

Mukamalah Aviation Company

Vessel Helideck Operations Guidance Manual



FOREWORD

1. The Mukamalah Aviation Company has developed the **Vessel Helideck Operations Guidance Manual**, compiling a comprehensive list of policies and procedures for offshore helideck operations, following the UK CAA CAP 437 and GACA Part 138 requirements to ensure safe operations on offshore vessels or Normally Attended Installations (NAI).

This document is divided into ten (10) Sections:

- Section 01: Purpose
 - Section 02: Helideck Inspection Requirements
 - Section 03: Noncompliance Reporting Policy
 - Section 04: Standards for Helidecks
 - Section 05: Helicopter Operation Manual
 - Section 06: Safety Posters
 - Section 07: Communications
 - Section 08: Aircraft Information
 - Section 09: Abbreviations & Acronyms
 - Section 10: Reference Material
2. This **Vessel Helideck Operations Guidance Manual Revision 07, September 2023**. Supersedes the Aviation Department Normally Manned Installation/Vessel Helideck and Operations Requirements, Revision 06, October 13, 2022.

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Purpose

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1.0 PURPOSE

The purpose of this document is to describe the minimum standards required by Mukamalah Aviation Company to ensure safe operations on offshore vessels or Normally Attended Installations (NAI). An NAI is an installation that during normal operations is manned, such as installations that are permanently manned, installations that are manned for the majority of the work day with or without living quarters, floating installations, production installations, drilling rigs, and vessels. It intends to contribute to the safe conduct of Mukamalah operations ensuring uniform standards and behavior. The document describes the areas of responsibility on the helideck, the requirements for the helideck crew and their equipment, and determines how activities and tasks are managed and conducted so that operations on the helideck are executed safely and properly.

This document is by no means a comprehensive list of policies and procedures for offshore helideck operations. NAI installations are required to and shall develop a Helicopter Operations Manual that is tailored to the installation following CAP437 and this document.

Helideck Inspection Requirements

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2.0 HELIDECK INSPECTION REQUIREMENTS

Aviation Department

Box 80, Dhahran
Tel: 877-4940 Fax: 877-49
November 28, 2019

AVI/MGR/079/2019

Offshore Helideck Operations Standard

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Drilling Operations Manager
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R-223-A, Floor 2
Drilling And Workover (Bldg. 3193)
Dhahran

Aziz S. Al Qarni (A)
Marine Manager
Floor 1
Marine Terminal Wing
Tanajib Marine Complex (Bldg. 19)
Tanajib

Abdullah S. Al Qahtani
Safaniya Offshore Producing Manager
R-346A,
Floor 3,
New Admin Bldg (Bldg. 5300)
Tanajib

Naif A. Al Sulami
Ras Tanura Producing Manager
R-2086,
Floor 2,
Industrial Complex Bldg (Bldg. 100 RTPD)
Ras Tanura

Due to the increased volume of moveable vessels contracted by Saudi Aramco, Aviation requires all moveable vessels (Drilling Rigs, barges and boats) perform the required annual helideck inspection in accordance with the most current CAP437 regulations and Saudi Aramco Aviation amendments by an outside source. In addition, Aviation requires all helideck teams be in possession of a valid Offshore Petroleum Industry Training Organization (OPITO) training certificate appropriate to their assigned duties.

Companies utilized to conduct helideck inspection shall be CAP437 helideck inspection vendors approved by Aviation. Completed inspection documentation shall be provided to the Aviation Safety and Compliance Unit (ASCU) who will review and approve the helideck for operations.

To ensure the safety of Saudi Aramco Employees and assets during helideck operations, adequately trained helideck teams shall be provided. Helicopter Landing Officers (HLO's) shall be trained to a minimum of the Helideck Emergency Response Team Leader (HERTL) competency. Offshore Helideck Assistants (HAD's) shall be trained to a minimum of the Helideck Emergency Response Team Member (HERTM).

In order to ensure a safe helideck environment and a minimum level of competency for helideck teams, Aviation requires the above requirements to be complied with by June 1, 2020 in order to continue operations.

Should you require further information, please contact Capt. Paul Arpke at telephone number 013-673-0216.

cc: Aviation Safety, Compliance & OE Unit


Khalid H. Alnatour
Aviation Manager (A)

2.1 Helideck Inspections

Mukamalah Aviation Company is no longer conducting on-site audits or certification of helidecks. Mukamalah requires a valid and annual helideck inspection following the most current CAP 437 regulations and any Mukamalah amendments.

Completed inspection documentation shall be provided to Mukamalah's Safety & Risk Management Unit (SRMU) which will review and approve the helideck for operations.

Mukamalah approved vendors who may perform the CAP 437 Helideck inspections:

- HCA (Helideck Certification Agency) - Located in UAE and UK
- THCL (The Helideck/ Helipad Company Limited - operated by ORYX) - Located in KSA, Bahrain, and UAE
- ORYX (ORYX Aviation Services LLC)- Located in UAE, KSA and Bahrain
- Aries Marine – Located in UAE, Bahrain, and KSA
- Swire Energy Services – Located in the UK and UAE

Noncompliance Reporting Policy

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3.0 NONCOMPLIANCE REPORTING POLICY

Any failure to comply with CAP-437 or Mukamalah Aviation Company helideck requirements design, and operations requirements shall be immediately reported to Mukamalah's Safety and Compliance Unit. If it is discovered that a deficiency was not reported, Mukamalah will immediately stop all operations to the installation, resuming operations at its discretion only when all critical items have been corrected.

Standards for Helidecks

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4.0 STANDARDS FOR HELIDECKS

4.1 General

4.1.1 General Arrangement Drawings

The installation/vessel shall provide Mukamalah's Safety & Risk Management Unit (SRMU) with a full set of up to date-as-built helideck drawings.

Helideck drawings must indicate:

- General Arrangement (Plan of the whole installation)
- Plan view and side elevation
- 210°, 150° & 180°, 5:1 sector
- All obstructions
- Items close to the sectors.
- Hot and cold emission sources
- Helideck markings
- Tie-down points
- All lighting
- Location of RFFF
- Refueling system
- Guttering & downpipes
- Access points
- Windsocks

An installation with a current helideck certificate is required to inform the SRMU of any proposed modification and the potential effects it will have on helicopter operations.

4.1.2 Installation / Vessel Identification

Installation identification signs shall be visible from the air from all headings. The letters and location of the identification shall be of sufficient size to be unambiguous and legible from the air. All identification signs shall be illuminated to be readable at night and in poor visibility.

4.1.3 Manuals

The installation/vessel shall maintain a library easily accessible to all personnel responsible for helideck operations. At a minimum, the library will contain:

- CAP 437 Regulations and requirements
- IATA DGRs & Addendums
- An installation specific Helicopter Operations Manual

4.1.4 Helicopter Emergency Diagrams

The installation/vessel shall display in the helicopter waiting area, at a minimum, the following safety posters (Section 06)

- Danger Area Diagrams for all Mukamalah Helicopter Types
- Dangerous Goods Policy

- Other Safety Posters

4.1.5 Passenger Briefing Equipment

A dedicated passenger briefing area shall be established free from distractions. Ideally, it should be in the same location as the passenger waiting area.

A passenger waiting area shall be established at a minimum of 2.1 m (7 feet) below the helideck, the passenger waiting area shall be so positioned as to be out of the helicopter/helideck crash fragment area and shall be equipped with helicopter and boarding instructions and warning signs.

All passengers shall assemble in the helicopter waiting area at least 30 minutes before the helicopter arrival; passengers will not leave this area to proceed to the helideck until instructed to do so by the HLO.

Each installation/vessel is required to show the appropriate full Mukamalah Helicopter Safety Briefing video to all personnel traveling onboard a Mukamalah aircraft.

The installation is to maintain a log that records the date, the passenger's full name, and the passenger's signature confirming that the Mukamalah Helicopter Safety Briefing video was watched.

4.1.6 Scales for Passenger, Baggage, and Freight

The installation/vessel shall have available a calibrated scale to be used to weigh passengers, baggage, and cargo to be transported by helicopter. All weights shall be recorded in Kilograms. Scales shall be calibrated on an annual inspection and certified by an appropriate agency. When the scale and person responsible for recording the weight are not in the same location, the installation shall develop a formal procedure which shall be included in the installation-specific Helicopter Procedures Manual

4.1.7 Required Submitted Documentation to Mukamalah

Anytime a vessel is planning to work offshore or arrives in the Kingdom for Saudi Aramco and has a helideck installed, onboarding notification must be provided to Mukamalah's Safety & Risk Management Unit. As part of the notification, the following documents must be provided for review and approval before any flight operation:

- Helideck Inspection Report (Full Report)
- Helideck Inspection Certificate
- Helideck Inspection Non-Compliance Report
- Helideck/Helideck Equipment Drawing
- Helideck Perimeter Net Drop Test
- Helideck Operations Manual
- Helideck Friction Test Report
- Helideck Friction Test Certificate
- Helideck Landing Area plate
- Helideck Crew Training Certificates:
 - OPITO-approved HERTM / HERTL Certificates
 - IATA (or GACA) Dangerous Goods Training Certificates.

❖ **Note:** Any vessel that has a structure that exceeds 300 feet in height (above the water level) shall be documented during the inspection process and notified to Mukamalah during the onboarding process.

4.2 Communications

4.2.1 Language

All aeronautical communication shall be conducted in English.

4.2.2 Responsibilities

Normally the helicopter crew will contact the rig/vessel 15 minutes before arrival on the appropriate aviation frequency. This is to ensure that there is sufficient time for the HLO to prepare the helideck for landing. The helicopter crew may also provide expected passenger drops and pickups and any additional services required. When the helideck is cleared for landing by the HLO, the helicopter crew shall be notified. The HLO should also provide safety-related information, e.g. that the helideck may not be used due to an alarm, that the landing gear is not lowered, loose articles that may strike the rotor, or fluid leaks from the helicopter.

4.2.3 Establishing Radio Communications

Before establishing radio communications, one should ensure that:

- the correct radio frequency is being utilized.
- listen first so as not to interrupt ongoing communications.
- think about what you wish to say before transmitting on the radio.

If a radio call is not understood, it shall not be answered until the call sign has been repeated and understood.

If a station receives a call without being able to make out the identity of the caller, the following terminology shall be used:

“Station calling, this is Vessel 123, say again your call sign”.

4.2.4 Phraseology

During radio communication between the helicopter and a ground station, certain words, and expressions (known as phraseology) are used to ease understanding. The use of standard aviation phraseology is required.

Section 06 contains a list of Standard English expressions with their Arabic and Urdu equivalent.

4.2.5 Frequencies

The installation/vessel shall provide Mukamalah’s Safety & Risk Management Unit (SRMU) its official radio “Call sign”. For aviation communications, the installation/vessel will only use the registered installation name marked on the helideck for radio communications.

The installation/vessel shall maintain a list of clearly visible frequencies and telephone numbers used for Mukamalah Aviation operations in its radio room.

The helicopter frequency is used for:

- deck clearance
- wind direction and velocity
- pitch, roll, inclination, and heave rate
- any other information of importance to the safety of the flight

All other communications are to be conducted with Mukamalah Dispatch by telephone or email. All vessels are required to monitor Marine channel 11.

4.2.6 Notifications

Mukamalah Dispatch shall be notified:

- During periods of radio silence;
- When arriving or departing any location;
- Before commencing and after completion of jack-up/jack-down operations;
- When transiting between locations and expecting a flight.

Mukamalah's Safety & Risk Management Unit (SRMU) shall be notified:

- When arriving in the territorial waters of the Kingdom of Saudi Arabia;
- When departing the territorial waters of the Kingdom of Saudi Arabia;
- When any alteration or modification of the Helideck has been made.

4.2.7 VHF Main

The installation/vessel shall have two serviceable, aviation-type approved, fixed air band Very High Frequency (VHF) radio sets tuned to the correct frequencies for area traffic.

All VHF radio aerials shall be located on or adjacent to the helideck well clear of the obstruction-free and limited obstacle sectors and not infringing the 180° 5:1 falling gradient.

All VHF radios shall be connected to an emergency power supply or Uninterruptable Power Supply (UPS).

4.2.8 Non-Directional Beacon (NDB)

Installations/vessels are not required by Mukamalah to have a Non-Directional Beacon (NDB). However, where an NDB 'loop aerial' is installed around the helideck perimeter, it shall be correctly positioned within the limits of the perimeter safety net outer rail. The 'loop aerial' retrieval arrangement shall be installed in a manner that does not intrude into the perimeter safety net.

4.2.9 VHF Portable

The installation/vessel is required to have onboard at a minimum two serviceable, aviation-type approved portable air band VHF radios and headset (c/w belt and holster). One for use by the HLO and the other as a spare. A spare shall always be available, even when more than one member of the helideck team is using a portable air band VHF radio.

4.2.10 Radio Log

The installation/vessel is to maintain a radio log to record all communications with the aircraft, aviation dispatch, position reports, and departing passenger manifests. The radio log shall record at a minimum the date, time, nature of communication, and any supporting documentation.

4.2.11 Passenger & Cargo Manifest

Whenever passengers, luggage, and/or cargo are transported by helicopter, a passenger/cargo manifest must be completed and accompany the helicopter.

When the passenger/cargo manifest has been completed it is considered to be an official document and therefore subject to inspection by Mukamalah and Saudi Aramco Security.

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Whenever a face-to-face crew change is required, the passenger/cargo manifest must be submitted to Mukamalah Aviation Dispatch no later than 3 hours before scheduled aircraft departure. Any deviation from the 3-hour requirement will require (GSOD) Ground Support Operation Division Superintendent approval.

