at the top of the ladder (Fig.6).

Fig. 6

Fig. 7

- The cargo compartment ladder can be folded and parked by folding up the ladder and locking it before closing the door. Ensure that the ladder is fully locked in before closing the door.

Cargo compartment

- Maximum 280-460kg in the cargo compartment, depending on model.
- Maximum 550 kg/m2

Cargo Pod is shown in Figure 8.

Fig. 8

The Cargo Pod can be attached and removed between trips and has a capacity of 110kg/0.6m3.

Emergency exits

The Leonardo AW189 has 10 emergency exits; 8 emergency exits in the cabin and 2 emergency exits in the cockpit; see Fig. 9. In the cabin, all the windows are emergency exits. In the cockpit, the side windows are emergency exits.

Fig. 9

- Cabin emergency exits

These can be opened by pulling the red strap and pushing out the window (Fig. 10).

Fig. 10

Cockpit emergency exit

These can be opened by pulling the red strap and pushing out the window (Fig. 11).

Fig. 11

Refuelling
The Leonardo AW189 is equipped with fuel tanks located behind and under the cabin. These tanks hold 2063-2600 litres of fuel, depending on the model.
The tanks can be filled with the normal pistol grip nozzle (gravity) or a pressurised pistol grip nozzle (single point). The filling points are located on both sides directly behind the luggage door, and the pressure filling point is located on the right-hand side. The bottom lid is for pressure filling (pressure) and the top lid is for the normal pistol grip nozzle (gravity)(Fig. 12). The earthing point is located in immediate proximity of the refuelling points. The refuelling plant can be earthed via the labelled earthing point and earthing clip (Fig. 13).

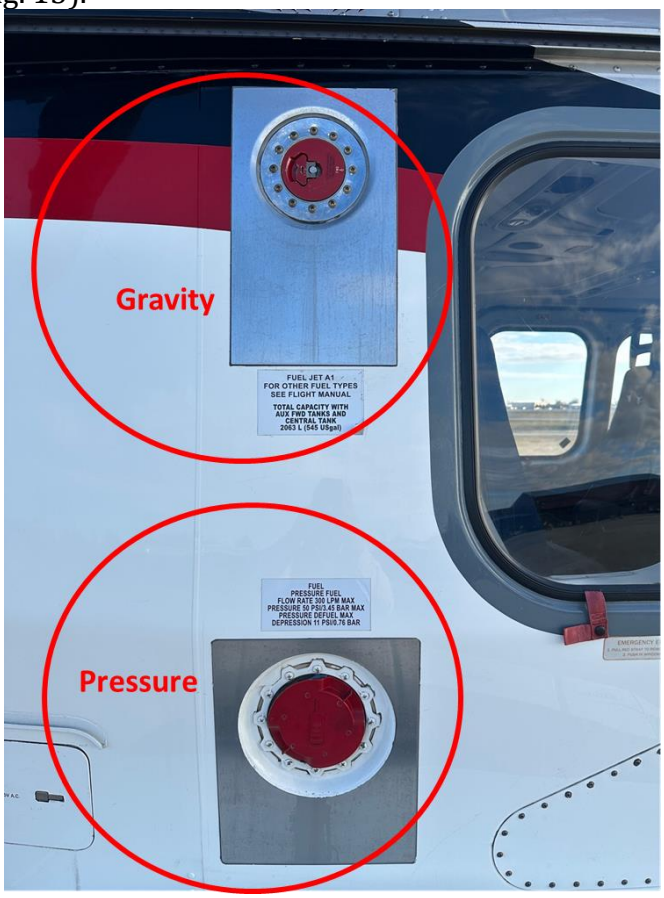


Fig. 12

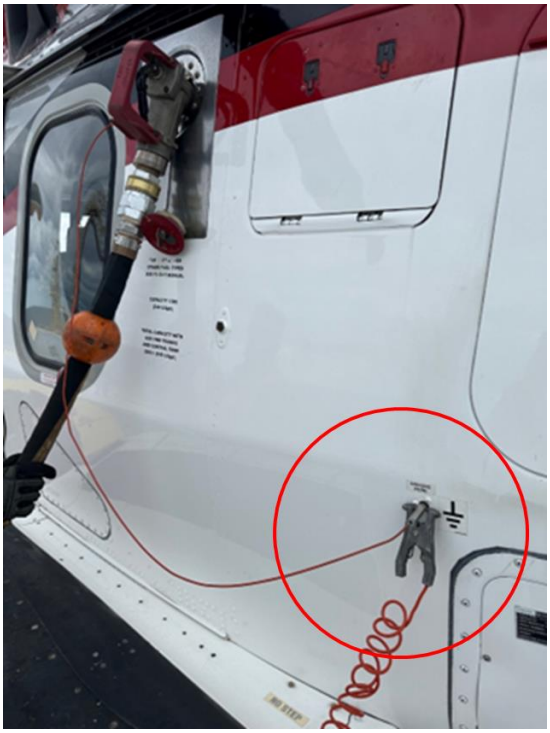


Fig. 13

Firefighting

The Leonardo AW189 features fire suppression systems to extinguish engine fires.

APPENDIX F - HANDLING THE HELICOPTER DURING TAKE-OFF AND LANDING

This appendix provides a step-by-step description of the most common operations on the helideck for a crew of three:

- Helicopter landing officer (HLO).
- Heliguard.
- Fireguard.

The HLO is in charge of the heliguard and fireguard. The division of duties between heliguard and fireguard is tailored to local conditions to ensure safe and efficient operation. Other duties may be assigned as and when required.
During the period the helideck is staffed (from 20 minutes before landing to 10 minutes after take-off), the HLO shall have no other duties.).

Operations are described on the assumption that exit stairs from the helideck exist. On facilities where these are not available, approved alternative exit routes are used.

This procedure builds on the principle of seeking to achieve optimal safety through standardisation across the companies on the NCS and through freeing the HLO from as many assignments as possible.

The helicopter companies specify that, during helicopter operations, the HLO shall have a full overview of the helideck area, be in visual contact with the pilot, and be able to manage/control the operations in such a way that potential dangers are effectively detected and eliminated.

If the HLO needs to leave his post for any reason beyond what is specified in the procedures, this shall be agreed with the pilot.

The time where the cabin door is open shall be kept to a minimum to reduce noise exposure, in addition to not leaving it open unnecessarily, thereby providing calm for the crew to prepare for take-off.

Helicopter arrival

From: the HLO is informed by the radio operator/communication officer that a helicopter is expected.

Until: the helicopter is standing still on the deck with the rotor in motion and the chocks in place.

Operation: well before the helicopter's expected arrival

HLO	HELIGUARD AND FIREGUARD
1. Verifies helicopter time of arrival 30 min before the notified time. 2. Musters on the helideck at least 20 min before arrival. 3. Verifies that any standby vessel in the vicinity is informed of the helicopter's arrival, and that no vessels are within 500 metres in the 180° zone or, if higher than the helideck, the 210° zone. 4. Informs the helicopter of possible vessels within 1000 metres. Vessels located in the approach sector, even beyond 1000m, could complicate an approach and should be mentioned, if possible. 5. Obtains information on the arriving helicopter, including estimated time of arrival, scope and location of cargo, number of passengers and possible fuel requirements. In the event of difficult weather conditions/special cargoes, assesses the need to requisition extra personnel. 6. Reports all known or unknown drone observations to the pilots. 7. Ensures that the current daily inspection of helideck and refuelling plant has been completed, with satisfactory results. 8. Furthermore, checks that the helicopter's landing area is cleared of obstacles and loose objects. 9. Checks that any railings near the stairs are lowered. 10. Briefs heliguard and fireguard, and possibly assigns duties to them.	1. Musters at least 15 minutes before arrival. 2. Prepares cargo for dispatch. 3. Checks and prepares fire-fighting equipment. 4. Receives the manifest and information about the number of arriving and departing passengers, if relevant. • **Please note:** Check the number of XBR pax on the manifest against the number of pax with XBR bands, and plan for XBR passengers entering the helicopter first. 5. Put on required equipment and portable VHF.

Operation: five minutes before the helicopter's expected arrival

HLO	HELIGUARD	FIREGUARD
1. Ensures crane operators are informed. 2. Extinguishes floodlights. 3. Monitors radio communication between helicopter pilot and facility (possibly the helicopter flight information service - AFIS). 4. Ensures that the passengers are ready and waiting in a secure zone without access to the helideck. Physical barriers to be used.		1. Ensures that the fire monitors are aimed and adjusted.

Operation: immediately before helicopter lands and during landing

HLO	HELIGUARD	FIREGUARD
1. Ensures that all the cranes have ceased operation. Crane operations outside the approach/departure sectors may be approved, but the pilot shall be informed well before landing/take-off. 2. Informs the pilots, via VHF radio, that the helideck is cleared for landing and, if relevant, communicates the following: • "Red deck". • Wind direction changes of more than 30°. • Facility direction change of more than 10°. • Sea spray, if this has been observed on/over the helideck. • Other significant changes or factors that could reduce safety. 3. Takes a safe and suitable position with an overview of the helideck. When posted outside the helishack, you should primarily be on the weather side. **Please note:** Check that the landing gear is down. 4. Monitors continuously, and reports possible abnormal conditions immediately.	1. Stands in a safe position in visual contact with the HLO.	1. Stands near the fire post on the weather side, alternatively by the remote-control unit. Maintain full emergency preparedness with the alarm system switch within reach.

Operation: after landing

HLO	HELIGUARD	FIREGUARD
1. After the anti-collision lights have been switched off, signals the heliguard that entry to the helideck is now permitted. 2. Can take a set of chocks and position these on the main wheels, and can receive/deliver the manifest from/to the pilot. 3. Switches on floodlights, if necessary. 4. Takes up a position within the safe rotor zone which ensures eye contact with the pilot and provides a full overview of the helideck.	1. At the HLO's signal, brings chocks, enters the helideck and positions these on the main wheels (chocks shall be placed on both sides).	1. Remains at the fire post until the chocks have been put in position on both sides.

Helicopter on the helideck

From: the helicopter is standing still on the deck with the rotor in motion and the chocks in place

Until: loading the helicopter with passengers and cargo has been completed and the helideck is cleared.

Operation: disembarking and unloading

HLO	HELIGUARD AND FIREGUARD
1. Remains in the best position for eye contact with the pilot and for maintaining a full overview of the helideck. 2. While the helicopter has its rotor engaged, all personnel movement will primarily take place at a 90° angle to the helicopter's longitudinal axis and then outside the rotor disc. See Appendix B.	1. Install possible railings required at the exit. 2. Open cargo compartment hatches, unload luggage and cargo. 3. Place luggage outside the cabin door or together with cargo on the luggage trolley. 4. Open the relevant cabin door and let the passengers out. They will take a piece of luggage with them to the exit as directed. **Please note:** Only one cabin door is opened, so that loose objects do not blow out of the helicopter. Ensure that the passengers keep a tight hold on any light objects.

Operation: boarding of passengers and loading

HELIGUARD (HLO)	HELIGUARD AND FIREGUARD
1. Checks that the heliguard is ready to receive passengers and then gives the signal to the fireguard that passengers can enter the helideck. 2. Directs/signals the passengers to the safe boarding route (outside the rotor disc) up to the heliguard. 3. Remains in the best position for eye contact with the pilot and for maintaining a full overview of the helideck.	1. On the HLO's signal, collect any boarding cards at the stairwell and point the way to the helicopter. Signal to the HLO that the numbers tally. 2. Lead the passengers safely to the helicopter and show where luggage is to be placed. **Please note:** In high winds, take care with light bags/cargo. 3. . Checks the following: • That XBR passengers are seated in XBR seats. • That all the passengers have fastened their seat belts. • That survival suit zippers are zipped all the way up. 4. Stows the luggage and closes cargo compartment hatches. 5. Before take-off, ensures that no loose objects are found in or outside the helicopter. 6. Closes the cabin door. When loading an S92, informs the pilot of the total weight in the top cargo compartment.

Helicopter take-off

From: heliguard clears the helideck

Until: two minutes after helicopter take-off.

Operation: preparing for take-off

HLO	HELIGUARD	FIREGUARD
1. Switches off floodlights. 2. Signals the heliguard to remove the chocks on the left-hand side. Removes the chocks on the right-hand side. 3. Checks that any railings near the stairs are lowered. 4. Once the helideck is clear and the fire guard and heliguard are in position, provides a clear "thumbs-up" sign to the pilots. 5. Monitors take-off and radio communication, and reports possible abnormal conditions immediately. 6. Immediately notify the pilots if there are traces of leaks or loose objects on the deck that could potentially make contact with the helicopter after take-off. 7. Ensures that no one leaves their post until two minutes after take-off. Furthermore, ensures that everyone remains in readiness for another eight minutes or until the helicopter has landed on another facility.	1. At the HLO's signal, removes the chocks on the left-hand side, leaves the helideck and takes the position. 2. . 3. Then stays at their post until two minutes after take-off, listens to the VHF in the event the helicopter reports a possible return to the facility. 4. Then remains in readiness at the direction of the HLO.	1. Puts on full fire protection gear. 2. Takes position at the upwind fire post, alternatively at the remote control unit. 3. Stays at their post until two minutes after take-off, listens to the VHF in the event that the helicopter reports a possible return to the facility. 4. Then remains in readiness at the direction of the HLO.

Alternative access

Procedures for alternative disembarking and boarding with guidance from helideck crew.

This procedure will be used if the normal procedure cannot be used because access to the helideck on the same side as the helicopter entrance is prevented.

Operation: disembarking around the nose of a S-92A/Super Puma

HLO	HELIGUARD AND FIREGUARD
1. Moves towards the nose of the helicopter from the side, retaining eye contact with the pilots and a view to each side, and takes position about one metre from the front of the nose and well inside the rotor tip. 2. Directs passengers from the heli/fireguard standing at the cabin door around the nose towards the luggage and/or the heli/fireguard standing at the edge of the helideck. See Appendix B on helicopter danger zones. Ensures that no-one is standing or walking in the zone with the rotor tip.	1. Opens the cargo compartment and places the luggage about 90° in relation to the helicopter on the opposite side from the cabin door or on the luggage trolley. 2. A heli/fireguard opens the cabin door and directs the passengers towards the HLO standing in front of the nose. 3. The other heli/fireguard takes position at the end of the line of luggage on the edge of the helideck and directs passengers to the nearest exit. Ensures that no one is standing or walking in the zone with the rotor tip.