The manifest shall contain the following information:

- **Outbound** – for face-to-face crew changes only
 - Full name of each outbound
 - Identification number

- **Inbound**
 - Full name of each passenger (match with outbound for face-to-face)
 - Identification number
 - Weight of the passenger
 - Weight of the luggage (per person)
 - Weight of all cargo

4.3 Meteorological Equipment

4.3.1 Meteorological Equipment

The installation/vessel is required to have installed a weather recording instrumentation compliant with current CAP 437 recommendations. All equipment should be in serviceable condition and calibrated with up-to-date certificates from a certified agency.

Meteorological equipment provided on the Installation should include:

- At least one (preferably two) illuminated windsocks, plus a spare sock.
- A fixed anemometer with readout (wind speed and direction) in the radio room or other control point.
- An air temperature probe with readout in the radio room or other control point.
- A precision barometer and/or altimeter box for QNH and QFE readout in the radio room or other control point. Pressure readings should be corrected for helideck height.
- It is recommended that visibility and cloud base instruments be installed with readout in the radio room or other control point.

Meteorological equipment sensors should be located adjacent to the helideck, well clear of the obstruction-free and limited obstacle sectors, and unaffected by disturbances caused by helicopters and process emissions.

4.3.2 Manual Backup

A hand-held anemometer shall be stowed in the radio room or other control point.

4.3.3 Pitch / Roll / Heave / Inclination

Mukamalah requires all installations/ vessels with unstable helidecks to have installed a Helideck Monitoring System (HMS) which can measure Pitch, Roll, Helideck Inclination, and Heave Rate with readout in the radio room or other control point. The equipment should be in serviceable condition and calibrated with up-to-date certificates from a certified agency.

An unstable helideck is a helideck mounted on ships, floating production units, semi-submersible rigs, jack-up rigs when they are floating/moving, and other helidecks that are moving.

Operations will not be conducted to vessels or jack-up rigs and barges not attached to the sea floor which do not have a Helideck Monitoring System.

The Helideck Monitoring System provided on the Installation should include:

- Traffic light indication (Green Deck)
- Max Helideck Inclination
- Max Heave rate
- Max pitch UP/DOWN concerning horizon
- Max roll Starboard/Port concerning horizon
- Keep a historical record
- Have the ability to be interrogated or screenshot to be emailed

The installation/vessel shall have a documented formal procedure for monitoring parameters within its Helideck Operations Manual. When initial contact is made with an aircraft the Pitch, Roll, Helideck Inclination, and Heave Rate shall be provided to the helicopter crew.

Helideck Movement Definitions

- **Max pitch UP/DOWN concerning horizon:**

The largest pitch movement up/down over the last 20 minutes was measured in degrees concerning the horizon.

- **Max roll Starboard/Port concerning horizon:**

The largest roll movement starboard/port, over the last 20 minutes, measured in degrees concerning the horizon.

- **Max Helideck Inclination:**

The largest measured helideck inclination, over the last 20 minutes, measured in degrees concerning 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 the tops of two waves.

- **Max Heave rate (expression for Max Average Heave rate):**

Heave rate is the highest value (average heave rate meaning average speed from top to bottom or bottom to top of a wave) measured over the last 20 minutes.

4.3.4 Helideck Monitoring System

Radio Operator should be able to readily refer to all weather information and Helideck Monitoring System information.

- ❖ **If a facility has an operational HMS system installed, Mukamalah must provide a printout of the system main page which provides the information issued in 4.3 of this section, 30 minutes before the departure of the helicopter to their facility.**

4.3.5 Weather Observation

When clearing an aircraft to land, the wind direction and speed shall be provided to the helicopter crew. Wind direction shall be stated in degrees relative to magnetic North and wind velocity (speed) in knots.

Other relevant weather i.e. fog banks, variable winds, present rain showers, thunderstorm activity, lightning, variable visibility in different directions etc. shall also be provided to the helicopter crew.

4.4 Helideck Crew

4.4.1 HLOs & HDAs Training Requirements

The following valid OPITO Certified Training Courses are required:

- HLO - Helicopter Emergency Response Team Leader (HERTL).
- HDA - Helicopter Emergency Response Team Member (HERTM).

HLOs and the helideck personnel involved in the loading and unloading of cargo require a full IATA Dangerous Goods Awareness course (Aviation GI).

Records are to be maintained on board the vessel /installation for each person. Records shall be provided to the Aviation Safety and Compliance Unit for verification when requested.

4.4.2 HLOs - HDAs Responsibilities

It is the duty of the HLO to supervise and run normal operations on the helideck during helicopter visits. He shall ensure that:

- Supervise fire and crash team.
- Direct loading and off-loading of cargo.
- Supervise the loading and unloading of passenger baggage.
- Do not load any cargo until directed by the pilot.
- Inform the fire and crash rescue team of helicopter operations.
- Check the helideck for loose objects.
- Obtain the exact weight of passengers, baggage, and cargo, and log this information on the passenger manifest for the pilot.
- Necessary steps are taken to deny unauthorized persons access to the helicopter deck before take-off and landing.
- The deck and downdraft areas are cleared of loose objects, snow and ice, inflammable substances, etc.
- Necessary personnel are present and in a state of readiness.
- The helideck crew has been briefed on any special conditions before the arrival of the helicopter, especially on the arrival of unfamiliar types of helicopters or in the event of special operations.
- All equipment and instruments are in place and full working order.
- All crane operations have been stopped, the crane operator outside of the crane cab, and the cranes are correctly positioned in relationship to the free approach and departure sectors.
- Inform the crane operator to cease operations.
- Note: Cranes shall be cradled if possible before Helicopter landings and takeoffs. If unable to cradle the boom, the crane operator shall stand next to the crane cab in full view of the pilot.
- No obstructions or vessels within the 180° down area.
- Passengers are held in the passenger waiting area during landing/take-off and they are given guidance during disembarkation and embarkation.
- Supervise passengers entering and exiting the aircraft.
- Passengers are properly wearing their life vest.
- Assure life vests and seat belts are correctly worn.
- Passengers have fastened their safety belts.
- confirms the headcount of passengers onboard, informs the helicopter crew, and matches the manifest.
- No smoking is allowed in any aspect of helicopter flights or helideck operations.

-
- Any fluid/oil leakage found on the helideck after the helicopter has taken off must be immediately reported to the pilot.
 - The standby vessel, if provided, will be informed that helicopter operations are going to take place.
 - The firefighting equipment for the helicopter landing area is to be manned unless remote monitors are installed. If remote monitors are installed, the remote operation point must be manned.
 - Approaches/departures to/from the helideck shall be observed and helicopter pilots notified of any abnormalities or deviation noted from safe operations.

Before landing, the HLO or Radio Room shall maintain contact with the helicopter crew and inform whether the deck is clear for landing. Ref. 7.1.4 - Phraseology.

The HLO shall immediately report any form of deviation on the helicopter deck to his immediate superior/installation manager so that Mukamalah is informed of the situation.

The HLO shall be positioned to be able to observe (as best as possible) and closely monitor, landing and take-off. The HLO shall immediately inform the helicopter crew via radio or visually if any abnormal situation occurs.

The HLO is responsible for ensuring that the number of passengers on board matches the passenger manifest as provided by Mukamalah Dispatch. The manifest is to be provided to the helicopter crew upon arrival.

When sending cargo onshore, the HLO is responsible for verifying that Mukamalah Dispatch has approved its transport and that it has been manifested.

If dangerous goods are to be transported in helicopters from offshore destinations the installation/vessel has to ensure that the dangerous goods are packaged and labeled following the IATA DGR manual. The shipper's declaration and pilot notification form shall be provided to the helicopter crew.

4.4.3 HLO Helideck Operations

Approaching the Helicopter

- After the helicopter has landed and is ready for unloading, the helicopter crew will provide a thumbs-up.
- This indicates that the helideck crew has permission to approach the helicopter to carry out their tasks.
- The HLO will give the thumbs-up signal when all personnel have left the helideck and all objects have been removed.

Passenger Handling

- Arrival
 - Passengers shall remain seated with lifejackets on and wait to disembark until told to do so by the pilot, HLO.
 - Passengers shall exit the helicopter directly away from the side of the helicopter and then exit the heliport, or as directed, being mindful to keep clear of the tail rotor and the main rotors at the front of the helicopter.
 - The helideck crew shall unload baggage under the supervision of the HLO.
- Departure
 - The pilot shall be given a copy of the manifest with accurate weights, for outgoing passengers/cargo from HLO.

- Passengers, baggage, and cargo shall be loaded per the directions of the pilot and HLO.
- Passengers shall follow the directions of the pilot and HLO and be mindful to keep clear of the tail rotor and the main rotors at the front of the helicopter.
- Passengers shall wear lifejackets and ear protection, with seat belts fastened.
- The HLO shall check the closure of doors and the security of hatches.
- The HLO shall check for fuel and oil leaks.
- The HLO shall clear the Helideck before taking off.
- The HLO shall give the all-clear signal to the pilot before take-off.

Use of Wheel Chocks

The following procedure applies to all helicopters with a wheeled undercarriage during operations on fixed installations, mobile rigs, and vessels. Wheel chocks may be used at the helicopter crew's discretion and standard hand signals shall be used. (7.1.5 – Hand Signals)

Standard procedure:

- Wheel chocks shall immediately be put in place at the helicopter crew's request.
- Wheel chocks shall be placed in front and behind both main wheels.
- Wheel chocks are removed when the helicopter crew signals, "Remove wheel chocks".

Luggage Free Cabin

- Cargo (of any kind) is NOT allowed in the helicopter cabin.
- All forms of bags/ briefcases/ portfolios etc. are considered to be hand luggage and shall be loaded into the baggage compartment.

4.4.4 Manning Policy

Mukamalah Dispatch will deny services to any offshore manned facilities or vessels that do not have a Helicopter Landing Officer (HLO). It is a mandatory requirement for the HLO to meet the helicopter and manage the loading/off-loading, following the HLO guidelines. (GI 1310.003, 3.4.10)

A minimum of 1 HLO and 2 HDAs, in addition to fire crew, are required to be on the helideck during helicopter operations. Each shift must have a designated HLO (Helicopter Landing Officer), to meet landing aircraft.

4.5 Dangerous Goods

4.5.1 Qualified Personnel

The installation/vessel shall onboard an IATA-qualified person who will be designated as the shipper and packer for dangerous goods to be transported by air.

4.5.2 Documentation

The installation/vessel shall have on board:

- Shippers Declarations
- Checklists - Radioactive & Non-Radioactive
- Dangerous Goods Labels

4.5.3 Packaging

The installation/vessel shall have on board:

- UN Specification packages
- Inner packages available & match UN Spec marking
- Limited Quantity Packages
- Absorbent and cushioning material

4.6 Helideck Equipment

4.6.1 Chocks

At least a quantity of six rubber or NATO sand-bag type aircraft chocks should be provided on the Installation.

4.6.2 Tie Down Straps / Ropes

At least a quantity of six tie-down straps with a Safe Working Load (SWL) of approximately 12,000 lbs. (5000kg) should be provided on the Installation.

4.6.3 Helideck Status

Except in an emergency, a helicopter will not land unless a "cleared to land" message is received from the HLO/radio room. A helideck that is not marked as closed is therefore assumed safe to land on without any threat to the helicopter or personnel on the ground.

4.6.4 Prohibited Landing Marker

Prohibited Landing Marker shall be used when:

- The helideck is dangerous to land on (e.g., due to work in progress with loose objects, weakened structure, obstacles such as wires stretched above the helideck, etc.)
- Landing will present a danger to personnel on or near the helideck
- Another installation with a helideck is close by or alongside and only one of the helidecks is to be used



Note:

A temporary or permanently closed helideck shall be marked following an internationally accepted standard with a yellow cross on a red background. The marking should be painted on the deck or by using a painted canvas laid out and secured. The marking shall be placed over the "H" in the center of the helideck.

When the helicopter deck is marked closed the green perimeter lights shall be turned off.

4.6.5 Helideck Not Ready Marker (Cone Policy)

A cone shall be placed on an open helideck when no helicopter operations are expected to occur. The cone shall be removed only when the HLO is 100% ready to accept a helicopter for landing.



This cone means:

- Fire crews are ready;
- HLO/HDA and staff are ready;
- The crane is cradled or moved away from the helideck area;
- The Crane Operator shall be OUT OF THE CAB;
- Someone has walked helideck to ensure safety;
- The LAST task before clearing the helicopter to land is to remove the cone;
- The FIRST task after the last helicopter has departed is to replace the cone;
- The cone shall be of a crushable type to allow a helicopter to land in the event of a real emergency.

4.6.6 Windsock

Windsocks should be located adjacent to the helideck, well clear of the obstruction-free and limited obstacle sectors, and unaffected by disturbances caused by helicopters and process emissions.

The windsock must be:

- Easily visible;
- Mounted in an area minimally affected by turbulence from surrounding constructions;
- Single-colored (orange) or dual-colored orange/white, red/white or black/white, conically formed and of sufficient size;
- Illuminated during night operations.

4.6.7 Friction

The helideck shall have a surface that prevents the helicopter from sliding (non-skid) per CAP437 standards.

A friction test is required annually or as issued (validity) in the friction test certificate. Helidecks that fail a friction test must be resurfaced, and an additional friction test completed and passed. Friction tests have to be carried out by Mukamalah-approved companies for helideck services.

Records are to be maintained on board the vessel /installation. Records shall be provided to the Aviation Safety and Compliance Unit for verification upon initial entry into KSA and upon request.

4.6.8 Drainage

The helideck surface shall be of solid construction with drainage of 30.5cm for every 30.5m (1 ft /100 ft).

Each heliport shall be constructed with a helideck perimeter trench drain system sized to accommodate a minimum combined flow rate of the actual firefighting system plus the helicopter fuel spill without any accumulation on the helideck surface. All drain openings shall be covered with secured perforated covers to eliminate trip hazards.

Heliport drains shall be able to effectively drain all fluids from the heliport. Heliport drain systems shall be required to pass a five (5) minute drain test with two monitors flowing in a 90°-degree spray pattern at the actual flow rate.

4.6.9 Aircraft tie-down points

The helideck surface shall have sufficient aircraft tiedown points available suitable for aircraft utilized by Mukamalah. The tiedown points are to be flush mounted and in good condition, if the tiedown points are not flush mounted then the height cannot exceed 25 mm.

4.6.10 Rope Net

The helidecks shall **NOT** be fitted with a rope net. *Ref: Mukamalah Aviation Company.*

4.7 Helideck Markings

All helidecks shall comply with the relevant latest requirements of CAP 437 (as amended), Mukamalah and Saudi Aramco engineering standards and rules, and GACAR Part 138 regulations. Should there be any conflict the higher specification shall prevail.

If a secondary name is to be marked on the helideck, the lettering shall not be greater than 90 cm and should be located in such a manner as not to confuse it with the registered installation/vessel name.

4.8 Perimeter Safety Net

All perimeter safety nets shall comply with the relevant latest requirements of CAP 437 (as amended), GACA, Mukamalah, and Saudi Aramco rules (AA-036248), regulations, and guidelines. Should there be any conflict, the higher specification shall prevail.

4.8.1 Maintenance

The helideck perimeter safety net shall be subject to routine checks and maintenance, for the anticipated operating conditions. This shall include corrosion checks for plastic-covered wire systems and cord deterioration for polypropylene and sisal systems.

Perimeter safety nets shall be free from damage, deterioration, and corrosion (panel frames and netting), and are the panels properly aligned to ensure no gaps or excessive variations in the height of the outboard rails.

Perimeter safety nets with signs of damage, deterioration, or corrosion must be replaced and pass a perimeter net inspection test or drop test.

4.8.2 Perimeter Safety Net Drop Test

It is not within the scope or purpose of CAP 437 to provide detailed advice for the design, fabrication, and testing of helideck perimeter nets. Given the responsibility rests with the duty holder to ensure the net is fit for purpose and is subjected to a satisfactory inspection and testing regime, specific issues are addressed in the Oil and Gas UK

'Aviation Operations Management Standards and Guidelines. As such, Aviation requires that the duty holder provide evidence that the safety net is safe and is checked for integrity.

If a test is performed, a yearly drop test is to utilize a 125 Kg soft weight dropped from a 1-meter height to verify the load-bearing capability of the perimeter safety net. It is recommended to use the Helideck perimeter net sacrificial panel for the execution of the drop test

Records are to be maintained on board the vessel /installation. Records shall be provided to the Mukamalah SRMU for verification upon request.

4.8.3 Drop-Sown Area Coverage

The perimeter safety net shall cover all exposed drop-down areas around the helideck, including the access/monitor platforms, where appropriate.

4.9 Access

4.9.1 Helideck Exit Routes

Unless the heliport is a continuous extension of a rigged deck with unrestricted entry and exit to it, there shall be at least two (2) exit routes from the heliport. One (1) exit may be designated for emergency use only. A minimum width of 70cm should be provided for the emergency exit route.

All helideck exit routes are to be unobstructed, clean, and mechanically sound (no loose grating, anti-slip stair treads fitted, handrails secured and complete, etc.). In addition, all helideck exit routes shall include compliant stairways.

4.9.2 Handrails

Handrails should be provided for all helideck exit routes, they shall be painted to be conspicuous and should not infringe on the obstruction-free and limited obstacle sectors during helicopter landings and takeoffs.

Where collapsible handrails are fitted, they should be serviceable and with the ability to be properly secured in both the erected and lowered positions.

4.9.3 Safety Notices

The helideck shall be marked clearly and lit for reduced visibility or night operations.

Safety notices shall be provided at all access points to the helideck that correctly displays the hazards associated with helicopters and the mandatory personnel controls during helideck operations.

Each access to the heliport area shall be marked with warning signs in Arabic and English saying "Beware of the Tail Rotor."

Safety notices shall be following the Saudi Aramco Standard Drawing AA-036249 (as amended, both in English and Arabic).

4.9.4 Access Restriction System

There shall be an adequate system (e.g. frangible barrier, swing gate) installed at each access point to the helideck to prevent inadvertent and unauthorized personnel access.

4.10 Turbulence

The turbulent and thermal effects caused by structures, vents, flares, and various prime movers on the Installation can have a serious adverse effect on the aerodynamic performance and safe handling of helicopters during approach, landing, and taking off.

These effects should have been identified and quantified during Installation design and fully accounted for in helicopter operations by applying, as necessary, appropriate limitations and restrictions as determined by the technical committee.

Any subsequent changes from the 'as-built' design and operating parameters must be viewed critically, as follows:

- Is the airgap provided beneath the helideck following CAP 437, 'as designed' and is it kept free of obstructions?
- Have any permanent or temporary structural or equipment additions or changes (e.g. stacked containers in the airgap or on laydown areas adjacent to the helideck) been made to the Installation that may significantly alter the aerodynamic (turbulence) performance of the helideck? If so, have they been evaluated and Mukamalah's SRMU notified?
- Have prime mover, venting, or process operating conditions been changed (e.g. flairs/engines/gas turbines output or numbers online increased or decreased) to the extent that the thermal effects (hot and cold emissions) that may seriously impact helicopter operations on or around the Installation have substantially altered? If so, have they been evaluated, and Mukamalah's SRMU notified?

4.11 Obstruction Environment

The helideck obstruction environment shall comply with the relevant latest requirements of CAP 437 (as amended), GACAR Part 138, and Mukamalah's regulations and guidelines. Should there be any conflict the higher specification shall prevail.

If any obstruction penetrates the 210° obstruction-free sector (maximum 250mm above helideck level within 1000m), the 150° limited obstacle sector, or the 180° 5:1 falling gradient to sea (from the edge of the perimeter net) helicopter operations are to cease and the condition reported to Mukamalah's SRMU for evaluation.

Of particular concern is that all areas are to remain clear of all obstructions, in particular temporarily located equipment, containers, and loose materials.

All potential obstructions to helicopter operations (on the Installation and in the vicinity of the helideck) should be properly identified and marked following CAP 437 on the drawings provided to Mukamalah's SRMU.

4.11.1 Obstruction Markings

Any obstruction four feet or higher is a main rotor obstruction and must have a solid red arc one-third the rotor diameter of the largest helicopter expected to land there.

Any obstruction six (6) inches or higher is a tail rotor obstruction and must be marked with a three (3) foot solid red rectangular border.

Any obstruction on the deck less than six (6) inches high is a skid hazard and must be marked with an eight (8) inch red circular band.

4.12 Helideck Lighting

Helidecks that are to be used for night operations and/or in conditions with reduced visibility must have CAP 437 (as amended) compliant lighting.

All lighting (status lights, floodlighting, TD/PM Circle H) lighting and the perimeter lighting must be connected to the installation's emergency power supply and switchover time must, in the event of a failure of the main power supply, be no more than 10 seconds.

The emergency power supply shall be able to provide electrical power for a minimum of 30 minutes. In the event an emergency power supply is being used, flight crews must be notified.

4.12.1 General Lighting

General lighting along the access stairs and walkways to the helideck and the monitor platforms should have adequate illumination fit for purpose and be clean and serviceable condition.

Floodlighting around the Installation/vessel should be correctly positioned to ensure that stray light beams do not dazzle Pilots during helideck operations.

Light pollution around the helideck should be minimized to the greatest extent possible. All Lights should be provided with guards, be intrinsically safe, and be located so as not to be an obstruction.

4.12.2 TD/PM Lights (Aiming Circle H)

TD/PM Circle H lighting must be CAP 437 certified by UK CAA or CAAI. The UK CAA publishes an up-to-date list which is available on the CAA website.

4.12.3 Perimeter Lights

For night operations, green-led omnidirectional lights shall be used to outline the Helideck border.

Lights should be provided with guards, be intrinsically safe, and be located so as not to be an obstruction have perimeter lighting consisting of green lamps equally spaced at an interval of not more than 3 meters.

The perimeter lighting must not reach more than 15 cm above the level of the helideck.

4.12.4 Limit of Safe Landing Area

For night operations, red LED omnidirectional lights shall be used to outline the safe landing area. There should be a clear delineation between the safe landing area and perimeter lighting.

4.12.5 Floodlights

The helideck shall have a satisfactory shielded floodlighting arrangement so that the helicopter crews cannot be dazzled during the approach and landing phase. The floodlights are to be used at the request of the helicopter crew and if TD/PM Circle H lighting is installed turned off during takeoff and landing.

4.13 Obstruction Lighting

All potential obstructions to helicopter operations (on the Installation and in the vicinity of the helideck) should be properly identified and marked following CAP 437 on the drawings provided to Mukamalah SRMU.

Obstruction lights should be visible and in working order.

All obstruction lighting must be connected to the installation's emergency power supply and switchover time must, in the event of a failure of the main power supply, be no more than 10 seconds.

4.13.1 Structures (Greater than 15m Above Deck Level)

All structures 15m above helideck level (derrick, crane booms, cabins, or any other obstacle that represents a hazard to flying), shall be properly marked with omnidirectional red lights every 10m or by other means (e.g. base floodlighting) following CAP 437.

4.13.2 Highest Point

The highest point on the Installation shall be properly marked with an omnidirectional red light or by other means (e.g. base floodlighting) following CAP 437.

4.13.3 Cranes

All crane booms shall be properly marked with omnidirectional red lights every 10m or by other means (e.g. base floodlighting) following CAP 437.

All crane cabs must be fitted with a flashing Omni directional red light to indicate when in use (Day or Night).

4.14 Status Warning Light

A minimum of two (2) flashing omnidirectional red helideck status warning lights, visible to the helicopter crew from any direction of approach and on any landing heading, shall be installed in proximity to the helideck to serve as a visual aid to the flight crew that the helideck is closed.

The helideck status warning lights must not reach more than 25 cm above the level of the helideck.

The helideck status warning light shall be interlocked into the Emergency Alarm System and maintained in good working order.

The helideck status warning light shall also be capable of manual activation by the HLO or Control Room at the HLO's direction.

The helideck status warning light must be connected to the installation's emergency power supply and switchover time must, in the event of a failure of the main power supply, be no more than 10 seconds.

The helideck status warning light should be provided with guards, be intrinsically safe, and be located so as not to be an obstruction.

4.15 Fire Fighting

4.15.1 Fire Fighting

The installation/vessel shall ensure that the firefighting equipment is always in good working order and ready for use.

Note: In the event of an aircraft emergency landing, the helideck fire extinguishing system must not be activated before the helicopter landing. Activation, before the helicopter has landed, could lead to a loss of deck references for the helicopter crew.

The following firefighting requirements are the minimum requirements required by CAP 437 (as amended). It is the installation/vessels' responsibility to ensure that they comply with any additional requirements that may be mandated by any other Mukamalah or entity.

Foam concentrated and produced foam tests shall be successfully carried out annually and test certificates issued. Monitors are to be fully tested for water and foam operation annually and test certificates are issued.

A failed inspection or test of any firefighting systems shall be immediately reported to Mukamalah SRMU for evaluation. If it is discovered that a deficiency was not reported, Mukamalah will immediately stop all operations to the installation, resuming operations at its discretion only when all critical items have been corrected.

4.15.2 Foam Systems

At a minimum, a compliant 150-gallon Foam Bladder Tank Skid design should be used. This includes an ASME Code Section-VIII internally coal tar coated tank, 316L SS bolts, ¼-Turn Ball Valves, Foam Concentrate Piping, ASME Code Section-VIII Relief Valve, Foam Concentrate Level Indicator, Minimum 4-inch Foam Monitor/DIFFS Ratio Controller, Maximum 2.50-inch Foam Hose Reel Station Ratio Controller, 6-inch Foam Monitor/DIFFS Supply Manifold, and 3-inch Foam Hose Reel Station Supply Manifold.

The Helideck Foam Monitor System shall be designed to supply a minimum of 346 GPM at 75 psi Foam Monitor Nozzle Inlet Pressure to each of two (2) CAP-437 compliant Helideck Foam Fire Fighting System composed of either a Foam Monitor System or DIFFS Foam Water spray System with a minimum compliant design for the AW-139 Helicopters having a D-Value=17. Either Helideck Foam Fire Fighting System shall be supplied by a compliant 150-gallon Foam Bladder Tank Skid utilizing a 3% MIL Spec AFFF Foam Concentrate.

The overall capacity of the foam system should exceed that necessary for initial suppression and extinction of the fire. The system shall be able to provide Five (5) minutes of foam application capability for a solid plate helideck. In the case of a passive fire-retarding surface with a water-only DIFFS the discharge duration may be reduced to no less than three (3) minutes.

A minimum of 100% backup foam to allow for replenishment, as a result of operation of the system during an incident or following training or testing, shall be made available.