Operation: boarding around the nose of a S-92A/Super Puma

HLO	HELIGUARD AND FIREGUARD
1. Takes position about one metre from the front of the nose and well inside the rotor tip, while retaining eye contact with the pilots and a view to each side. 2. Checks that the heli/fireguard is in position alongside the cabin door, ready to receive the passengers. Then gives the all-clear to the heli/fireguard standing at the stairway to admit the passengers to the deck. 3. Directs the passengers along the safe route between themself and the helicopter nose, and towards the heli/fireguard at the cabin door. Ensures that no-one is standing or walking in the zone with the rotor tip. 4. Returns to their normal position on the helideck outside the rotor zone when the passengers are on board, and secures a full overview of the helideck.	1. A heli/fireguard takes position at the door to the helicopter cabin. 2. The other heli/fireguard takes position at the stairway being used. 3. When the HLO gives the signal, they collect and count boarding cards at the stairway. The heli/fireguard directs passengers towards the HLO. 4. The heli/fireguard positioned outside the cabin door points out where luggage is to be placed and directs passengers on board. Ensures that no-one is standing or walking in the zone with the rotor tip.

APPENDIX G: HELICOPTER SHUTDOWN/START-UP

From: helicopter on deck, passengers have left both helicopter and helideck and the anti-collision lights have been turned back on

Until: the rotor has stopped, and the anti-collision lights have again been turned off.

Operation: Preparations

HLO	HELIGUARD	FIREGUARD
Stands in the safe zone with a full overview of the helideck and the wind at their back.	Stands in the safe zone at the stairway.	Maintains fire watch.

Operation: shutdown

HLO	HELIGUARD	FIREGUARD
The helideck can be entered when rotor has stopped, and the anti-collision lights are turned off. Secures help to tie down the rotor blades and the helicopter as required.	At the HLO's request, helps to secure the rotor blades and helicopter.	At the HLO's request, helps to secure the rotor blades and helicopter.

Helicopter start-up

From: helicopter on the helideck with pilots on board and anti-collision lights turned on.

Until: helicopter has both engines running and the rotor turning, the anti-collision lights are turned off, and the helicopter is ready to receive passengers and cargo.

Operation: Preparations

HLO	HELIGUARD	FIREGUARD
Maintains eye contact with the pilot and a full overview of the helideck. No passengers should be on board during start-up unless the pilot so wishes.	Stands at the stairway so that they have an overview of the helideck.	Fireguard stands at the relevant fire post/remote control unit wearing fire protection suits.

Operation: starting engines

HLO	HELIGUARD	FIREGUARD
Stands in the safe zone in front of the helicopter. Helps the fireguard when necessary.		Stands on the specified side of the helicopter with access to extinguishing agents to observe engine start-up. A portable powder extinguisher shall be available to the fireguard without having to leave the helideck. E.g., in a mounted box on the helideck perimeter. (When changing position after no 1 engine has started and the rotors are turning, shall walk outside the rotor disc to the next engine). In the event of fire in or under the helicopter, alerts the pilot/HLO by walkie-talkie or by giving the "shut down" signal. Starts to extinguish the fire.

Operation: final start-up stage, passenger boarding and loading / take-off without passengers

HLO	HELIGUARD	FIREGUARD
At the pilot's signal (anti-collision lights off), starts boarding passengers and loading cargo, removes chocks. When the heliguard is ready, signals the fireguard that boarding can commence. Counts the number of passengers after boarding to verify against the manifest.	Takes position and signals the HLO that boarding can commence.	Goes to the stairway to await the HLO's signal to start passenger boarding.

APPENDIX H - GUIDANCE FOR RADIO OPERATORS

EXCHANGE OF LOGISTICS INFORMATION

About 20 minutes before the estimated time of arrival (ETA), the helicopter will establish contact with the radio operator/bridge to update/obtain information on:

- Position, as well as heading and speed where relevant.
- Weather conditions.
- Helideck motion.
- Return load.
- Obstructions in the vicinity (within 500 metres) of the approach/ departure sectors.
- Fuel requirements.

The facility should have dispatched a helideck report to the heliport an hour before the planned time of departure from land. This report is carried by the helicopter crew during the flight. Therefore, only changes from the report submitted earlier need to be updated.

POSITION

Position shall always be stated in latitude and longitude with the following format:
N dd mm, mm E ddd mm, mm
d = degrees, and m = minutes and decimals of minutes
The heading of the facility is stated in degrees (magnetic north). Speed is stated in knots.

WEATHER CONDITIONS

If visibility is better than 10 kilometres and the cloud base higher than 1 000 feet, reference can be made to the helideck report provided earlier. Wind direction and speed as well as the QNH shall always be reported.
If visibility and the cloud base are below the values given above, a verbal update shall be provided to the helicopter crew in the following format:

- Wind direction, in degrees.
- Wind speed with gusts, in knots.
- Visibility, in metres or kilometres.
- Clouds/cloud base (FEW/BKN/OVC), in feet above sea level.
- Relevant temperature, in degrees Celsius.
- Dew point temperature (if available), in degrees Celsius.
- QNH, in hectopascals.
- Possible squalls or other weather phenomena of interest to the helicopter crew.

HELIDECK MOVEMENT

If deck movement is smaller than plus/minus one degree (less than one degree to any side in relation to the horizon), and vertical movements (heave) are smaller than two metres, the helideck can be considered stationary. Details need not be provided in such cases.

In the case of facilities with a helideck monitoring system (HMS), it should be sufficient to report "we have a GREEN deck on HMS", unless the helicopter crew requests details.

RETURN LOAD
This is specified in the following format (about 20 minutes before landing):

For each departure
Number of passengers/passenger weight/luggage weight/weight of any cargo/total weight.

Example:
Helibus 123, your return load will be:

- From Balder lifting with 14 pax/pax weight 1 359 kilograms/luggage 140 kilograms/cargo 12 kilograms/total weight 1 511 kilograms
- From Ringhorne lifting with 16 pax/pax weight 1 578 kilograms/luggage 164 kilograms/cargo eight kilograms/total weight 1 750 kilograms
- From Jotun A lifting with 18 pax/pax weight 1 795 kilograms/luggage 198 kilograms/no cargo/total weight 1 993 kilograms

OBSTRUCTIONS IN THE VICINITY OF THE APPROACH/ DEPARTURE SECTORS
This information is exchanged for two reasons:

1. To verify that the requirement for unobstructed access is maintained.
2. To give the helicopter crew a better mental picture under marginal weather conditions of what to expect when they emerge from the clouds.

FUEL REQUIREMENTS
This information is exchanged now so the HLO can prepare for refuelling when the helicopter is on the helideck.

Example of communication

Helicopter: Seaway Falcon, this is Helibus 123
Facility: Helibus 123, this is Seaway Falcon
Helicopter: We are on our way to you, and have an ETA (estimated time of arrival) of 23 (minutes past the hour).
Facility: You will be here at 23. Are you ready to receive the details?
Helicopter: We are ready. Go ahead.
Facility: Our position is N 59 31.35 E 006 46.55.
We have a heading of 300 degrees.
Our speed is five knots.
Weather in the area:
Wind from 270 degrees, 25 knots, gusting 35 knots.
Visibility three kilometres.
We have broken (BKN) at 800 feet.
Temperature eight degrees.
Dewpoint five degrees.
QNH 989 hectopascals.
A shower has just passed us.