Calculation of Application Rate

ICAO Performance Level B foam: Application rate = $5.5 \times \pi \times r^2$

D24 - $(5.5 \times 3.142 \times 12 \times 12) = 2488$ liters per minute

D22 - $(5.5 \times 3.142 \times 11 \times 11) = 2091$ liters per minute

D20 - $(5.5 \times 3.142 \times 10 \times 10) = 1728$ liters per minute

D19 - $(5.5 \times 3.142 \times 9.5 \times 9.5) = 1559$ liters per minute

D18 - $(5.5 \times 3.142 \times 9 \times 9) = 1400$ liters per minute

D17 - $(5.5 \times 3.142 \times 8.5 \times 8.5) = 1248$ liters per minute

D16 - $(5.5 \times 3.142 \times 8 \times 8) = 1106$ liters per minute

D15 - $(5.5 \times 3.142 \times 7.5 \times 7.5) = 972$ liters per minute

D14 - $(5.5 \times 3.142 \times 7 \times 7) = 847$ liters per minute

ICAO Performance Level C foam (or seawater): Application rate = $3.75 \times \pi \times r^2$

D24 - $(3.75 \times 3.142 \times 12 \times 12) = 1696$ liters per minute

D22 - $(3.75 \times 3.142 \times 11 \times 11) = 1425$ liters per minute

D20 - $(3.75 \times 3.142 \times 10 \times 10) = 1178$ liters per minute

D19 - $(3.75 \times 3.142 \times 9.5 \times 9.5) = 1063$ liters per minute

D18 - $(3.75 \times 3.142 \times 9 \times 9) = 954$ liters per minute

D17 - $(3.75 \times 3.142 \times 8.5 \times 8.5) = 851$ liters per minute

D16 - $(3.75 \times 3.142 \times 8 \times 8) = 754$ liters per minute

D15 - $(3.75 \times 3.142 \times 7.5 \times 7.5) = 663$ liters per minute

D14 - $(3.75 \times 3.142 \times 7 \times 7) = 577$ liters per minute

ICAO Performance Level B compressed air foam: Application rate = $3.00 \times \pi \times r^2$

D24 - $(3.00 \times 3.142 \times 12 \times 12) = 1357$ liters per minute

D22 - $(3.00 \times 3.142 \times 11 \times 11) = 1140$ liters per minute

D20 - $(3.00 \times 3.142 \times 10 \times 10) = 942$ liters per minute

D19 - $(3.00 \times 3.142 \times 9.5 \times 9.5) = 851$ liters per minute

D18 - $(3.00 \times 3.142 \times 9 \times 9) = 763$ liters per minute

D17 - $(3.00 \times 3.142 \times 8.5 \times 8.5) = 681$ liters per minute

D16 - $(3.00 \times 3.142 \times 8 \times 8) = 603$ liters per minute

D15 - $(3.00 \times 3.142 \times 7.5 \times 7.5) = 530$ liters per minute

D14 - $(3.00 \times 3.142 \times 7 \times 7) = 462$ liters per minute

Minimum Operational Stocks

ICAO Performance Level B foam: 1% foam solution discharged over five minutes

D24 - $2488 \times 1\% \times 5 = 124$ liters

D22 - $2091 \times 1\% \times 5 = 105$ liters

D20 - $1728 \times 1\% \times 5 = 86$ liters

D19 - $1559 \times 1\% \times 5 = 78$ liters

D18 - $1400 \times 1\% \times 5 = 70$ liters

D17 - $1248 \times 1\% \times 5 = 62$ liters

D16 - $1106 \times 1\% \times 5 = 55$ liters

D15 - $972 \times 1\% \times 5 = 49$ liters

D14 - $847 \times 1\% \times 5 = 42$ liters

ICAO Performance Level C foam (or seawater): 3% foam solution discharged over five minutes

D24 - $1696 \times 3\% \times 5 = 254$ liters

D22 - $1425 \times 3\% \times 5 = 214$ liters

D20 - $1178 \times 3\% \times 5 = 177$ liters

D19 - $1063 \times 3\% \times 5 = 159$ liters

D18 - $954 \times 3\% \times 5 = 143$ liters

D17 - $851 \times 3\% \times 5 = 128$ liters

D16 - $754 \times 3\% \times 5 = 113$ liters

D15 - 663 x 3% x 5 = 99 liters

D14 - 577 x 3% x 5 = 87 liters

4.15.3 Dry Powder Complementary Agent

Dry powder shall be provided and is recommended as the primary complementary agent.

For helidecks, D16 or less the minimum total capacity of 23kg is required from either one or two extinguishers.

For helidecks D16 to D24 the minimum total capacity of 45kg is required from either one or two extinguishers.

For helidecks, D24 or larger the minimum total capacity should be 90kg delivered from either two, three, or four extinguishers.

Dry Powder agents should be readily accessible to the helideck.

4.15.4 CO2 Complementary Agent

CO2 agent shall be provided with a suitable applicator for use on engine fires.

For helidecks, D16 or less the minimum total capacity of 9kg is required from either one or two extinguishers.

For helidecks D16 to D24 the minimum total capacity of 18kg is required from either one or two extinguishers.

For helidecks, D24 or larger the minimum total capacity should be 36kg delivered from either two, three, or four extinguishers.

CO2 agents should be readily accessible to the helideck.

4.15.5 Back-up DP and CO2

A minimum of 100% backup DP and CO2 firefighting fire agent to allow for replenishment, as a result of the operation of the agents during an incident or following training or testing, shall be made available.

4.16 Rescue Equipment

4.16.1 Rescue Equipment Boxes

At all times the vessel/installation shall maintain all equipment required for operations in good working order.

The equipment must be stored so that it is readily available well-lit, visible, and in a safe place, preferably in a sealed locker or container. If the locker or container is locked with a key, the key must be placed behind a window of breakable material.

The locker or container shall be painted red and marked "Emergency Equipment" in English and Arabic.

4.16.2 Checklist

A checklist must be placed on the locker, listing all equipment inside and the last inspection date. The checklist should be displayed to be easily readable while accessing the Rescue Equipment box.

4.16.3 Required Contents

CAP 437 Required:

- One (1) x Adjustable Wrench
- One (1) x Bolt Cutter 36"
- One (1) x Large Crowbar
- One (1) x Hook, Grab or Salving
- One (1) x Hacksaw (heavy duty) and (6) six spare blades
- One (1) x 3m Ladder (two-piece)
- One (1) x Pliers, Side Cutting (sheet metal shears)
- One (1) x Set of assorted screwdrivers
- Two (2) x Rescue Axe, Large (non-wedge or aircraft type)
- Two (2) x Blanket, Fire Resistant
- Three (3) x Non-Corrosive Rescue Knives with Sheath (for cutting seat belts)
- Three (3) x Man-Made Mineral Fiber (MMMMF) Filter masks
- Three (3) x High Visibility Vests (Fire retardant with HLO/HDA in reflective material front and back or an alternative means of easy identification)

Mukamalah Required:

- One (1) x Hammer
- One (1) x Cutting Chisel
- One (1) x 3 m Boat Hook
- One (1) x Grapnel Hook attached to 50'ft braided 3/16 stainless steel cable
- One (1) x 50'ft Fire Retardant Rope, ½"
- One (1) x 100'ft Fire Retardant Rope, ½"
- One (1) x Wire Cutter
- Two (2) x Hooligan Tool 36"
- Two (2) x Blanket, Fire - Water-Gel
- Three (3) x Flashlights (Explosion proof) (Night Operations)
- A minimum of two, clean, fully charged, and properly serviced self-contained Breathing Apparatus (BA) sets complete with spare cylinders, provided in protective stowage lockers adjacent to the helideck.

- Stretcher suitable for use in helicopters.

The 3 m long boat hook, together with a light two-piece ladder of about 3 m in length, shall be stored in a suitable place near the locker or container holding the emergency equipment.

4.17 Protective Clothing

At all times the vessel/installation shall maintain the required firefighting gear in good condition. Firefighting gear shall be inspected for damage or worn before use. Firefighting gear has a maximum useful life of 10 years. If any damage, or manufacture date is older than 10 years or not is unreadable, the firefighting gear is to be replaced immediately.

4.17.1 Storage

The firefighting gear must be stored so that it is readily available well-lit, visible, and in a safe place in a locker or container.

The locker or container shall be painted red and marked "Firefighting Gear" in English and Arabic.

4.17.2 Firefighting Gear

The installation/vessel shall maintain a minimum of 3 full sets of firefighting gear.

Saudi Aramco FrPD does not allow the use of lightweight firefighting suits. All fire-fighting suits are to be compliant with the below listed standard codes.

- Helmet with visor - Code (EN443)
- Balaclava (Anti flash hood) - Code (EN)
- Gloves - Code (EN659)
- Boots - Code (EN345)
- Fire suit - Code (EN469/NFPA1971)

Helicopter Operations Manual

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5.0 HELIDECK OPERATIONS MANUAL

This Manual is mandatory and shall be constructed specifically in relationship to the facility and shall include but not be limited to the following subjects:

- **INTRODUCTION/GENERAL**

General information, including the following:

- Name of helideck owner/operator, and address, telephone number[s], and email at which the owner/operator can always be contacted;
- Name of Helideck Manager / Accountable Manager;
- Purpose and scope of the Helideck Operations Manual; and
- The condition for use of the helideck, including operational limitations and restrictions.

- **PARTICULARS OF THE HELIDECK**

The detailed information of individual helideck could be described in the Helideck Operations Manual.

- **ROLES, RESPONSIBILITIES AND COMPETENCY REQUIREMENTS**

- **HELICOPTER AND HELIDECK OPERATIONS**

- Introduction;
- Helideck Manning Level;
- Communication Equipment;
- Navigation Equipment;
- Flight Flow;
- Communication Procedures;
- Radio Silence Procedures;
- Crane Operations;
- Passengers Management; and
- Cargo Management.

- **HELIDECK REGULATIONS**

- Physical Aspects;
- Visual Aids;
- Firefighting and Rescue Facilities; and
- Personal Protective Equipment (PPE).

- **HELIDECK LIMITATION LIST**

Contents shall include:

- Details of Non-compliance (with photo when available);
- Mitigation; and
- Restriction or Penalty.

- **EMERGENCY RESPONSE PROCEDURE**

- Action during Emergency;
- Guidance on Emergency Actions:
 - Crash on the Helideck;
 - Crash on the Helideck, Major Spillage with No Fire;
 - Significant Fuel spillage, Rotor Turning;
 - Evacuation by Helicopter;

- Man Overboard;
- Emergency or Precautionary Landing;
- Inadvertent Wheel-up Landing;
- Helicopter Incident on Landing;
- Wrong Deck Landing;
- Fire on the Helideck/in the Helicopter;
- Helicopter Crash into the Water; and
- Emergency Landing;

- **INSPECTION AND MAINTENANCE OF THE HELIDECK AREA**

Particular procedures for the inspection and maintenance of the helideck area:

- Arrangements for routine maintenance and inspection;
- Maintenance of surface areas, markings, and drainage;
- Details of inspection intervals and times;
- Inspection checklist and logbook; and
- Reporting of inspection findings and correction actions;

- **HELIDECK ADMINISTRATION**

Particulars of the helideck administration, including:

- The helideck organizational chart showing the name and position of key personnel;
- The duty-list and responsibilities of key personnel, Offshore Installation Manager (OIM/PIC/Master);
- Helideck Landing Officer (HLO), Helideck Inspector, Medic and Helideck Radio Operator; and
- The name, telephone number, and email of the OIM.

Safety Posters

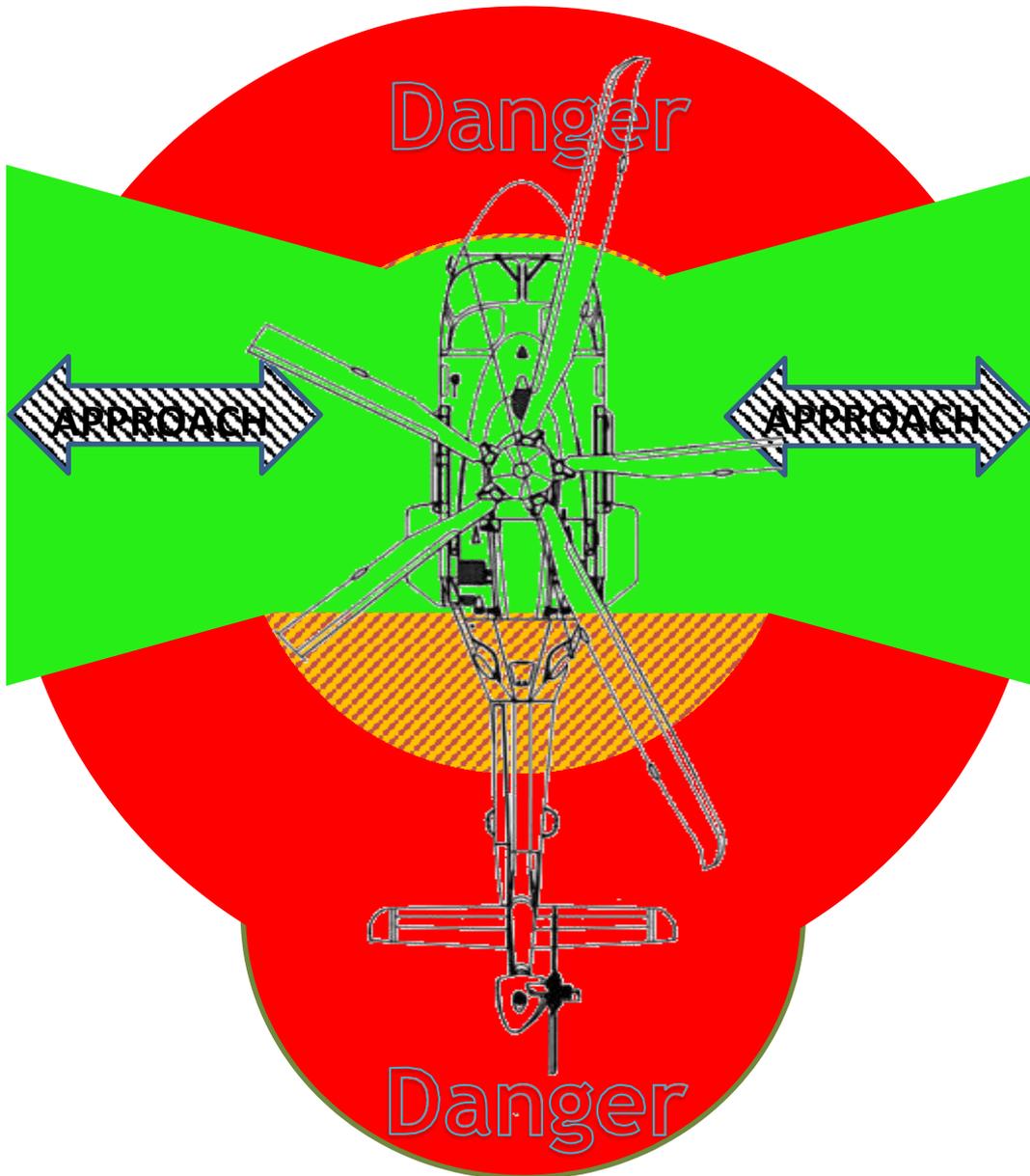
06

6.0 SAFETY POSTERS

This section provides safety posters which are to be displayed in the passenger briefing area and passenger waiting area if not co-located.