The HMS shows green deck.

Return load:
You will be lifting with 19 pax/pax weight 1 895 kilograms/luggage 100 kilograms/freight 10 kilograms/total weight 2 005 kilograms.
We have one trawler lying 500 metres due south of us, heading south. No other vessels in the area.
Do you require fuel on arrival?

Helicopter: All received. We copied QNH 989. Negative refuel.
Facility: We copied negative fuel. Seaway Falcon.

CHANGES TO WEATHER CONDITIONS
If weather conditions change, whether it be visibility, cloud base, helideck movement or any other aspect which could be of interest to the helicopter crew, this shall be reported immediately over the radio.

APPENDIX I - SPECIFICATION FOR OFFSHORE REFUELING SYSTEMS

INTRODUCTION

This specification is applicable for all fixed and floating installations operating on the Norwegian Continental Shelf. Specific class requirements from the Norwegian Civil Aviation Administration (NCAA - BSL D 5-1), the Norwegian Maritime Directorate (NMD), Norwegian Petroleum Safety Administration (PSA), and relevant Class regulations shall be complied with. Relevant NORSOK standards should be adhered to.

This specification is based on the requirements made by the Norwegian Offshore Helicopter Operators for offshore helicopter refuelling systems. A refuelling system shall be approved by the Helicopter operator before first use, and regularly thereafter.

Revisions of this document are done on an" as necessary basis". Proposals for revisions shall be forwarded to Offshore Norge and the Norwegian Offshore Helicopter Operators for comments and advice.

GENERAL INFORMATION

The helicopter refuelling system shall be designed to be a self-contained, fully functional unit including a local control panel, capable of operating in a standalone mode. The design may include an interface to facilitate remote monitoring of the system.

The system design shall include no threaded connections on any wetted components. Exceptions are allowed for the connection to the delivery fuel hose, nozzles, dry break coupling, gauges, air eliminators, sample valves, instruments, and instrument fittings.

A complete system description, including a theory of operation, and operating instructions shall be developed by the system designer and provided to the system end user.

MATERIALS

All components in contact with fuel and all pipework shall be of stainless steel. Graphite packings shall have a stainless-steel ring on inner and outer edge. No copper alloys, cadmium plating, galvanized steel or plastic materials is permitted. Aluminium exceptions are: Dry-break couplings, nozzles, hose couplings, and instruments.

Grade marking: All filter units shall be marked to relevant standard and modification status.

DESIGN CRITERIA

- Norwegian Maritime Authority (NMA)
- Norwegian Ocean Industry Authority (Havtil)
- Class requirements shall be followed where applicable.
- NORSOK standards according to customer requirements.
- **Transportable tanks**: DnV 2.7-1 & IMO / IMDG requirements. Conform to the "Dangerous goods Code Type 1 or 2".
- **Storage and recycle tanks:** ASME VIII or equivalent.

- **Filter water separators**: According to EI 1581 Specification and qualification procedures for aviation jet fuel separators. Filter vessel design according to EI 1596.
- **Secondary filter:** according to either
  a) EI certified New technology Dirt Defence Filter EI 1599 with electronic water sensor EI 1598, or
  b) EI certified New technology Water Barrier Filter EI 1588. (N.B! pending certification), or
  c) EI 1583 Aviation fuel filter monitors with absorbent type elements. This std. is valid on existing systems until the new types of secondary filter units are commercially available, but not later than **30.06.2022.**
- **Refuelling hose:** type C, grade 2, semi-conducting, meeting the latest edition of EN ISO 1825 and EI1529 C.
- **Vessel movements**, wind and explosion loads and dropped object resistance shall be calculated and documented during construction of the system.
- All **pressure indicators** connected to the system shall have isolation and bleed valves.
- No **flow** in any process line shall exceed 7 m/s.

SYSTEM DESCRIPTION

An offshore helicopter refuelling system consist of the following subsections:

Fuel storage tank. This tank feeds the Pump module. The tank may either be a fixed storage tank or a transport/transit tank.

Pump module. The pump is fed with fuel from the connected delivery tank and pumps the fuel to the Dispensing module on the helideck.

Dispensing module. The module contains the delivery hose, the secondary fuel filter, the flow meter and the system control panel.

Filter/water separator. This is the primary filter unit installed either in the pump module or in the dispensing module.

Secondary filter unit. This unit shall detect any water and stop impurities still present in the fuel. The flow of fuel shall be cut once a certain amount of water has been exceeded.

Recycling module. The unit contains a small tank to collect and settle fuel samples and a pump to return the fuel, via a filter, to the storage tank.

Sampling cabinet

A cabinet for central execution of analysis of the fuel samples. Lines from the different sampling points terminates in sampling jars in the cabinet. The jars are later drained to slop, or into a recycling module.

SYSTEM REQUIREMENTS

Tank base with Laydown skid

The skid may hold either a fixed storage tank or one or several transport/transit tanks depending on the system design. A drip tray shall be installed and be able to collect and hold min. 100% of the content of the tank in use. The drip tray

shall be equipped with a suitable drain connection to allow for effective draining of the drip-tray.
To protect the deluge system/pump unit from damage during tank handling a guide/ buffer frame should be fixed to the base of the skid.
Transportable tanks should be properly secured to a solid base on moving vessels.
A ss helix convoluted EN 1825 suction hose with a 2.5" dry break coupling shall be used to connect a transit tank in use to the pump unit. The other end should be sized to fit the (pump) unit inlet flange (ANSI 150lbs).
The base frame shall be bonded from two different locations. All tanks installed on the laydown skid shall be bonded.

Deluge system
A Deluge system shall be installed according to design criteria.
The Tank in use shall have protective deluge system according to class requirements, NMD or minimum 10 l/m2/min.
A calculation report (hydraulic calculation) for the deluge system shall be calculated and documented.
Fire detection: Acc. to class requirements or customer specification.

Transit tanks
Transit tanks shall be constructed to satisfy DnV 2.7-1 & IMO / IMDG requirements and be of stainless steel. They shall also conform to the "dangerous goods Code.
Transit tanks shall have a suitable dipstick of stainless steel or fibreglass material.
A valve with provisions for remote operation shall be mounted directly on the tank outlet. When connected to the pump module, the tank outlet valve on the tank in operation shall be capable of remote closure from the helideck (dispenser unit) by a powered actuator.
The outlet/fill connection shall be flanged with a 3" internal valve terminating to a 2.5" self-sealing coupler with dust cap. The tank outlet shall be at least 150mm higher than the lowest point of the tank.
The drain connection shall be equipped with minimum 1.5" internal valve terminating in a plugged ball valve preferably 1". The plug shall be installed on the end to prevent the ingress of dirt and moisture.
In order to allow 4L sample jars to be used, the sample point should be designed with sufficient access (250mm), space and height to accommodate the standard 4 L sample jar. The sample line from tanks shall be minimum 3/4".
A stainless 2.5" emergency pressure/vacuum relief valve with weatherproof anti-flash cowl shall be fitted.

Fixed storage tanks
Fixed storage tanks shall be constructed to suitable standards (e.g. ASME VIII).
The tank shall slope 1 on 30. The sump shall be fitted with a 3/4" minimum sample line which has both a ball valve and a self-closing ball valve at the sample point.

The outlet should preferably be designed as a stainless floating suction device with a bonded wire pull assembly fitted to the top of the tank. Alternatively, a stack pipe, which extends at least 150mm above the lowest point of the tank, might be installed.
Make sure the drain point on the stationary tanks on mobile units (e.g. rigs / FPSO's) are able to drain the tank sump varying on the vessel's movements / position.
Tank inlet/outlet valve should be capable of operation from both helideck (dispenser unit) and from another point, which is at a safe distance from the tank.
The tank shell shall be properly bonded.
Each chamber shall be equipped with min. 500mm quick release hinged manhole to allow physical access.
Each chamber shall be equipped with a sight glass/content gauge to determine the tank content.
A closed-circuit sampler connected to the sample point is recommended.
A combined pressure/vacuum relief valve shall be installed on each closed chamber of the tank.

Pump module
A 60 mesh Y-strainer shall be installed at the inlet of the pump unit.
The pump shall be air or electrically driven, equipped with a positive displacement vane pump or centrifugal pump with a head pressure suited to the installation. Flowrate shall nominally be 225 l/min. The pump unit should be constructed to meet EX zone 1. The pump shall be equipped with a relief valve routed to the pump suction side.
The pump unit shall be connected to only one tank or chamber at a time.
A check valve shall be installed on the discharge side of the pump.
An emergency stop valve (for pneumatic driven systems) or emergency stop panel (electric driven) shall be installed.
Block/ball valves should as a minimum be installed on the pump unit inlet and outlet flange.
A pressure gauge shall be installed on the pump discharge side.
A device for automatic pump-stop at a pre-set time after start shall be installed.
A device that automatically stops the pump at tank low level shall be installed in the system. This to avoid air being drawn into the system.
A drip tray shall be installed and be able to collect spillage. The drip tray shall be equipped with a suitable drain connection to allow for effective draining of the drip-tray.

Filter Water / Separator
A filter water separator according to the EI 1581 specification, sized to suit the pump capacity shall be installed either in the pump unit or in the dispensing unit.
The Filter / Water separator shall also be fitted with:
A differential pressure gauge for monitoring the conditions of the elements.
An air eliminator which automatically vents any air entering the vessel
A pressure relief valve
A closed-circuit sampler connected to the sample point is recommended

A self-closing valve on the 12mm (minimum) drain connection

Dispensing module

Product/flowmeter

The product/flowmeter shall be sized to suit the flow rate and the counter shall be resettable.

Nozzles

Fuel delivery to aircraft shall be available both by pressure and gravity refuelling.

Both types of nozzles shall be provided with bonding cables and dust caps to prevent the ingress of water and dirt.

Pressure: The pressure nozzle shall be fitted to the hose end pressure control unit. The nozzle shall be equipped with a surge controller rated to maximum 35 PSI. The nozzle shall be equipped with a 100 mesh stainless steel cone strainer, and a bonding wire with jack plug/clip.

Gravity: The gravity nozzle shall be fitted with a stainless 100 mesh strainer, a bonding wire and clip. The gravity nozzle shall be connected to the hose with a quick release adapter.

Hose reel & fuel hose

A fire safe/antistatic ball valve shall be installed in front of the hose reel. The 30m.(nominal length) 1.5” delivery hose should be of an approved type C semi conducting type to EN ISO 1825 or EI 1529 C..

Clamp type couplings shall be used at hose terminations.

Secondary fuel filter

The filter may have 3 different designs:

a) Aviation fuel filter monitor with absorbent type elements, standard EI 1583. This solution requires an automatic Differential Pressure cut-off switch, or a procedure to monitor and record the filter differential pressure during refuelling. This std. is valid until superseded by:

b) EI certified new technology Dirt Defence Filter EI 1599 with electronic water sensor, standard EI 1598, or

c) EI certified New technology Water Barrier Filter, standard EI 1588.

The secondary filter unit shall also be equipped with:

A differential pressure gauge or transmitter for monitoring the conditions of the elements.

An air eliminator which automatically vents any air entering the vessel

A pressure relief valve

A closed-circuit sampler connected to the sample point.

A self-closing valve on the 12mm (minimum) drain connection.

Bonding equipment

A “ground current” indicator, approved for the purpose, shall be installed to restrict the pumps being operated until the ground indicator has approved the continuity. A spring-loaded bonding cable reel sized for 30m cable and bonding clip shall be installed. A steady yellow Ex lamp installed outside on top of the dispensing cabinet shall indicate when the helicopter is properly bonded.

Recycle module (not a requirement)
The recycle tank shall have a slope of minimum 1 on 30. The tank shall be equipped with an inspection hatch in order to clean the tank properly. The tank shall be designed according to TBK, ASME, BS or other appropriate code. The same rules apply for this unit as for the pump and dispensing unit. If a pump is included it shall be of a flanged, positive displacement vane type pump or centrifugal pump.
Recycle tanks should not have more than 300 litres in volume.
The return line to the storage tank should be routed as to avoid any water traps in the line.
The transfer pump shall be a separate pump with low capacity and limited pressure to safely allow ullage air to escape from the receiving fixed or transport tank through the P/S valve.
The line to the receiving tank shall be equipped with a separate suitable 5 micron filter or filter-separator.
The recycle tank outlet line shall be routed to the tank in use and should be connected to the outlet valve or hose, or to the sample outlet. The hose may be connected with a Tee for a semi-permanent connection.

Sampling cabinet (not a requirement)
The inlet lines from the sample points shall be dimensioned two ensure a high drainage flow (my 12etc dia.) but a line should not hold more than the drained volume to avoid stagnant fuel.
The cabinet shall give ample shelter for wind and rain and should be designed to have room space for one person to conduct sampling and have access to all installed equipment.

APPENDIX J - HELICOPTER REFUELLING WITH ROTOR RUNNING

Refuelling with passengers on board can be agreed between pilot and HLO, and shall comply with the requirements specified in Chapter 6.11 and the standard procedures, (cf. this appendix).

HLO	HELIGUARD	FIREGUARD
1. Remains in position with an overview of the entire helideck. When the fireguard has connected the earth cable and is in position (beside the HLO), they take over the job of securing the helideck. 2. The HLO walks to the fuel cabinet and takes a fuel sample. 3. The HLO and pilot check the fuel sample. 4. Verifies that the earthing light is on, the counter is set to zero and that the fuel hose is connected to the helicopter. 5. When the fireguard signals, pushes the button to start refuelling.	1. Waits until the helideck is free of passengers and pulls out the fuel hose. When the fireguard has connected the earth cable, earths and connects the fuel hose to the helicopter before opening the connector valve. 2. Remains in position at the helicopter refuelling point.	1. Pulls out the earth cable and earths the helicopter. The fireguard can assist the heliguard with connecting/ disconnecting fuel hoses as required. 2. Takes position beside the HLO in front of the helicopter, with a clear view of the pilot, heliguard and fuel cabinet. A portable powder extinguisher shall be available to the fireguard without having to leave the helideck, e.g. in a mounted fixed box on the helideck perimeter. 3. Takes over the job of securing the helideck. 4. On signal from pilot, signals the HLO that refuelling can begin.