6.1.1 Agusta AW139

Helicopter Danger Zones



PASSENGER HANDLING

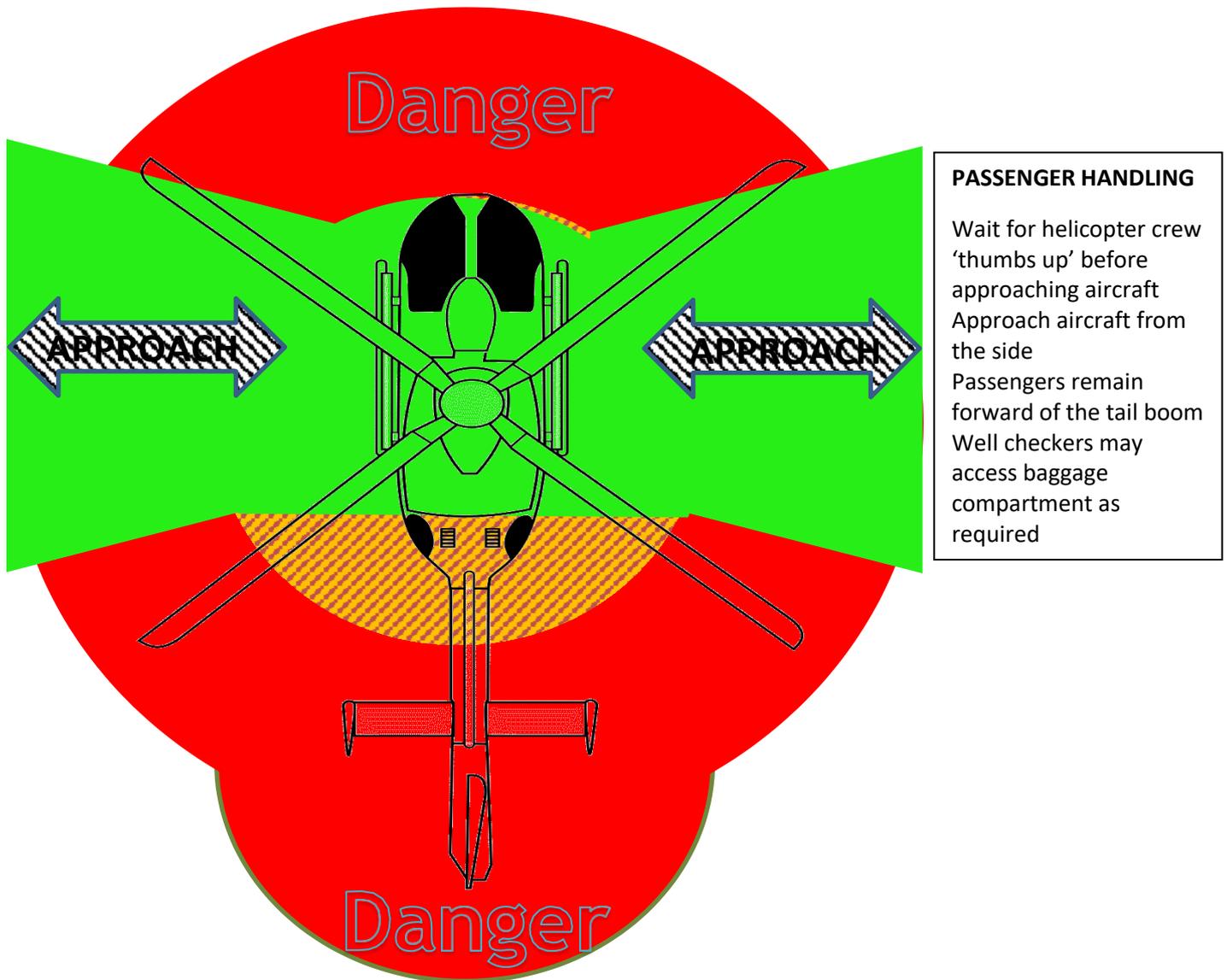
Wait for helicopter crew 'thumbs up' before approaching aircraft
 Approach aircraft from the side
 Passengers remain forward of the tail boom
 Well checkers may access baggage compartment as required

Crossing in front of the helicopter shall only be accomplished when at a safe distance from the main rotor and with permission from the helicopter crew

!! NEVER PASS BEHIND THE TAIL ROTOR OF THE HELICOPTER!!

6.1.2 Airbus H145

Helicopter Danger Zones



Crossing in front of the helicopter shall only be accomplished when at a safe distance from the main rotor and with permission from the helicopter crew

!! NEVER PASS BEHIND THE TAIL ROTOR OF THE HELICOPTER TO TRANSFER FROM ONE SIDE TO THE OTHER !!

PERSONNEL ACCESSING THE BAGGAGE COMPARTMENT SHALL USE CAUTION

Communications

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7.0 COMMUNICATIONS

This section contains procedures and guidelines for communication between the helideck crew and the helicopter crew.

7.1.1 Ras Tanura Area Operations

- VHF Drilling Rigs - 135.900 MHz
- VHF Barges - 135.900 MHz
- HF – Marine Ch 11
- Aviation Dispatch Tel: 013-673-4118

7.1.2 Tanajib Area Operations

- VHF Drilling Rigs - 135.975 MH
- VHF Barges - 135.950 MHz
- FM – Marine Ch 11
- Aviation Dispatch Tel: 013-378-2007

7.1.3 Guidance Communications for Radio Operators

Approximately 15 minutes before the estimated time of arrival (ETA), the helicopter crew will establish contact with the vessel for an update/exchange of:

- Position – Helideck well number/coordinates, if moving provide heading and speed, if relevant
- Number of passengers to drop
- Number of passengers to pick up
- Weather update
- Movements of the helideck, if relevant

When expecting an aircraft, the radio operator shall contact Aviation Dispatch one hour before the estimated time of arrival (ETA) to confirm the passenger manifest and update the current location.

Position

The position shall be given by the helideck well number, if no helideck is present at the current well number being drilled or if in transit in Latitude and Longitude in the following format (WGS84):

- N dd mm, mm E ddd mm, mm
 - d = degrees
 - m = minutes and decimals of minutes
- The heading is given in degrees (magnetic north)
- Speed is given in Knots

Passengers to drop

The number of passengers provided by the helicopter crew will be confirmed with the flight manifest received from Aviation Dispatch. If there is a discrepancy, contact dispatch by phone to resolve the issue. Any change to the flight manifest, such as a passenger swap just before the helicopter arrival, shall be cleared by dispatch.

Passengers to pick up

The number of passengers provided by the helicopter crew will be confirmed with the flight manifest received from

Aviation Dispatch. If there is a discrepancy, contact dispatch by phone to resolve the issue.

Weather conditions

The wind direction and speed shall always be given to the helicopter crew.

If the visibility is less than 5 SM and/or ceilings are less than 1000 ft, the helicopter crew shall be updated in the following format:

- Wind direction; given in degrees
- Wind speed, including gust; given in knots
- Visibility is given in statute miles (SM)
- Clouds or ceiling (FEW/BKN/OVC); given in feet above sea level
- Other information of interest to the helicopter crew like shower activity, fog, etc.

Movement of the Helideck

If the helideck is moving less than +/- 1 degree, (less than 1 to any direction from the horizontal plane), and the vertical movement (heave) is less than 1 meter, the helideck is defined as not moving. In this case, there is no need to forward these details to the helicopter crew.

Changes in weather conditions

If the weather changes, visibility, ceiling, the movements of the helideck, or other details of interest to the helicopter crew, this must be forwarded over the radio with no delay.

15min Before Arrival

Pilot

Vessel 123
Helicopter 7AH

HLO/Radio Room

Helicopter 7AH
Vessel 123

Pilot

Vessel 123
Helicopter 7AH
15 minutes to your location
Dropping 3
Picking up 2
Requesting landing clearance

HLO/Radio Room

Helicopter 7AH
15 minutes out
Dropping 3
Picking up 2
Current locations Zuluf 80
Wind 360 at 5 knots
(if >5sm vis or 100ft Ceiling)
Visibly 3 miles
Rain in the area
(if deck pitch or roll >1°)
Pitch 1°, Roll 2°, Heave 1.2 m/s

Pilot

Vessel 123
Helicopter 7AH
Standing by

5min Before Arrival / HLO is ready for helicopter.

HLO/Radio Room

Helicopter 7AH
Vessel 123

Pilot

Vessel 123
Helicopter 7AH

HLO/Radio Room

Helicopter 7AH
(if the weather changed) wind 270 at
10kt
Cleared to land on vessel 123

Pilot

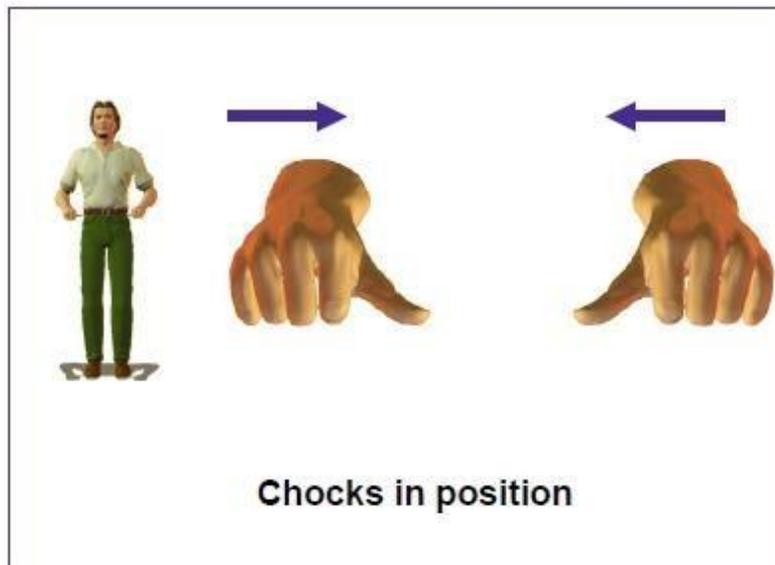
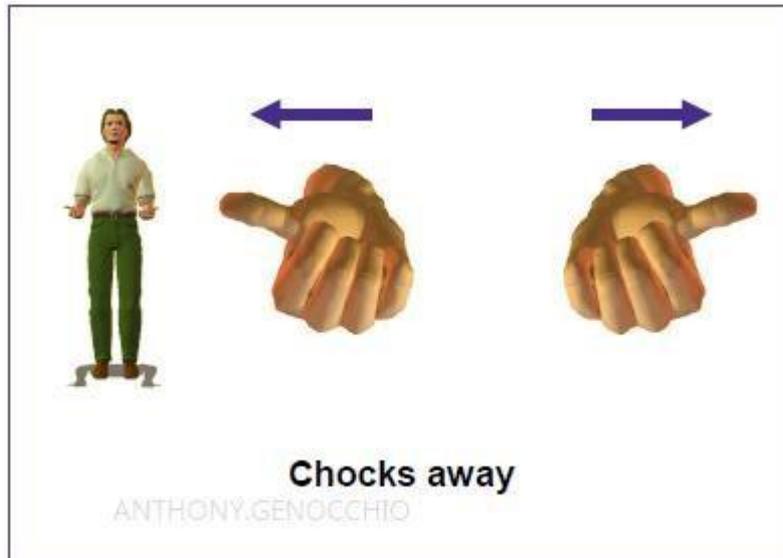
Vessel 123
Helicopter 7AH
Cleared to land

7.1.4 Phraseology

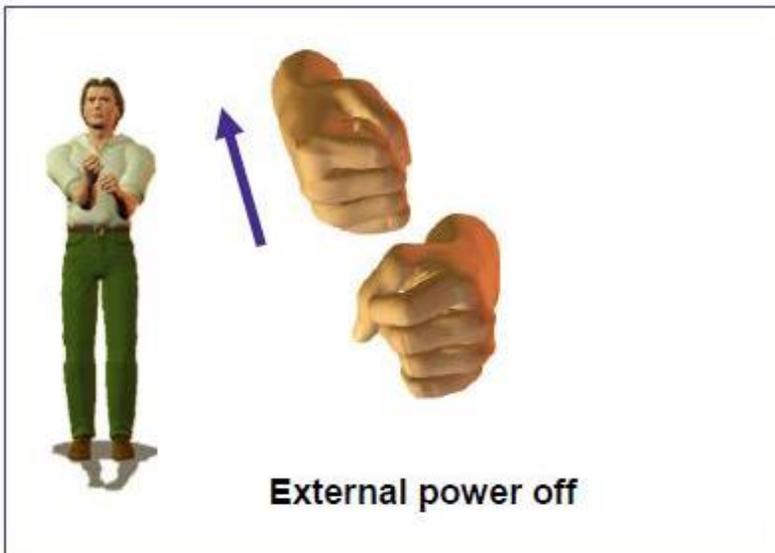
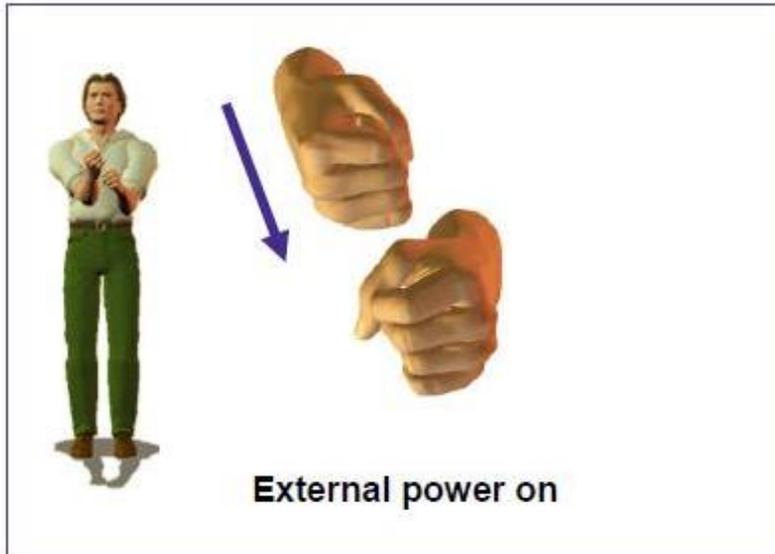
All radio communication must be done in English.

English	Arabic	Urdu
DO YOU READ	هل تسمعني	کیا آپ سن سکتے ہیں
MONITOR	تابع	دیکھتے رہیں / مانٹرن کرئیں
NEGATIVE	ال	نہیں
PASS YOUR MESSAGE	مرر رسالتيك	اپنا پیغام دیجیے
READ BACK	كرر ما لئده	میرا پیغام دہرائیں
ROGER	مفهوم	سمجھا
SAY AGAIN	كرر رسالتيك	دوبارہ کہیں
SPEAK SLOWER	تكلم ببطء	آرام سے / تھہر کہہ بولیں
STANDBY	اصبر	ٹھہرنے
VERIFY	أكد / تحقق	تصدیق کرائیں
WILCO	سأفعل ذلك	میں اس پہ کام کرونگا

7.1.5 Hand Signals Chocks



External Power



Engine Start



Rotors to Start Turning



Shutting Down/ Stop Refueling



OK



Aircraft Information

08

8.0 AIRCRAFT INFORMATION

This section provides a brief description of the helicopters that Mukamalah Aviation Company operates. The intent is to contribute to the knowledge of the HLO/HLA crew and ensure safe conduct in and around the aircraft.

8.1.1 Agusta AW-139

AW139 Specifications



- Twin Engine Helicopter
- Operated Single or Multi Pilot
- 12 or 14 Passenger Capability
- Hoist Capability
- Conventional Tail Rotor
- 17m D-Value
- Max Weight Offshore 7.0t (7,000kg)
- Baggage compartment door on either side behind the cabin
- **NEVER approach the helicopter from the front**
- **DO NOT let passengers walk around the helicopter**

AW139 Pitot Tube



CAUTION

> Do not touch the pitot tube

!! Hot !!

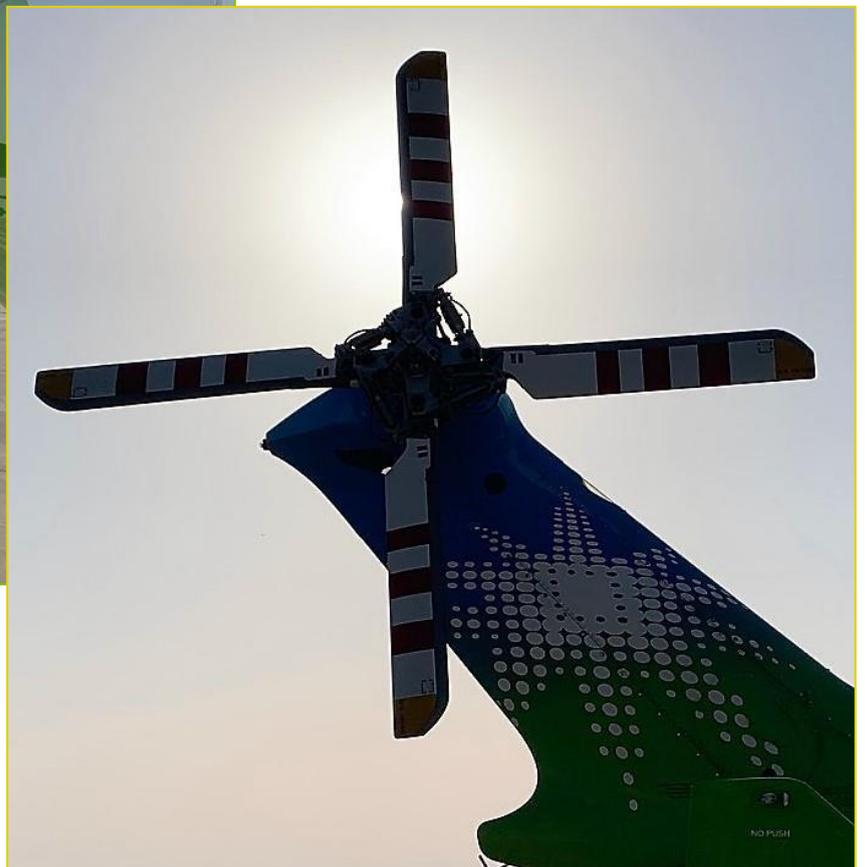


AW139 Conventional Tail Rotor



CAUTION

- > Even though the tail rotor is high, it can still cause harm
- > All HLO operations to remain forward of the horizontal stabilizer



AW139 Cabin Door Operation (Open/Close)



OPEN

- > Pull handle outwards
- > Turn door handle up and aft
- > Door will move outwards
- > Slide gently aft



CLOSE

- > Push and hold the door lock button
- > Slide door gently forward
- > Push door closed with hand
- > Turn the Handle forward and down

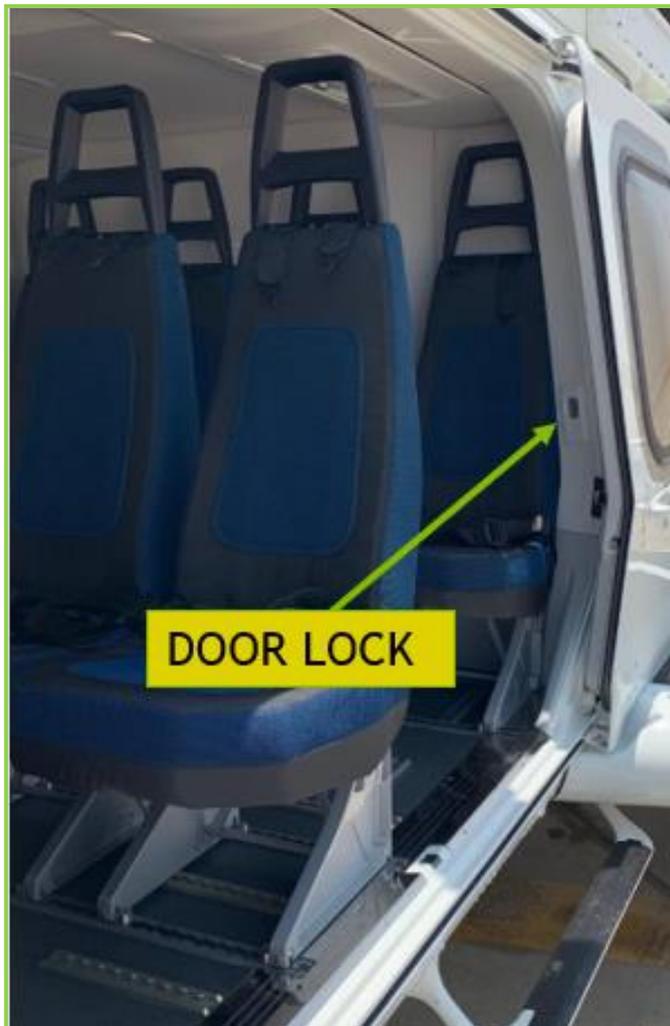


AW139 Open Door Lock

Operation



- Located in the Aft inside the door
- Door Locks in a fully opened position
- Two different door release mechanisms



- Gently push back on the Door handle and then Pull it outwards
- Push and hold the button to release the door
- **DO NOT PULL ON THE DOOR HANDLE BEFORE RELEASING THE DOOR LOCK MECHANISM**

AW139 Seats/Passenger Loading

3 Rows

Load the Front Seats First

If full, seat heavy passengers in front, and smaller passengers towards the back

Front row

- > 4 Seats
- > Rear Facing

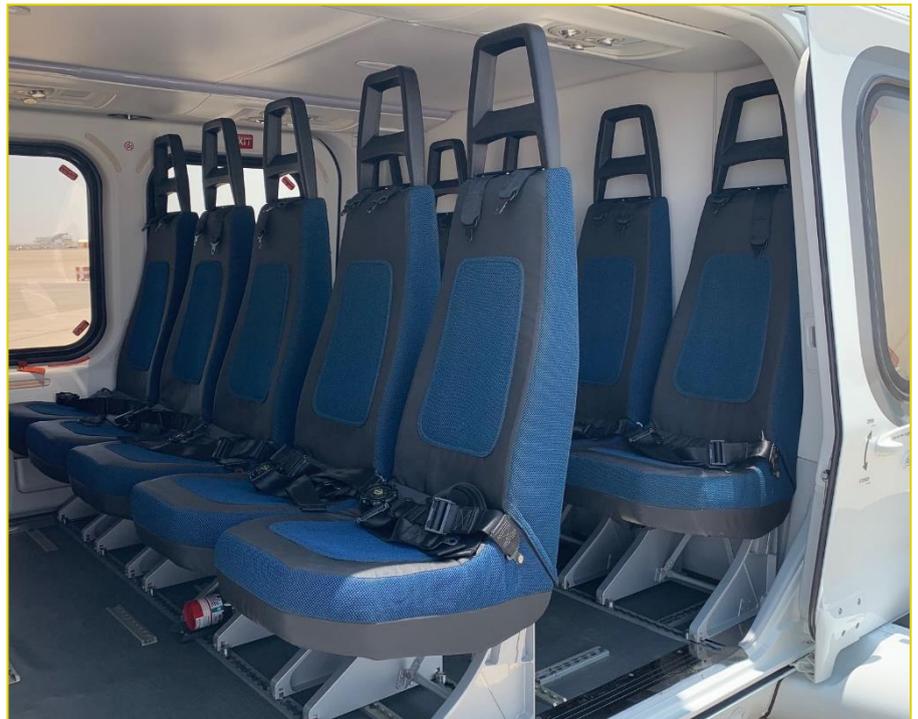


Middle Row

- > 4 or 5 Seats
- > Forward facing

Back Row

- > 4 or 5 Seats
- > Forward facing



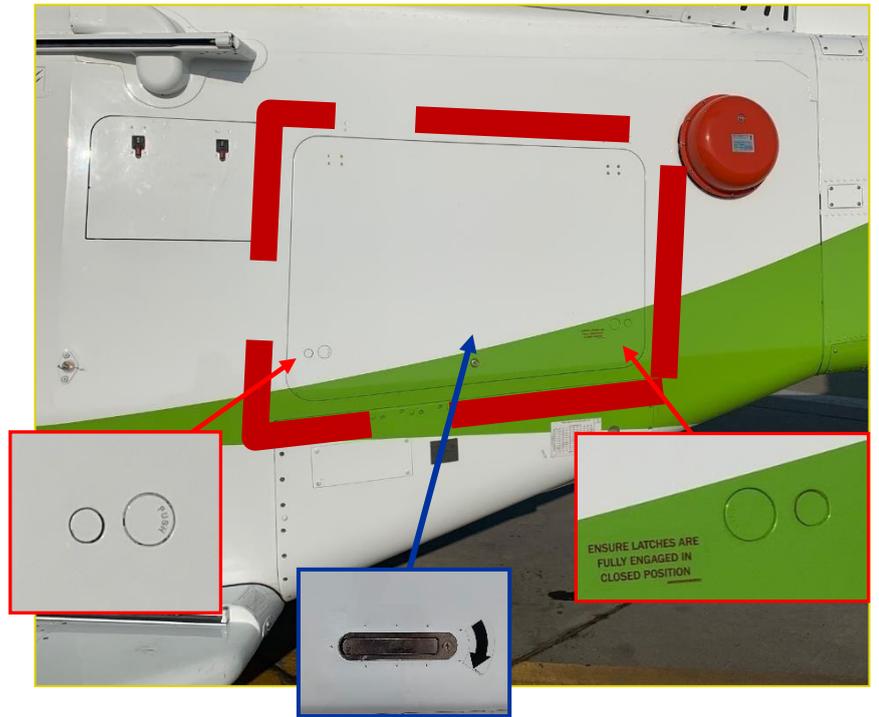
AW139 Seat Belts

- > Point Harness
- > Retractable shoulderharnes
- > Wear low across waist
- > First fasten lap belt and adjust, then attach shoulder straps



AW139 Baggage Compartment

- > Two doors
- > Located on either side aft of the passenger cabin before filling the tailboom
- > 2 latches or 1 handle to open/close baggage door
- > Doors hinge upwards



AW139 Baggage Compartment Door Operation (Open/Close)

Two Opening Mechanisms

Latch

OPEN

- > Press the PUSH section of both Latches
- > Maintain control of the door while It lifts to the open position

CLOSE

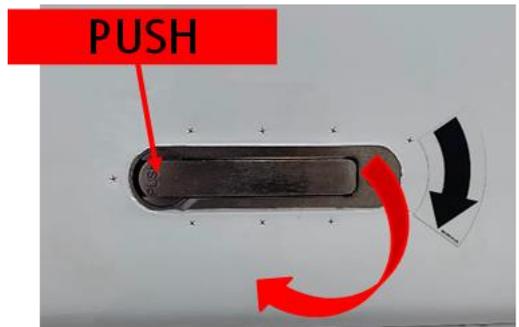
- > Pull the door down
 - **Hold Shut!**
- > Press the small section of both latches



Handle

OPEN

- > Press the PUSH section of the Handle
- > Lift and twist the handle to open the door
- > Maintain control of the door while It lifts to the open position



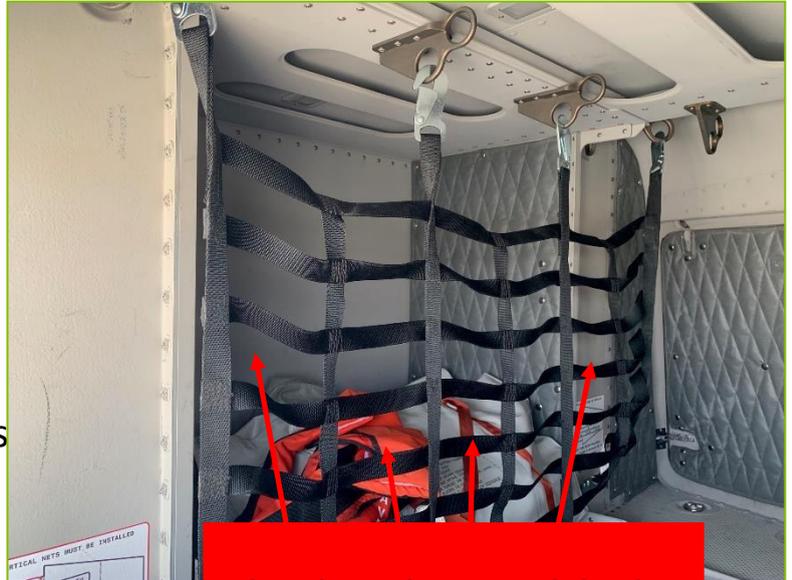
CLOSE

- > Pull the door down
 - **Hold Shut!**
- > Twist the handle to the closed position



AW139 Cargo Net

- > All baggage must be secured in baggage compartment
- > Do not place any baggage or cargo in front of the cargo net
- > Load from the front backward
- > Ensure no baggage, cargo or straps are hanging outside the baggage compartment door before closing



DO NOT LOAD BAGGAGE OR CARGO IN THIS AREA

- > **NO CARGO LOAD MUST PRESS AGAINST REAR DOORS**



Front to Back

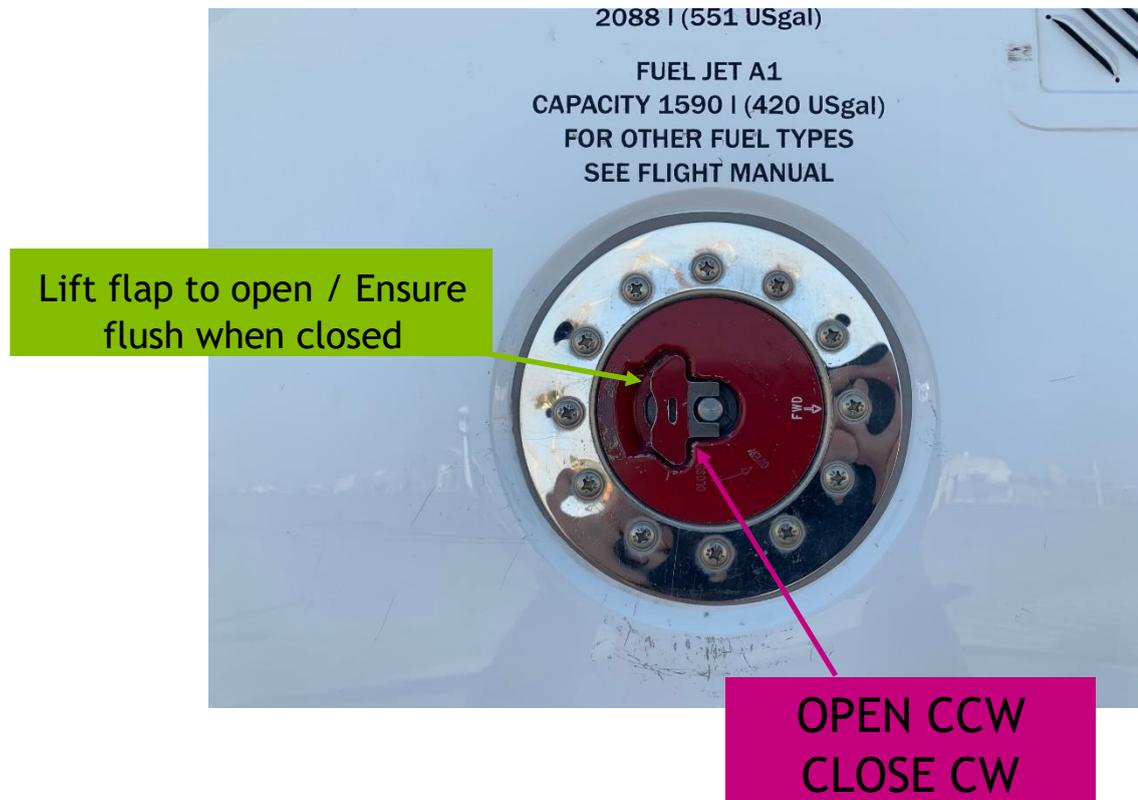
CAUTION
BAGGAGE EXTENDING OUTSIDE BAY AREA WILL DAMAGE BAGGAGE COMPARTMENT DOORS

AW139 Fuel Port**OPEN**

- Lift flap of cap
- Turn counter-clockwise
- Pull the flap to remove the filler cap

CLOSE

- Place filler cap over notches with an arrow pointing to the nose of the helicopter
- Turn clockwise
- Ensure the flap is flush with the cap



8.1.2 Airbus H145T2

H145 Specifications



- Twin Engine Helicopter
- Operated Single or Multi Pilot
- 8 Passenger capability
- Fenestron Tail Rotor
- 15m D-Value
- Max Weight 3.7t (3700kg)
- The baggage compartment door is located at the rear
- **NEVER approach the helicopter from the front**
- **Do NOT let passengers walk around the helicopter**

H145 Pitot Tube

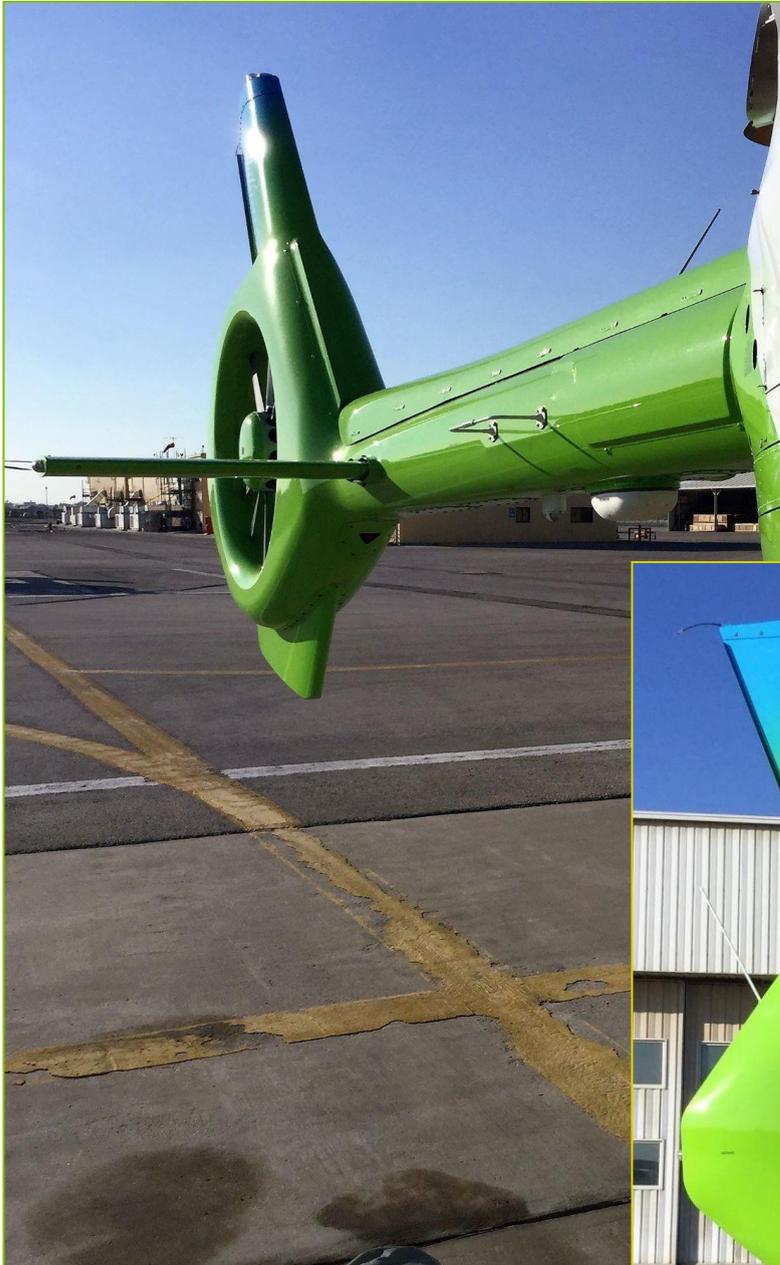


CAUTION

> Do not touch the pitot tube

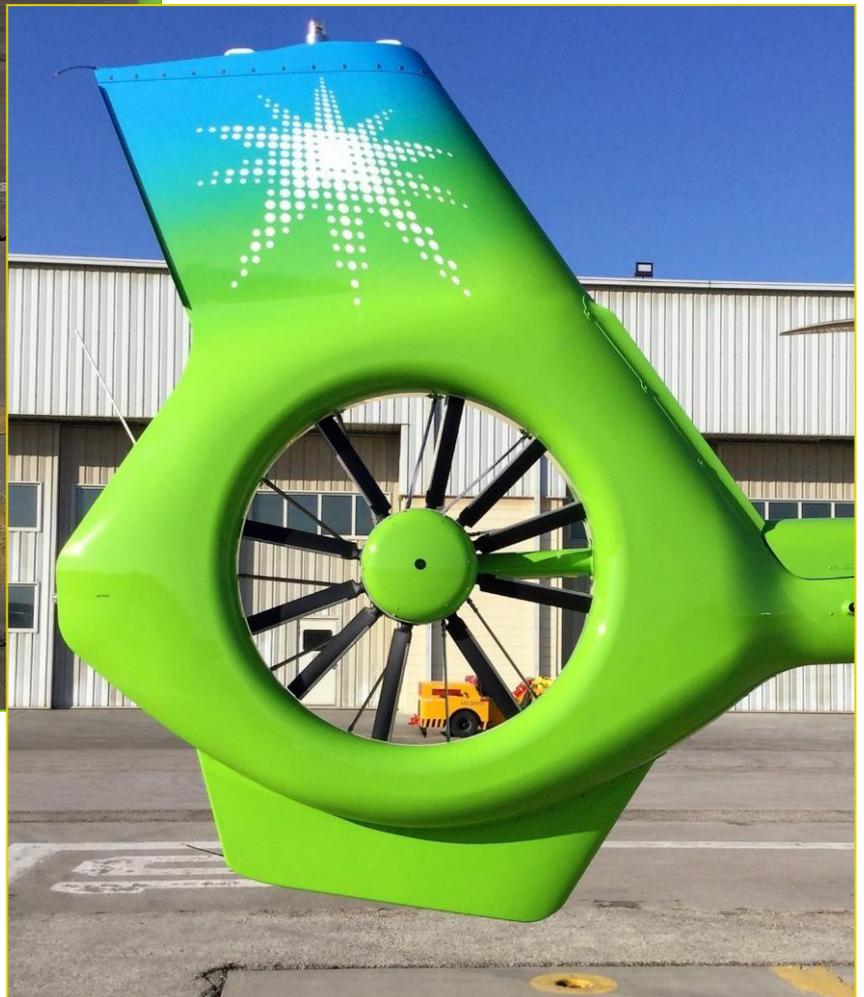
!! Hot !!

H145 FENESTRON Tail Rotor



CAUTION

- Tail Rotor protected by shroud
- Can still cause harm
- All HLO operations to remain forward of the horizontal stabilizer



H145 Cabin Door Operation (Open/Close)



OPEN

- > Turn door handle up and aft
- > Door will move outwards
- > Slide gently aft



CLOSE

- > Slide door gently forward
- > Push door closed with both hands
- > Turn handle forward and down

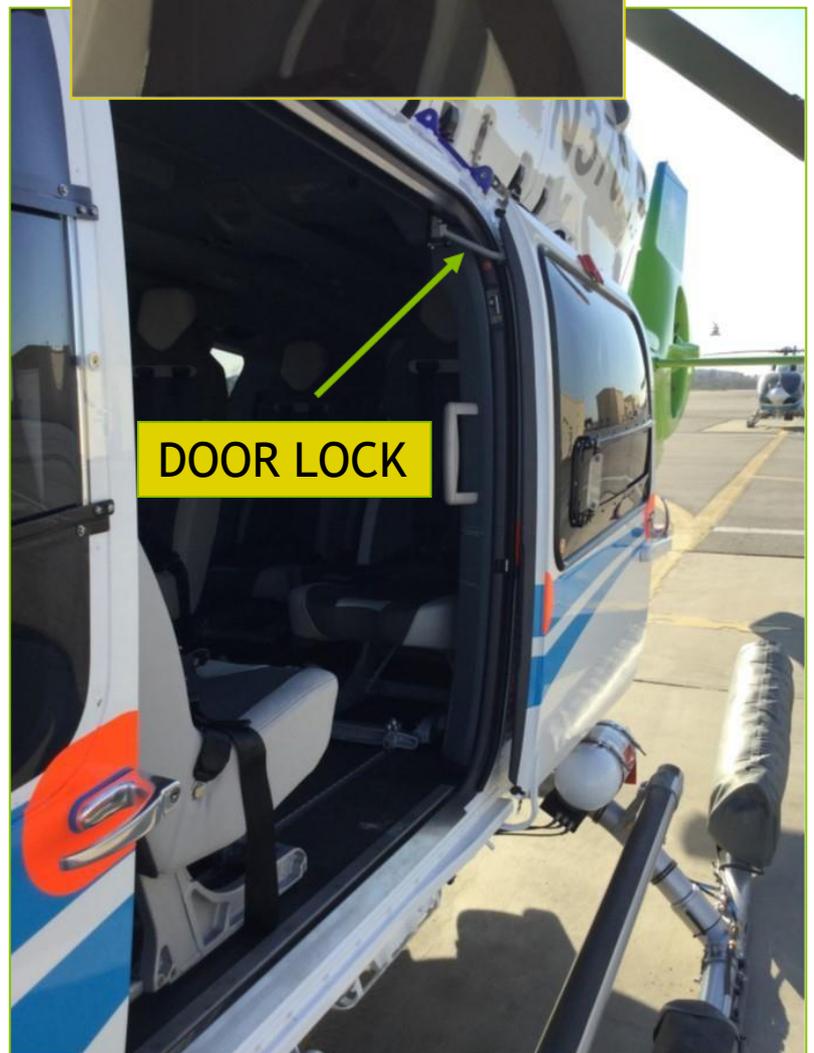


H145 Open Door Lock



**Only operate if instructed by
the helicopter crew**

- > Located aft top inside door
- > Pull down and turn
- > Ball out – unlocked
- > Ball aft - locked



H145 Seats/Passenger Loading

3 Rows

Load Front Seats First

If full, seat heavy passengers in front, and smaller passengers towards the back

Front row

- > 3 Seats
- > Rear Facing



Middle Row

- > 2 Seats
- > Forward facing



Back Row

- > 3 Seats
- > Forward facing

H145 Seat Belts

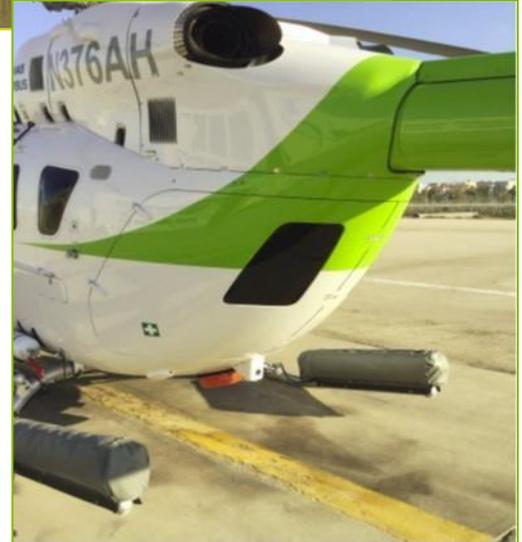
- Point Harness
- Retractable shoulder harness
- Wear low across waist
- First fasten lap belt and adjust, then attach shoulder straps

Ensure seatbelts are placed back on top of the seats and are not on the floor or hanging outside the doors



H145 Baggage Compartment

- Clamshell doors
- Located aft of the passenger cabin under the tail boom
- 3 latches to secure
- Doors hinge outwards



H145 Baggage Compartment Operation (Open/Close)

OPEN

1. Middle 1st
2. Bottom 2nd
3. Top 3rd

- › Press the PUSH section of the latch
- › Pull open latch
- › The latch will open by leaving the arm and hook over the left side
- › Open the right-hand door first, then the left-hand door



CLOSE

- › **Make sure nothing is hanging out of the baggage compartment**
- › Close the left-hand door first
 - **Hold Shut!**
- › Close the right-hand door after.
- › Ensure the hooks are in place before closing the latches

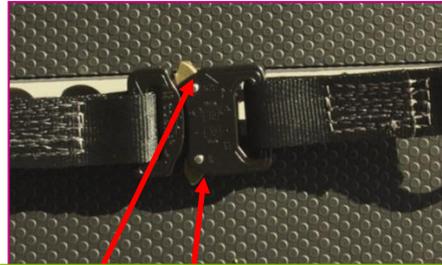
1. Middle 1st
2. Bottom 2nd
3. Top 3rd



Cargo Net

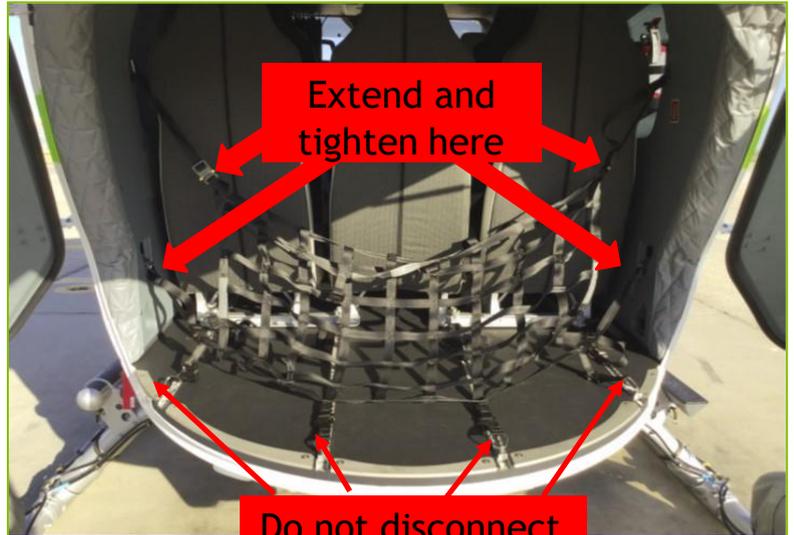
> All baggage must be secured in baggage compartment

- > Extend upper straps fully
- > If necessary release the net by un-buckling the two upper straps



ONLY

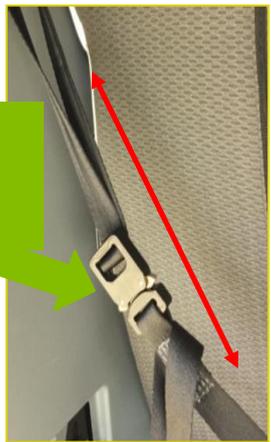
- > Place baggage in the bay, no higher than the baggage net
- > Replace safety net around baggage to secure
- > Re-buckle upper straps
- > Tighten straps
- > Ensure no straps are hanging outside the baggage compartment



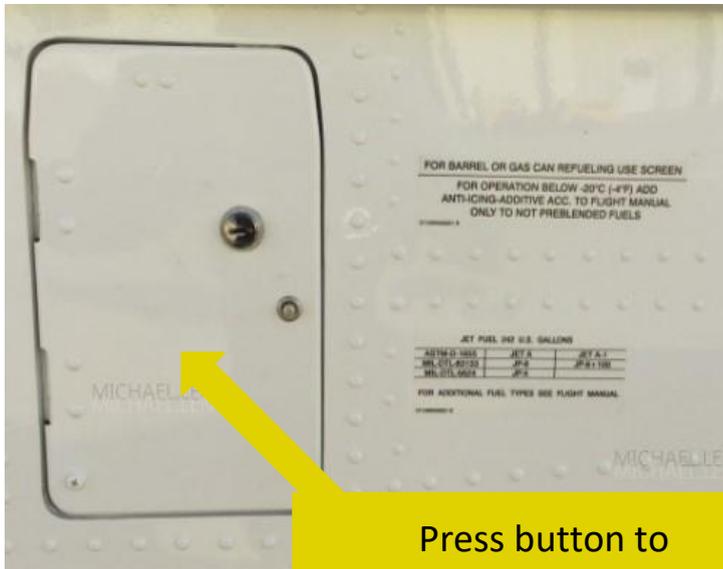
CAUTION
 BAGGAGE EXTENDING
 OUTSIDE BAY AREA WILL
 DAMAGE BAGGAGE
 COMPARTMENT DOORS



Extend/tighten strap. Similar to seat belts



H145 Fuel Port



Press button to open/lock

OPEN

1. Press the metal button on the door
2. Open door
3. Lift the flap of the cap
4. Turn counter-clockwise

CLOSE

1. Place cap over notches
2. Turn the cap clockwise until sealed
3. Ensure the flap springs back flush with the cap
4. Close Door
5. Push the metal button to lock

Lift flap to open/Ensure flush when closed



Abbreviations & Acronyms

09

9.0 ABBREVIATIONS AND ACRONYMS

AMSL	Above Mean Sea Level
CAFS	Compressed Air Foam System
CFD	Computational Fluid Dynamics
D-circle	A circle is usually hypothetical unless the helideck itself is circular, the diameter of which is the D-value of the largest helicopter the helideck is intended to serve.
D-value	The largest overall dimension of the helicopter when rotors are turning. This dimension will normally be measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane (or the most rearward extension of the fuselage in the case of Fenestron or Notar tails).
DIFFS	Deck Integrated Fire Fighting System(s)
DSV	Diving Support Vessel
Falling 5:1 gradient	A surface extending downwards on a gradient of 5:1 measured from the edge of the safety netting located around the landing area below the elevation of the helideck to water level for an arc of not less than 180° that passes through the center of the landing area and outwards to a distance of 1000m that will allow for safe clearance from obstacles below the helideck in the event of an engine failure for the type of helicopter the helideck is intended to serve.
FMS	Fixed Monitor System
FOD FPSO	Foreign Object Debris/Damage Floating Production Storage and Offloading units
FSU	Floating Storage Unit
H-ATO	Helideck - Approved Training Organization
HOIT	Helideck Operation Initial Training
Helideck	A helicopter landing area located on a fixed or floating offshore facility.
HDA	Helideck Assistant
HERT	Helideck Emergency Response Team
HLO	Helicopter Landing Officer
HMS	Helideck Motion System
HSE	Health and Safety Executive

IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ICS	International Chamber of Shipping
IMC	Instrument Meteorological Conditions
IMO	International Maritime Organization
ISO	International Organization for Standardization
Landing area	A generic term referring to the load-bearing area primarily intended for the landing and take-off of aircraft. The area sometimes referred to as the Final Approach and Take-Off area (FATO), is bounded by the perimeter line and perimeter lighting.
LED	Light Emitting Diode
LFL	Lower Flammable Limit
LOS	Limited Obstacle Sector(s). The 150° sector within which obstacles may be permitted, provided the height of the obstacles is limited.
MSI	Motion Severity Index
MTOM	Maximum Certificated Take-Off Mass
NMI	Normally Manned Installation – An installation that during normal operations is manned, such as installations that are permanently manned, installations that are manned for the majority of the work day with or without living quarters, floating installations, production installations, drilling rigs, and vessels.
NDB	Non-Directional Beacon
NM	Nautical Mile(s)
NUI	Normally Unmanned Installation
OFS	Obstacle-Free Sector. The 210° sector, extending outwards to a distance of 1000m will allow for an unobstructed departure path appropriate to the helicopter the helideck is intended to serve, within which no obstacles above helideck level are permitted. For helicopters operated in Performance Class 1 or 2, the horizontal extent of this distance will be compatible with the one-engine inoperative capability of the helicopter type to be used.
PCF	Post-Crash Fire

Perimeter D marking	The marking is located in the perimeter line in whole numbers; i.e. the D-value (see above) rounded up or down to the nearest whole number.
PPE	Personal Protective Equipment
RD	Rotor Diameter
RFF	Rescue and Fire Fighting
RFFS	Rescue and Fire-Fighting Services
Run-off area	An extension to the Landing Area designed to accommodate a parked helicopter; sometimes referred to as the Parking Area.
Shipboard heliport	A heliport is located on a vessel that may be purpose-built or non-purpose-built.
SHARE	Significant Heave Rate
TD/PM circle	<p>Touchdown/Positioning Marking Circle. Described as the Aiming Circle in earlier editions of ASD 904, the TD/PM Circle is the aiming point for a normal touchdown (landing) so located that when the pilot's seat is over the marking, the whole of the undercarriage will be within the landing area and all parts of the helicopter will be clear of any obstacles by a safe margin.</p> <p>NOTE: It shall be noted that only correct positioning over the TD/PM Circle will ensure proper clearance concerning physical obstacles provision of ground effect and provision of adequate passenger access/egress.</p>
UPS	Uninterruptable Power Supply
VMC	Visual Meteorological Conditions

Reference Material

10

10.0 REFERENCE MATERIAL

UK CAA	CAP 437 Standards for Offshore Helicopter Landing Areas - Version 9	February 2023
GACA	GACAR Part 138 - Certification, Authorization, and Operation of Heliports	Continuously Updated
Saudi Aramco	SAES M-005	
Mukamalah	GI 1310.003	
Saudi Aramco	AA-036248	
Saudi Aramco	AA-036249	
Oil & Gas UK	Helideck Perimeter Safety Nets – Issue 2	March 2008
Oil & Gas UK	Guidelines for the Management of Offshore Helideck Operations - Issue 6	March 2011