Completion of refuelling

HLO	HELIGUARD	FIREGUARD
1. On signal from fireguard, halts refuelling from the cabinet. 2. Takes new fuel sample. This is checked by the HLO and pilot. The pilot signs the fuel log. 3. Goes up to the helideck, stands beside the fireguard and takes over security of the helideck from them. 4. When the heliguard is ready, signals to the fireguard that boarding can begin.	1. On signal from the fireguard to halt refuelling, closes the connector valve on the fuel hose. 2. The fuel hose with earthing is disconnected, and the hose is rolled up on the reel.	1. On signal from the pilot to halt refuelling, signals this immediately to the HLO and heliguard 2. Remains in position until the HLO is in place to take over deck security. 3. Disconnects the earth cable and rolls it onto its reel.

Please note: Some helicopter types use their own automatic shut-off system for fuel.

APPENDIX K – HELIDECK MONITORING SYSTEM (HMS)

Standard Measuring Equipment

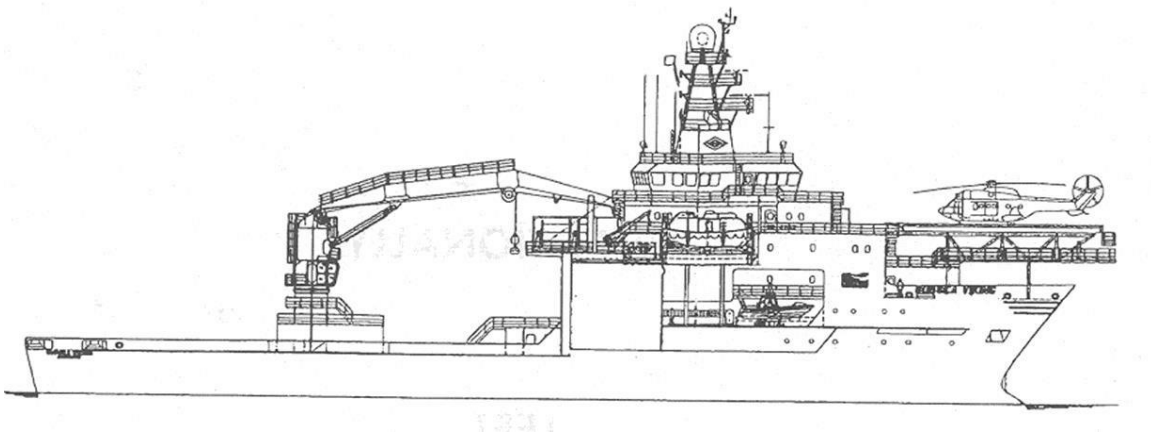
for

Helideck Monitoring System (HMS)

and

Weather Data

Offshore Norge
Bristow Helicopters Norway
CHC Helikopter Service
Lufttransport RW AS



REVISION

	Date	Changes
Rev 9.1. No	10 March 2015	- Introduction of Significant Heave Rate method
Rev 9.2. No	01 May 2017	- Clarification of Significant Heave Rate calculation to include hysteresis and deck status - System accuracy and verification - General update of all chapters
REV 9.2 No	29.09 2024	- Ch 2. Pitch and Roll. Clarification: the roll axes is parallel with the vessel heading – not with the helideck heading - ch.4 Semisub Cat 2 and 3 included in table (editorial change) - Ch 4. Added g) The ship shall be maneuvered out of wind by 30 degrees to improve visual cues during landing/take-off. - Ch.10.New requirement: All HMS data (Helideck monitoring system) shall be made available for sharing in real time with the helicopter operators

1. PURPOSE AND INTENTIONS

The purpose of this document is to ensure uniformity of readings/registration of helideck movement and weather conditions.
These standards are valid on NCS as mandated by the Offshore Norway helideck manual managed in agreement between Offshore Norway and the Helicopter operators.
Further intentions are to establish National and International standards based on contents of this document.

2. DEFINITIONS

Moving helidecks

A helideck mounted on a floating unit such as a Vessel, Floating Production Unit, Semi-Submersible Rig, floating Jack Up Rig, and other helidecks shall be considered to be an unstable/moving landing area if:

- the pitch or roll exceed 1 degree, and;
- the heave amplitude of the helideck exceeds 2 meters, and/or;
- the heave rate exceed 0.3 m/ second.

Pitch and Roll (P/R)

Pitch and Roll angels relative to absolute horizon. The roll axes is parallel with the vessel heading.

Helideck Inclination (Inc)

Is the angle between the absolute horizon and the plane of the helideck.

Heave Amplitude (HA)

The vertical movement of the helideck.

Significant Heave Rate (SHR)

The average of the one-third highest values of instantaneous heave rate recorded the previous 20-minute monitoring period. This can more conveniently be calculated by:
Significant Heave Rate (m/sec) = 2 x rms (Root Mean Square) of the instantaneous heave rate.

3. CLASSIFICATION OF HELIDECKS

There is no official classification method available for this purpose. The proposed classification contains three categories based on the actual floating unit's size, configuration and motion characteristics. Limitations are defined by helideck pitch, roll and inclination and by helideck heave rate. A prime requirement is that the installations have measuring and monitoring equipment installed, and functional, in accordance with this document. Those installations which would normally fall into Category 1 or 2, but which either do not have the appropriate measuring or monitoring equipment installed, or whose equipment is inoperative, are automatically downgraded by one category (e.g. a Category 1 deck with inoperative equipment becomes a Category 2 deck). The category will be entered on the individual vessel/rig information plate in the North Sea Airway Manual or rig plate and the Company Helideck Limitation List (HLL).

Category 1
Semi-submersibles including floating jack ups and all large vessels including FPSOs and tankers.

Category 2
Small vessels, e.g. DSVs and seismic vessels, with a helideck that offers good visual cues. This would normally be a stern or amidships deck offering a view of the structure of the vessel through at least 90° (assuming the vessel is seaming approximately into wind).

Category 3
Small vessels with poor visual cues, such as a bow deck or a deck mounted above the bridge superstructure with the landing direction facing forwards (bow deck) or abeam (high deck).

> *Note: Small vessels will be categorized 2 or 3 on inspection and their helideck documentation will reflect this (except that small vessels with amidships decks will always be Category 2).*

In addition, aircraft are divided into two types – heavy and medium. The heavy types are the AS332 series, EC225, AW189 and S92. The medium types are the EC155, EC175, AW139 S76 series

> *Note: This does not constitute a helideck approval for a specific helicopter type on a specific helideck.*

4. OPERATIONAL LIMITATIONS
The classification is defined in this table:

AIRCRAFT CATEGORY		HELIDECK CATEGORY								
		1			2			3		
		P/R	INC	HR	P/R	INC	HR	P/R	INC	HR
HEAVY	DAY	±3	3.5	1.3	±2	2.5	1.0	±2	2.5	1.0
	Night Semi-sub	±3	3.5	1.0	Not applicable			Not applicable		
	Night other	±2	2.5	1.0	±2	2.5	0.5	±1	1.5	0.5
MEDIUM	DAY	±4	4.5	1.3	±3	3.5	1.0	±3	3.5	1.0
	Night Semi-sub	±4	4.5	1.0	Not applicable			Not applicable		
	Night Other	±3	3.5	1.0	±2	2.5	0.5	±1.5	2.0	0.5

P/R = Pitch and Roll (deg);

INC = Helideck Inclination (deg);
HR = Significant Heave Rate (m/s);

Notes:

a) Category 3 vessels (Bow mounted helideck) operating with the helideck downwind are automatically upgraded to Category 2.
b) Category 2 vessels (Stern helideck) operating with the helideck upwind are automatically downgraded to Category 3.
c) Vessels with Midships helidecks are normally Category 2.
d) Where Heave rate is available and within limits, HA is for information only, and is not part of the calculations regarding helideck availability.
e) The table above is not applicable for operations to and from single point mooring buoys (SPMs). These are considered fixed installations. Limitations are given on Helideck Information Plate.
f) Night landing on Category 2 and 3 helidecks that are moving position (for example seismic or towing) should be avoided. If night landings are unavoidable the following applies:
    - Minimum weather requirement is visibility of 5000 meter. Further risk mitigation may be imposed by the helicopter operator.
g) The ship shall be maneuvered out of wind by 30 degrees to improve visual cues during landing/take-off.
h) .

5. PRINCIPLES

Basic requirements are contained in:

- Norwegian Requirements in BSL D 5-1
- ISO 19901-1: 2015 Petroleum and natural gas industries -- Specific requirements for offshore structures -- Part 1: Metocean design and operating considerations
- NORSOK C-004 Helicopter deck on offshore installations
- NORSOK T-100 Telecom subsystems

The measuring equipment shall provide sufficient information to the operator to complete all sections of the standard “Helideck Report”, provided for by the helicopter operators. The last page of the helideck manual contains the helideck report template.

Measuring equipment sensors for helideck movement, wind and weather data shall be located in optimum positions in order to provide relevant information relating to the helideck.
Helideck heave data shall be representative for the centre of the helideck. It is recommended to locate the motion sensor within 4 meters from helideck centre for new designs in order to meet a possible future requirement for measurement of Motion Severity Index (MSI).

All information shall be numerically displayed in relevant locations on the vessel or rig for easy communication with helicopters in flight and the helicopter land base operations. The system shall facilitate transmittal of electronic data to the helicopter land base operation, which in turn can eliminate the need for a separate Helideck Report to be submitted.

The helicopter owner should have a solution for HMS data to be shared with applications used by the helicopter operators.

6. ACCURACY OF MEASUREMENT

The HMS shall at all times comply with the system accuracy requirements given below. The system shall be properly maintained and a record of all certificates, verification reports and maintenance history shall be available to appointed Helideck Inspectors on request.

System accuracy

The dynamic accuracy of the data produced by the Helideck Monitoring System concerning motion shall be:

Pitch / Roll / Inclination: <± 0.1° RMS (Root Mean Square) in the range 0 to 3.5° and Heave Rate: < ± 0.1 m/s RMS (Root Mean Square) in the range 0 to 1.3 m/s

The accuracy concerning the meteorological data shall be in compliance with:

- ISO 19901-1: 2015 Petroleum and natural gas industries -- Specific requirements for offshore structures -- Part 1: Metocean design and operating considerations

Any temporary deviation from above, due to performance degradation or equipment failure shall be reported to the helicopter operator with a plan for corrective actions.

Verification

The HMS should undergo initial and periodic in field verifications in accordance with the system manufacturer's procedures and recommended intervals.

The complete HMS (sensors and programs) shall be checked and verified. A qualified field service engineer, trained and certified, shall perform the system verification.
All test instruments, including the Motion Measurement Verification Equipment located at the centre of the helideck during the test, shall have traceable calibration certificates with details included in the verification report.

Recommendations from the motion sensor manufacturer should be incorporated in the system test procedures. Motion measurement verification intervals should be in accordance with the sensor's manufacturer's procedure, but at least every 3 years.

The motion range measured during the verification tests shall be relevant to the typical operational conditions for the installation and a minimum of 5 test periods of minimum 20 minutes duration shall be conducted.

A verification report documenting the correctness of the system shall be issued to the owner of the installation. This should be done after initial installation, replacement of motion sensor, and after each periodic control. The results should be displayed in an unambiguous way (graphical or other visual display) to allow easy interpretation.

The owner/ operator of the installation shall ensure storage of the verification data for a minimum of 3 years, to enable traceability.

Maintenance

All parts of the HMS shall undergo periodic inspections and preventive maintenance as defined by the HMS manufacturer, including sensor swap out with factory overhauled or calibrated units. Periodic maintenance shall only be conducted by trained personnel.

7. MEASURING HELIDECK MOTION

All helideck motion parameters shall be reported to one decimal place.

Maximum Pitch

The equipment shall be capable of measuring helideck pitch in degrees up and down from zero, with zero being the absolute horizontal level. It shall be possible to read the historic maximum angles over the past 20 minutes, direct and, if possible, graphically. The graphical presentation shall cover 20 minutes of data and alternatively 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1-minute intervals. In maritime terms maximum pitch consists of trim + pitch.

Maximum Roll

The equipment shall be capable of measuring helideck roll in degrees right/starboard and left/port, with zero being the absolute horizontal level. It shall be possible to read the historic maximum angles over the past 20 minutes, direct and, if possible, graphically. The graphical presentation shall cover 20 minutes of data and include 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1-minute intervals. In maritime terms maximum roll consists of list + roll.

Maximum Helideck Inclination

The equipment shall be capable of measuring the maximum helideck inclination in degrees to the absolute horizon over the past 20 minutes, direct and, if possible, graphically. The graphical presentation shall cover 20 minutes of data and alternatively 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1-minute intervals.

Maximum Heave Amplitude

The equipment shall be capable of measuring vertical helideck movement from top to bottom, with readings in meters. The maximum heave (total vertical movement) of the helideck is the maximum top to bottom value in one cycle (one movement curve) over the past 20 minutes.
It shall be possible to read the historic maximum value over the past 20 minutes direct and graphically. The graphical presentation shall cover 20 minutes of data and alternatively 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1-minute intervals.

Heave Period

The equipment shall be capable of measuring the time between helideck movement summits in seconds (i.e. based on a wave curve the measurement starts and ends in the zero up crossing point). The graphical presentation shall cover 20 minutes of data and alternatively 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1-minute intervals.

Significant Heave Rate (SHR)

The equipment shall be capable of measuring the vertical movement rate of the helideck in meters per second.
The significant heave rate shall be updated at least at 1-minute intervals, using a moving 20-minute window. The SHR value is calculated directly from the instantaneous heave velocities sampled at 2Hz intervals or more in accordance with the following formula:

2 x RMS (Root Mean Square) of the instantaneous heave rate

It shall be possible to read the historic maximum value for the past 20 minutes direct and graphically. The graphical presentation shall cover 20 minutes of data and alternatively 3 hours for trend determination. The graph and the associated maximum value over the last 20 minutes shall be updated at least at 1 minute intervals.

8. HEADING AND POSITION DATA

The heading of the helideck and the vessel shall be stated in degrees relative to magnetic North. Vessel position shall be reported in WGS84 coordinates on the following format: “deg° min’ sec” N/S/E/W”. The HMS shall be connected to a gyro and a position monitoring system if the parameters are a variable. Manual setting of magnetic declination is possible but shall be checked after vessel/rig movement.

9. WEATHER DATA

Data for this section may be assessed using other equipment than the HMS system but shall be of a standard that has a possibility to deliver data to the HMS system (Ref. Chap. 6, NORSOK standards N-002 and C-004).

Wind Direction
Wind direction shall be stated in degrees relative to magnetic North.
Displayed wind direction shall have the options to show real time wind direction, 2- minute mean wind direction and 10-minute mean wind direction.

Wind Speed
Wind speed shall be stated in knots.
Displayed wind shall be easily selectable to show real time wind, 2-minute mean wind with gusts exceeding ten knots of the mean wind, and 10-minute mean wind with gusts exceeding 10 knots for 3 seconds or more of the mean 10 minute wind.

Visibility
Horizontal visibility shall be stated in meters.

Temperature/Dewpoint
Temperature/dew point temperature shall be stated in degrees Celsius.

Air Pressure
Air pressure shall be stated in hPa as QNH, meaning; altitude adjusted for height and temperature relative to Mean Sea Level.

Cloud
Cloud shall be stated as few/scattered/broken/overcast (FEW/SCT/BKN/OVC) in feet above the sea surface.

Logging system
The system should be able to log all data for 30 days. The historic data should be available by configuring the date and time to the period of interest.

10. HELIDECK MOVEMENT AND WEATHER DATA DISPLAY

All HMS data (Helideck monitoring system) shall be made available for sharing in real time with the helicopter operators

Data Display layouts shall be approved by the Helicopter Operators. The display shall indicate which HMS standard the complete system is compliant to (e.g. HMS Rev 9.2.No).
The user of the display shall be able to control the setting of the following configuration parameters: night/day, large/medium aircraft and helideck category 1/2/3 (for those with variable classification).
It is important to use the notification SHR for all HR data on the display to avoid ambiguity with historic calculation methods.

Traffic light on display

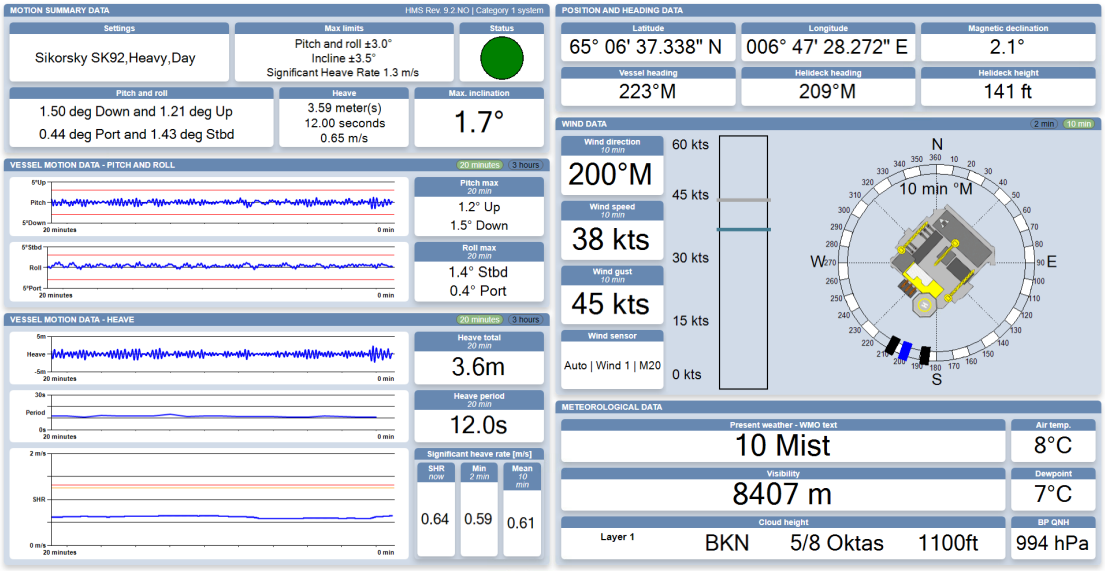
The “traffic light” on the display indicates when one of the following parameters have reached a threshold: Roll, Pitch, Inclination, or SHR. As long as all the measured parameters are within or on limits it should show a green light, and when a limit is exceeded, it should show a red light.

Due to the nature of the SHR signal, the following trigger logic should be applied to the SHR input to the helideck motion status:

- The helideck motion status becomes RED if:
  - The HR limit is exceeded; and
  - all of the records in the previous 2 minutes have also exceeded the HR limit (or equivalently, the minimum SHR in the previous 2 minutes exceeds the HR limit).

- Once the deck motion status is RED, it becomes GREEN again only if:
  - The SHR falls below 95% of the HR limit, and
  - the mean of the records in the previous 10 minutes is below the HR limit.

Typical layout:



11. LOGISTICS INFORMATION DISPLAY

Data Display layouts shall be approved by the Helicopter Operators. The layout shall as a minimum include all data from the *Standard Helideck report* used on the NCS that is not already covered by the *Helideck Movement and Weather data display.*

APPENDIX L - REPORTING FORM

Place: Date: Time:

Operation of aircraft - helicopter	
Collision or near-collision between an aircraft and another aircraft or an obstacle	☐
Collision or near-collision between an aircraft and birds	☐
Collision or damage caused to aircraft by equipment or vehicle on the helideck	☐
Failure to observe clearance, instructions or relevant information	☐
Incident caused by airstream from a jet engine or rotor	☐
Breach in or failure of communication between personnel on helideck and aircraft	☐
Emergency call sent - "Mayday" or "Pan-Pan"	☐
Security	
Illegal entry, attack on aircraft, bomb threat, sabotage or hijacking	☐
Observation of unknown drone activity	☐
Passengers or unauthorised people unsupervised on the helideck	☐
Technical safety system	
Obstacles related to helideck and unannounced helicopter operations	☐
Substantial deficiencies in markings or signs on the helideck	☐
Substantial deficiencies in lighting of the helideck and obstacles	☐
Inadequate marking of obstacles or hazards in the helideck's manoeuvring areas	☐
Rescue and firefighting services not available in accordance with requirements	☐
Deficiencies, faults or inadequacies in de-icing/preventing ice formation on the helideck	☐
Handling of passengers, luggage and cargo	
Substantial contamination of the aircraft from luggage or cargo	☐
Incorrect handling, loading or manifest of passengers, luggage or cargo	☐
Faulty stowing and securing of luggage or cargo	☐
Transport of dangerous goods in contravention of applicable rules, incorrect marking, manifest and packing	☐
Excess weight in cargo compartment *	☐
Work on ground and aircraft servicing	
Open doors, luggage ramp, hatches, covers and handles, missing fuel caps, etc *	☐
Oil/hydraulic leak from helicopter to helideck *	☐
Discovery of loose objects/foreign objects (FOD) on the helideck	☐
Handling of fuel	

Refuelling with contaminated or wrong type of fuel	☐
Refuelling wrong fuel quantity affecting the aircraft's performance, weight and balance	☐
Substantial spills/leaks of fuel during refuelling	☐
Other incidents	
Human performance directly contributed or could have contributed to an accident	☐
Course of events	
Name:	Position/role: