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Air Operator Guidelines For Offshore Helicopter Operations

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Enquiries regarding the content of this publication should be addressed to HSAC Helideck Committee Chairman. For contact details, see HSAC Website (*http://www.hsac.org/membership-contacts*)

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1 BACKGROUND

1.1 Introduction

Offshore Helideck Departures and Arrivals are inherently complicated with inherent risk and therefore Offshore Helicopter Transport is considered a Hazard. For every safe flight this hazard is contained. The small landing surfaces, environmental conditions and vicinity to objects and obstacles associated with the offshore facility and its helideck layout result in many threats and consequences that might release the Offshore Helicopter Air Transport Hazard into an Offshore Helicopter Incident top event.

The complexity of offshore helicopter operations makes the depiction of all associated threats and consequences in a single Bowtie very comprehensive. Without pretending to be complete, the HSAC Helidecks Committee has developed a Bowtie that incorporates the major threats and consequences associated with offshore helicopter operations to a helideck. This Bow-Tie can be found in HSAC RP 191.

The tabular representation of controls, escalation factors and escalation controls in HSAC RP191 provides a paragraph reference to important information related to the specified Safety Critical Task (SCT) or Safety Critical Equipment (SCE) in an active HSAC Recommended Practice.

For controls and barriers resulting in Air Operator requirements from the Bow-Tie in HSAC RP 191, these have been compiled in the Recommended Practice before you.

Adopting the requirements in this Recommended Practice will assure continued effectiveness of the controls and barrier defined in HSAC RP 191.

1.2 Reading Guide

In order to simplify cross-reference between this RP and HSAC RP 191, each paragraph in this RP will include (a) reference(s) to the corresponding Bowtie control/barrier number(s) in HSAC RP 191. Additionally, a specific template was used developing each paragraph. This template consists of certain elements in each paragraph. These are the elements and their purpose:

1) Definition/Background Information. Relating back to the intent of the control/barrier referenced, either a definition of a certain term or concept might be applicable, or a simple introduction into the 'why' of a requirement that is stated later.
2) Air Operator Requirement. A short textual requirement for the air operator, which can be used to develop processes and procedures for inclusion into the air operators manual suite.
3) Specific details of requirements (if applicable). If multiple aspects are identified as part of the scope of the specified air operator requirement, they are individually specified.
4) Exceptions/Deviations (if applicable). In certain cases the air operator requirement cannot be complied with or an emergency situation might supersede the initial requirement. If such an exception or deviation scenario is identified, the conditions and potential alternative mitigation are mentioned.

2 REFERENCES

The following publications, recommended practices, and industry best practices have been taken into account / reviewed in the development of these guidelines and in some cases are cited herein. The most recent edition of the documents listed should be used, unless otherwise specified.

Organization	Reference #	Title
Federal Aviation Administration (FAA)	**FAA AC 29-2C**	Certification of Transport Category Rotorcraft
Helideck Certification Agency (HCA)	**HLL Part B Table 2**	Helideck Limitations List Part B Table 2 - Helidecks affected by turbulence.
Helicopter Safety Advisory Conference (HSAC) For all HSAC documents: *http://www.hsac.org/library*	**HSAC RP 2004-8**	HSAC Preferred Helicopter Equipment Fit
	HSAC RP 161	Recommended Practice for New Build Helideck Design Guidelines
	HSAC RP 162	Recommended Practice for Assessment, Upgrades, Modification, Replacement and Marking of Existing Helidecks
	HSAC RP 163	Inspection, Maintenance and Operation of Offshore Helidecks
	HSAC RP 164	Helideck Information Plates
	HSAC RP 191	Offshore Helideck Incident Bow-Tie
	HSAC Table Helicopter Design Criteria	Helicopter size and loading criteria (weight, dimensions, etc.) for helidecks is on the HSAC Web Site noted above under "Documents Library"
	HSAC Helideck and Fuel System Checklists	Located at the end of HSAC RP 163
International Air Transport Association (IATA)	**IATA DGR**	IATA Dangerous Goods Regulations (DGR) manual
U.S. Department of Transportation (US DOT)	**49 CFR**	49 CFR Chapter I - Pipeline And Hazardous Materials Safety Administration, Department Of Transportation
	14 CFR § 135.63(C)	Title 14 - Aeronautics and Space Chapter I - Federal Aviation Administration, Department of Transportation Subchapter G - Air Carriers and Operators for Compensation or Hire: Certification and Operations Part 135 - Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft Subpart B - Flight Operations § 135.63 Recordkeeping requirements.

3 TERMS, DEFINITIONS, AND ABBREVIATIONS

The following terms and associated definitions are used in this document. Additional detailed guidance is provided later in the document.

3.1 Terms and Definitions

Term	Definition
Air operator	An organization transporting passengers and cargo via aircraft for hire
Aircraft Accident	An aircraft accident is defined as follows: • The aircraft sustains damage or structural failure, which affects its structural strength, performance or flight characteristics, and would require a major repair or a replacement of an affected component. • Any serious injury or death incurred as a result of being on board or in direct contact with the aircraft from the time of boarding to the time of leaving the aircraft.
Automated Weather Observations System (AWOS)	A fully configurable airport/helideck weather system that provides continuous, real time information and reports on location weather conditions.
Center of Gravity (CG)	The point over which the aircraft would balance. The center of gravity affects the stability of the aircraft. To ensure the aircraft is safe to fly, the center of gravity must fall within specified limits established by the aircraft manufacturer.
Compliance	In the RP Compliance is linked to regulatory requirements that have to be met.
Compressed Air – Emergency Breathing System (CA-EBS)	A system that provides a way to extend time underwater using compressed air so that escape from a helicopter, which has capsized as a result of an attempted controlled ditching or an uncontrolled water impact, is achievable if not constrained by other factors.
Computational Fluid Dynamics (CFD)	A branch of fluid mechanics that uses numerical analysis and data structures to analyze and solve problems that involve fluid flows. In helideck design CFD studies can be used to identify impact areas over/around a helideck for turbulence, ambient air temperature increases and flammable gas dispersion.
Conformance/ Conformity	In this RP Conformance or Conformity is linked to the (voluntary) adherence with the standards and guidelines in this RP.
Controls	Hazards are prevented from causing losses by a series of mitigations, known as controls. Inadequate controls may result in a hazard release becoming an incident/accident.
Enhanced Operational Control (EOC) Program	An Enhanced Operational Control (EOC) Program is designed to provide procedures that will assist managers when making risk-based decisions regarding helicopter operations within their area of operation during periods of adverse weather or other operational scenarios that require increased management oversight.
Offshore Facility	Offshore platforms, vessels, ships and support systems such as oil and gas handling facilities, living quarters, offices, shops, cranes, electrical supply equipment and systems, fuel and water storage and piping, heliport, marine docking installations, communication facilities, navigation aids, and other similar facilities necessary in the conduct of offshore operations.

Term	Definition
Final Approach and Takeoff Area (FATO)	A defined area over which the final phase of the approach to hover or a landing is completed, and from which the takeoff maneuver is initiated and to compensate for permitted maneuvering. ***Note:*** *The minimum size of the FATO is 1D and the FATO shape should match the shape of the TLOF.*
Flight crew	Personnel who operate an aircraft while in flight. The composition of a flight crew depends on the type of aircraft and its mission.
Flight Management System (FMS)	A fundamental component of a modern aircraft avionics. An FMS is a specialized computer system that automates a wide variety of in-flight tasks, reducing the workload on the flight crew. A primary function is in-flight management of the flight plan. Using various sensors (such as GPS and INS often backed up by radio navigation) to determine the aircraft's position, the FMS can guide the aircraft along the flight plan.
Foreign Object Damage (FOD)	Any article or substance, alien to an aircraft or system, which could potentially cause damage.
Hazard	Any operational or technical situation, equipment, procedure, etc. with potential to cause damage or which presents a dangerous situation.
Helicopter	A rotary wing aircraft that depends principally upon the lift generated by one or more power-driven rotors, rotating on substantially vertical axes for its support and motion in the air. ***Note:*** *This document provides requirements and guidance for the design of a helideck for conventional helicopters with a single main rotor configuration only.*
Helideck Information Plate (HIP)	An informative document prepared by the helideck owner to advise pilots' on operational information required to safely use the helideck. A HIP contains items as helideck diagrams, communications, fuel capabilities, hazards, etc. Details for information mentioned and formatting of a HIP can be found in HSAC RP 164.
Helideck Monitoring System (HMS)	A system used to analyze helideck motion during helicopter landings to improve safety in hostile weather conditions. The HMS monitors helideck attitude and vertical velocity, wind speed and direction, air temperature and barometric pressure and presents this information to indicate landing conditions.
High reconnaissance	The process of assuring a safe landing environment prior to a helicopter landing at its intended destination. The purpose of conducting a high reconnaissance is to determine direction and speed of the wind, a touchdown point, suitability of the landing area, approach and departure axes, and obstacles for both the approach and departure. The pilot should also consider forced landing areas in case of an emergency.
Incident	An Aircraft Incident is defined as follows: • An occurrence other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operations
Inspection	An activity that is predominantly visual in nature, in which the condition of items are compared to a known standard.

Term	Definition
Line Operations Safety Audit (LOSA)	An audit to help develop countermeasures to operational errors. It involves a structured program of observation of front line activities built around the Threat and Error Management (TEM) concept. It aims to identify threats to operational safety, identify and minimize the risks which are the origin of such threats and implement measures to manage the human error aspects of the residual risk.
Line Oriented Flight Training (LOFT)	Training in a simulator with a complete crew using representative flight segments that contain normal, abnormal, and emergency procedures that may be expected in actual line operations. An instructor will monitor the crew's performance and review the simulated flight or flights with the crew afterwards to point out errors or good decisions that were made.
Manned Facility	An offshore facility that is normally manned.
Maximum Take Off Mass (Weight)	A maximum allowed helicopter mass (weight) on the helideck (TLOF) based on dynamic loads incurred during take-off and landings. MTOM is used interchangeably in many documents as MTOW and is depicted in either pounds (lbs) or metric tonnes (t).
Medevac	The evacuation of patients or casualties to the hospital in a helicopter or airplane.
Normally Unattended Installation (NUI)	An offshore facility that is normally unmanned
Obstacle	All fixed (including temporary and permanent) and moveable objects or parts of these that are located in an area intended for the safe movement of helicopters or extend above a defined surface intended to protect the helicopter or are located outside of those defined surfaces and have been assessed as a hazard to helicopters.
Offshore helideck	A physical platform on an offshore facility designed and used for helicopter landings and take offs.
Personal Locator Beacon (PLB)	A personal electronic transmitting device that is designed to alert potential rescuers to a life-threatening situation in the air, on water or in remote areas. When activated, the PLB sends out a signal on either a 406MHz frequency or Local Area System using 121.5MHz, VHF Digital Selective Calling (DSC) and/or Automatic Identification System (AIS).
Pilot in Command's (PIC)	The person aboard an aircraft who is ultimately responsible for its operation and safety during flight. The PIC must be legally certificated (or otherwise authorized) to operate the aircraft for the specific flight and flight conditions, but need not be actually manipulating the controls at any given moment. The PIC is the person legally in charge of the aircraft and its flight safety and operation, and would normally be the primary person liable for an infraction of any flight rule.

Term	Definition
Pitch, Roll and Heave (P/R/H)	Terms used to establish the limits of helideck movement on floating facilities which when exceeded may curtail helicopter operations. Other critical definitions used in establishment of P/R/H limits include the following: • **Pitch:** The angle between the absolute horizon and the plane of the helideck measured along the longitudinal axis of the facility. • **Helideck Roll:** The angle between the absolute horizon and the plane of the helideck measured along the lateral axis of the facility. • **Heave period:** "Heave period" is time in seconds between the top of two heaves. • **Helideck Inclination:** The largest angle between the absolute horizon and the plane of the helideck. • **Significant Heave Rate (SHR):** The average of the one-third highest values of instantaneous heave rate recorded during the previous 20 minute monitoring period. • **Measure of Motion Severity (MMS):** The instantaneous value of the ratio of the total acceleration in the plane of the helideck divided by the component of the total acceleration normal to the helideck. • **Motion Severity Index (MSI):** The maximum value of MMS expected during the next 20 minutes. • **Wind Severity Index (WSI):** The 10 minute mean free stream wind speed, corrected to correspond to the height of the main rotor of a helicopter landed on the helideck. An average main rotor height of 13 ft. (4 m) above the helideck surface is assumed. • **Relative Wind Direction (RWD):** The 2 minute mean free stream wind direction relative to the longitudinal axis of a helicopter landed on the helideck.
Safety Net	A netting section around the perimeter of the TLOF, and if applicable, the parking area and parking transition area, used to provide fall protection for personnel. ***Note:*** *Safety nets do not provide ground effect.*
Safety Shelf	A solid surface capable of providing ground effect around the perimeter of the TLOF and to provide fall protection for personnel.
Search and Rescue (SAR)	The search for and provision of aid to people who are in distress or imminent danger. The general field of search and rescue includes many specialty sub-fields, typically determined by the type of terrain the search is conducted over. These include mountain rescue; ground search and rescue, including the use of search and rescue dogs; urban search and rescue in cities; combat search and rescue on the battlefield and air-sea rescue over water.

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td>Sea State</td><td>Sea state is the general condition of the sea surface characterized in terms of a significant wave height, an associated wave return period and a wave energy spectrum. For aviation purposes, the World Meteorological Organization (WMO) has adopted the Douglas Sea Scale and provides the following criteria for sea state.
<table>
<tr><th>Sea State Code</th><th>Wave Height</th><th>Characteristics</th></tr>
<tr><td>0</td><td>0.0ft (0.0m)</td><td>Calm (glassy)</td></tr>
<tr><td>1</td><td>0.0ft (0.0m) to 0.3ft (0.1m)</td><td>Calm (rippled)</td></tr>
<tr><td>2</td><td>0.3ft (0.1m) to 1.6ft (0.5m)</td><td>Smooth (wavelets)</td></tr>
<tr><td>3</td><td>1.6ft (0.5m) to 4.2ft (1.25m)</td><td>Slight</td></tr>
<tr><td>4</td><td>4.2ft (1.25m) to 8.2ft (2.5m)</td><td>Moderate</td></tr>
<tr><td>5</td><td>8.2ft (2.5m) to 13.1ft (4.0m)</td><td>Rough</td></tr>
<tr><td>6</td><td>13.1ft (4.0m) to 19.7ft (6.0m)</td><td>Very rough</td></tr>
<tr><td>7</td><td>19.7ft (6.0m) to 29.5ft (9.0m)</td><td>High</td></tr>
<tr><td>8</td><td>29.5ft (9.0m) to 45.9 ft (14.0m)</td><td>Very high</td></tr>
<tr><td>9</td><td>Over 45.9 ft (14.0m)</td><td>Phenomenal</td></tr>
</table></td></tr>
<tr><td>Touchdown and Liftoff Area (TLOF)</td><td>The load bearing area of the helideck on which a helicopter may touchdown or liftoff.

Note: The minimum size of a TLOF is 0.83D: 0.83D is approx.. 1x Rotor Diameter (RD).</td></tr>
<tr><td>Touchdown/Positioning Marking (TDPM)</td><td>A yellow circle marking on the TLOF used by the pilot for guidance and obstacle clearance information while landing, taking off, or maneuvering.

Note: The TDPM is described as the aiming circle in some previous design documents.</td></tr>
</table>

3.2 Abbreviations

Abbrev.	Description	Abbrev.	Description
API	American Petroleum Institute	**HSAC**	Helicopter Safety Advisory Conference
ATA	Actual Time of Arrival	**HUET**	Helicopter Underwater Evacuation Training
AWOS	Automated Weather Observations System	**IATA**	International Air Transportation Association
CA-EBS	Compressed Air – Emergency Breathing System	**IFR**	Instrument Flight Rules
CFD	Computational Fluid Dynamics	**LOFT**	Line Oriented Flight Training
CFR	Code of Federal Regulations, or Crash-Fire Rescue	**LOSA**	Line Operations Safety Audit
CG	Center of Gravity	**NAA**	National Aviation Authority
DGR	Dangerous Goods Regulations	**NOTAM**	Notice to Airman
EOC	Enhanced Operational Controls	**NUI**	Normally Unmanned Installation
ETA	Estimated Time of Arrival	**NVG**	Night Vision Goggles
FMS	Flight Management System	**P/R/H**	Pitch/Roll/Heave
FOD	Foreign Object Damage	**PIC**	Pilot in Command
FPSO	Floating Production Storage And Offloading	**PLB**	Personnel Locating Beacon
FRC	Fire Retardant Clothing	**PLM**	Prohibited Landing Marker
H_2S	Hydrogen sulfide	**PPE**	Personal Protective Equipment
HCA	Helideck Certification Agency	**RFM**	Rotorcraft Flight Manual
HDA	Helideck Assistant	**RP**	Recommended Practice
HIP	Helideck Information Plate	**SAR**	Search And Rescue
HLL	Helideck Limitations List	**TDPM**	Touchdown Positioning Marking
HLO	Helicopter Landing Officer	**TLP**	Tension Leg Platform
HMS	Helideck Monitoring System	**WMO**	World Meteorological Organization

4 HELICOPTER EQUIPMENT

4.1 Helicopter Equipment Fit

Helicopter Equipment Fit Includes: Floats, Life Rafts, Emergency Locator/Transmitter (ELT), High-Back Crash Attenuating Seats, 4-point Harnesses, etc. *(C1.1)*

Certain helicopter equipment fit is essential for safe offshore helicopter operations as measures taken against risk or hazards in order to maintain a desired safe state. A consequence is a potential event resulting from the release of the hazard that results directly in injury, loss, or damage. Some offshore helicopter equipment either prevents unwanted consequences, minimizes the impact of these consequences or improves recovery from an unwanted event.

Air Operators shall refer to HSAC RP 2004-8 HSAC Preferred Helicopter Equipment Fit prior to assuming offshore helicopter operations.

5 ARRIVAL PROCEDURES

5.1 High Reconnaissance

Air Operator to perform a high reconnaissance prior to landing (Crane Boom)	*(3.2.1.5)*
Air Operator to perform a high reconnaissance prior to landing (Crane Operating Lights)	*(3.3.2.4)*
Air Operator to perform a high reconnaissance prior to landing (Vessel nearby, Work Near helideck, Other conflicting activities)	*(4.1.2.2)*

High reconnaissance is the process of assuring a safe landing environment prior to a helicopter landing at its intended destination. The purpose of conducting a high reconnaissance is to determine direction and speed of the wind, a touchdown point, suitability of the landing area, approach and departure axes, and obstacles for both the approach and departure. The pilot should also consider forced landing areas in case of an emergency.

Air operators shall document and implement procedures to perform a high reconnaissance prior to landing on an offshore helideck. As a minimum, the high reconnaissance shall contain the following elements:

1. Determination of potential crane booms in helicopter area of operation or infringing on approach of landing path
2. Determination if cranes are operating by scanning for crane operating lights indicating cranes under power
3. Determination of Vessels operating nearby and its possible impact on approach, landing, go around or emergency operations
4. Determination of work activities on or near the helideck that can potentially impact safe landing
5. Determination of other activities or obstructions that can potentially impact safe landing

In case of emergency where timeliness of landing the helicopter safely is crucial and performing a high reconnaissance could impair the safe landing, the high reconnaissance could be omitted at the Pilot in Command's (PIC) discretion.

5.2 Communications with Helideck

5.2.1 Ability for Pilot to Challenge by Radio

Ability for Pilot to Challenge by Radio	*(3.2.1.4) and (5.4.4.1)*

Two-way communications between flight crew and facility helideck team is crucial for safe helideck operations. Any safety related discrepancies, or anomalies shall be communicated instantly to the other party to maintain safe operations. These communications are called challenges.

Air Operators and Facility Owners shall have procedures in place that require challenges to be made by radio in the event of safety related observations before, during, or after helideck operations.

A safety related observation could be any hazard a flight crewmember or helideck team member observes. As a minimum, the following mandatory challenges shall be covered:

1. A flight crewmember observes that helideck status lights are not switched off when a 'Green Deck' is provided by the HLO.
2. A flight crewmember observes that a Crane Boom infringes on Helicopter Operating Area (not cradled or in the authorized safe position).

5.2.2 Verification procedures between Pilot/HLO

Cross check Pilot/HLO *(15.4.2.3) and (2.3.1.3)*

Another form of verification is the confirmation of data by the receiver of a two-way communication. This process is common use between flight crewmembers, usually using checklists and confirming that a step was completed. Between helideck team members and flight crew, the same procedure shall be practiced to avoid safety occurrences, lapses or any other deviation from standardized processes and procedures.

Air operators and facility owners shall have verification procedures in place for safety critical data between flight crew and helideck team.

As a minimum, the following mandatory verification scenarios shall be part of these procedures:

1. (Un) chocking confirmation by the flight crew upon radio or hand signal communication from a helideck team member.
2. Confirmation of Sea State and Weather Conditions prior to flight (dispatch criteria under EOC) and before landing (actual weather information from the facility weather equipment) between flight crew and helideck team member.

5.2.3 HLO Announcement of P/R/H in 20 min and 5 min Calls

HLO Announcement of P/R/H in 20 min and 5 min Calls *(2.1.4.3)*

Pitch/Roll/Heave Monitoring is necessary for all facilities that have a helideck that can move (e.g. FPSO's, TLP's, vessels, etc.). Landing in conditions where P/R/H exceeds mutually agreed limits therefore needs to be prevented. P/R/H limits of the facility's HMS should align with the Air Operators limits mentioned in the Operations Manual. Additionally, flight crew should be notified of actual P/R/H landing conditions in advance of arrival during the 20-minute and/or 5-minute call. (For more information See HSAC RP 163 Par 8.16)

Air Operator shall have P/R/H limits documented in their Operations Manual. In addition, flight crew need to be trained and competent to land a helicopter in conditions that meet these documented limits. P/R/H information shall be requested from each applicable offshore landing location prior to start of flight (Daily Status Report), and actual conditions shall be provided by the HLO during the 20-minute and/or 5-minute radio call. If this information is not provided during these radio calls, the flight crew shall challenge the HLO.

Facility owners shall document and implement procedures for their helideck team members to provide accurate P/R/H information to flight crew during the 20 minute and/or 5 minute radio calls, in addition to

providing a Daily Status Report to the Air Operator each day. (See HSAC RP 163 Attachment 6 – Helideck Daily Status Report)

Certain offshore mission types may require flight crew to be trained and competent to service offshore helidecks with less restrictive P/R/H limits, for example SAR, Medevac, etc. In these cases both, the limits for these mission types and the associated training and competency checks shall be documented in the Air Operators Manual suite.

5.2.4 HLO Procedure to Provide Wind Speed/Direction on 20 min/5 min call

HLO Procedure to Provide Wind Speed/Direction on 20 min/5 min call (15.3.3.3)

Accurate wind information at the landing facility is crucial for a safe landing. Sometimes information can be gathered from an AWOS or from a windsock (which should be illuminated for night operations); however direct information provided to a flight crew member by radio from a helideck team member or the facility's control room should be part of the standard operating procedures.

Facility owners shall document and implement procedures for the control room and/or a helideck team member to provide accurate wind speed and direction information to a landing helicopter's flight crew by radio during either the 20-minute or the 5-minute call.

Air operators shall document and implement procedures to challenge the facility when accurate wind information is not received during either the 20-minute or the 5-minute call.

When wind information is not provided, an illuminated windsock can also provide this information to the flight crew.

5.2.5 HLO to Provide Wind Information from Center Of Helideck Using Handheld Anemometer

HLO to Provide Wind Information from Center Of Helideck Using Handheld Anemometer (15.3.1.2) and (15.3.2

In accordance with HSAC RP 163 (Par 7.6.1.2), each manned offshore helideck shall have a handheld anemometer available. This handheld device is a back-up instrument for failing or unserviceable weather equipment on the facility; however it can also be used as an extra, more detailed, wind instrument that provides wind direction and wind speed information accurately from the center of the helideck. This information improves the decision making for flight crew for the helicopter configuration and alignment before landing.

Air Operators shall have documented procedures to use wind information provided by the offshore helideck team with a handheld anemometer from the center of the helideck during the 20-minute, or 5-minute call to improve decision making for flight crew for helicopter configuration and alignment before landing. If wind information is not provided during these calls, flight crew shall challenge the HLO and request wind speed and wind direction information.

If accurate wind information using the handheld anemometer cannot be provided, the windsock or alternative acceptable means of receiving wind information shall be used.

5.2.6 Pilot Notification during 20-min and 5-min call

Pilot Notification during 20-min and 5-min call *(4.1.2.1) and (4.2.1.4)*

Certain threats on or around the helideck operating area are identified by either markings or lighting (e.g. perimeter line marking to delineate the safe landing area, or a crane operating light to indicate that a crane is in operation, etc.). Usually, existing threats will be identified on the Helideck Information Plate (see HSAC RP 164), or in a NOTAM, and used during the pre-flight planning process. When either of these threat indications are degraded, or not functioning, or a newly identified threat is present, the HLO shall communicate the threat affecting the helicopter operating area to the flight crew of the landing helicopter by radio during the 20-minute or 5-minute call.

Air Operators shall have documented procedures to accept and use provided threat information from the HLO during the 20-minute, or 5-minute call to improve decision making for flight crew for helicopter configuration and alignment before landing, avoiding or eliminating the communicated threat. If a threat is not communicated to the flight crew, however the flight crew identifies a threat, communication regarding, or challenge of the HLO shall take place in order to verify the identified threat and develop solutions. Solutions to assure a safe landing could be from rectifying the issue before landing, up to a potential return to base if this cannot be assured in a timely manner.

The following threats, as a minimum, should be part of the documented procedures:

1. Conflicting activities between a landing helicopter and facility operations (e.g. Vessel Operations, Work near Helideck, Crane Operations, etc.)
2. Infringements of the Obstacle Free Sector, Limited Obstacle Sector and Obstacle Free Dropdown Sector

In case of emergency where timeliness of landing the helicopter safely is crucial and the acute threat to helicopter, crew, and passengers outweighs the newly identified threat, the helicopter can be landed at the Pilot in Command's (PIC) discretion.

5.3 Green Deck Procedure

"Green Deck" Procedures part of Checklists used during Flight	*(1.2.1.3)*
Ability for Pilot to Challenge by Radio	*(1.3.1.1)*

"Green Deck" procedures serve to enhance safety by ensuring the landing area is ready to receive the helicopter, and that the correct location has been identified.

Air operators shall document and implement procedures associated with operations to locations that utilize "Green Deck" procedures. These "Green Deck" procedures shall, as a minimum, capture the following elements:

1. Verification of location specific "Green Deck" procedures during the pre-flight planning process (e.g. when landing preapproval is gained by means of a phone call prior to departure), or in-flight procedures (e.g. when landing approval is gained by means of a radio call, light signal or use of Helideck Status Lights).
2. Aircraft in-flight checklist and Normal Operating Procedures shall have specific sections regarding 'Green Deck' procedures.
3. Procedures to be followed when there is a discrepancy between the verbally received status by radio of the helideck and the destination's helideck status lights, or when there is conflict or doubt surrounding the "Green Deck" status.
4. Procedures to be followed in the event of a failure to gain a "Green Deck" prior to landing.

In the event there is a discrepancy between the verbally received status by radio of the helideck and the destination's helideck status lights, and it is not possible for the flight crew to resolve this over the radio, there are two scenarios:

1. The Helideck Status Lights remain ON despite a verbal 'Green Deck', the situation remains potentially hazardous and a Return-To-Base/Alternate shall be performed.
2. The Helideck Status Lights are switched from ON to OFF without having received a verbal 'Green Deck'; a landing may be made at the Pilot in Command's (PIC) discretion.

5.4 Helideck Status Lights

Industry Standard Procedures for Helideck Status Lights	*(1.3.2.1) and (1.3.4.1)*

A Helideck status light is a red flashing light mounted in close proximity to a helideck to provide a visual means of advising a pilot who intends to land at the associated helideck as to the readiness of the deck before landing (safe for landing). This light is intended to be ON anytime the helideck is not considered ready to receive an aircraft, to indicate that the helideck is not considered safe for landing or the helideck team is not prepared to receive the aircraft. Helideck Status Lights and its manual switching also acts as a supplementary means to assist in the reduction of the number of wrong deck landings.

Where Helideck Status lights are installed, no landing should be attempted to a deck with active (flashing) helideck status lights (ON). Air Operators shall document and implement procedures to:

1. incorporate verification that the destination helideck has helideck status lights installed and operating procedures are clear, and
2. confirm that the status lights are switched OFF as a part of their pre-landing checklist before executing the final approach phase of the landing procedure.

When a helideck is equipped with helideck status lights and the flight crew expects the status lights to be ON before requesting a 'Green Deck' and subsequently notices that the Helideck Status Lights are already OFF, this could indicate a failure of the Helideck Status Light System. This potential failure must not be misconstrued as a 'Green Deck' and shall be verified by other means as described in HSAC RP 163 Paragraph 7.5.1.5, such as:

1. Radio communication challenge of HLO 'Green Deck' status (HSAC RP 163 Paragraph 9.3)
2. HLO Hand Held Light Signal
    a. Hand held lights with colored filters below might be used by HLOs in the event of radio communications failure with helicopters or to wave off helicopters that have not been provided a "Green Deck".
    b. Table: HLO Hand Held Light Signals

Light Color	Aircraft in Flight	Aircraft on Helideck
Steady Green	Green Deck	Green Deck
Steady Red	Continue Circling	Stay in Position
Flashing Red	Unsafe, Do Not Land	NA

3. HLO Hand Signal
    a. Standard hand signals to be used by the helideck crew are shown in ICAO ANNEX 2, APPENDIX 1.
    b. At night, these signals shall be supplemented with light wands.

In case of emergency where timeliness of landing the helicopter safely is crucial and obeying a Helideck Status Light that is ON could impair the safe landing, the Pilot in Command (PIC) should assess all available information and determine suitability of the landing area, and execute a landing at his discretion, subsequently executing an emergency shutdown of the aircraft.

Additionally, at a facility, that was previously de-manned where Helideck Status Lights were left ON by departing facility personnel (e.g. Hurricane Evacuation, Platform shut-in, abandonment, etc.); landing is permitted after prior approval by the facility owner/operator.

5.5 Return to Base

100% No Landing and Return to Base Procedure for Hydrocarbon and H2S venting/leaking events	*(5.5.1.3)*
100% No Landing and Return to Base Procedure for Hydrocarbon and H2S venting/leaking events	*(6.3.1.3)*
Pilot Decision to Return to Base	*(2.1.4.4), (4.1.2.5), (4.2.1.8) and (4.1.1.6)*

A return to base is a situation in which the pilot in command (PIC) makes a decision to terminate arrival procedures and returns to the original departure location or a suitable alternate as determined by flight planning.

The Air Operator shall include in their manuals return to base procedures to grant the PIC the ability to make determinations based on several factors, which could be regarding an unsafe condition on the helideck due to environmental conditions, and inability to execute a safe approach and landing, including but not limited to:

1. Hydrocarbon and H_2S venting/leaking is detected or announced by radio or helideck status lights.
2. Evidence of or indication of turbulence on approach sequence.
3. Unknown and unannounced Obstacles around Helicopter Approach Path, or infringing on Obstacle Free Sector, Limited Obstacle Sector and Obstacle Free Dropdown Sector.
4. P/R/H Limits of Air Operator differ from Platform/HMS Setup.

The decision to return to base should always be at the discretion of the PIC, and based on the safe operation of the aircraft. The list above is not all-inclusive and may be expanded by air operators to meet the operational risk identified within their organization. In certain situations, where the temporary issue could be easily resolved, reject the landing and instead of a full return to base, might be able to return for another approach. Communications with the facility will determine if a second landing attempt may be executed upon mitigation, or a return to base shall be performed.

6 AUDITS

6.1 Audit Process

Helicopter Operations Audit *(10.2.1.1) and (12.5.1.1)*

Helicopter operator audits are required in order to determine suitability and competency for providing a safe offshore helicopter service and to assess ongoing contractual compliance. Recommendations for improvements may be made where applicable. Helicopter flight, technical and support operations auditing is a dedicated area that requires trained and proficient auditors.

Air Operators shall have a documented process to conduct periodic helicopter operations audits, to include at a minimum the following elements:

a) **Manifesting.** Assuring accuracy of manifests prepared for all helicopter flights, where actual passenger, baggage and cargo weights are recorded.
b) **Fuel Sampling.** Assuring fuel samples are taken and tested from multiple points (fuel system and helicopter(s)) daily, retained for 24 hours, and presented to flight crew for acceptance prior to refueling.

6.2 Inbound Weight Audit

Weekly inbound Weight Inspections (Re-weigh) at Onshore Heliport *(12.2)*

Weigh-in of passengers, baggage, and equipment shall take place just prior to flight under the supervision of an assigned responsible party in order to assure accurate weights are manifested. Passengers shall be segregated from their baggage and equipment between weigh-in and boarding to prevent potential altering of the actual weights.

Practices sometimes seen at offshore locations are weigh-in the evening prior to flight or an honor system where the passenger writes down the weights without actual weigh-in or supervision. These practices result in inaccurate manifests and can impair safety due to subsequent incorrect weight and balance and center of gravity issues for the helicopter; therefore, these practices shall be abolished.

Inbound Weight Audits are checks performed by the air operator, where upon arrival of offshore passengers, baggage and cargo from an offshore location, the manifested weights (passengers, baggage and cargo) are re-weighed and checked against the documented values on the manifest to assure offshore weigh-in and manifesting processes result in accurate manifests.

Air operators shall document and implement an inbound weight audit process that contains the following elements:

1. An inbound weight audit shall be performed, as a minimum, on at least one inbound flight per month for each of the serviced manned offshore locations.
2. Assuring mandatory compliance with the inbound weight audit by passengers.
3. Document and retain records for at least 6 months for performed inbound weight audits.
4. Communication of findings with the offshore location, in order to improve weigh-in and manifesting processes.

6.3 Line Operations Safety Audit (LOSA)

LOSA/Check Flight Audits adherence to procedure *(1.2.1.4)*

The Line Operations Safety Audit (LOSA) is built upon the notion that the key to safety and improved performance lies in the ongoing monitoring of normal operations and critical reflection on the strengths and weaknesses of current procedures and practices. It is about looking inward—gathering data—and reflecting on the facts. LOSA does not show others whether an air operator complies or conforms, it shows the air operator the strengths and weaknesses of their current procedures and practices.

The Line Operations Safety Audit methodology is an innovative audit process. Data for the LOSA are collected by trained expert observers who undertake non-jeopardy observations of normal line operations—from the flight deck, in the jump seat, and observe and record.

Air Operators should have a documented and implemented LOSA program that is defined by the following operating characteristics:

1. Jump seat observations during normal operations
2. Confidential, and non-punitive data collection
3. Voluntary crew participation
4. Trusted and trained observers
5. Joint management / union sponsorship (if applicable)
6. Systematic observation instrument
7. Secure data collection repository
8. Data verification roundtables
9. Data-derived targets for enhancement
10. Feedback of results to line pilots

As part of the LOSA program, the following shall be checked, as a minimum:

1. Adherence to the "Green Deck" procedures as documented in the Operations Manual.

For Air Operators that do not have a LOSA program, the Line Checks/Base Checks shall include verification of adherence to the "Green Deck" procedures as documented in the Operations Manual.

7 CARGO AND BAGGAGE

Correct Packaging of Cargo and Baggage at Shore Base and on Platform/Vessel (11.3)

Passenger Baggage is personal belongings packed in luggage for traveling to/from an offshore location.

Cargo is defined as any items, not being identified as passenger baggage that is designated to be transported on a helicopter to/from an offshore location.

Dangerous Goods/Hazardous Materials Cargo shall be packaged, labeled, marked, documented, and handled in accordance with 49 CFR Paragraphs 100-185.

Any other cargo shall be packaged to withstand environmental and other relevant conditions associated with air transport, including avoiding loose items to become FOD.

Air Operators and Offshore Helideck Owners/Operator shall document and implement procedures to check adequate packaging of baggage and cargo prior to loading it on the aircraft.

7.1 Passengers

Restrictions Applied to Passenger Baggage Type and Headwear (11.1)

Removable headwear is considered any type of coverings for the head, such as hats, caps, detachable hoods of raincoats, and scarves, etc. Due to downdraft or wind conditions removable headwear may become FOD; therefore restrictions will be applied for this type of headwear in or around operating aircraft (e.g. flight line or offshore helideck).

Air Operators and Offshore Helideck Owners shall document and implement procedures to check that nobody wears removable headwear in or around operating aircraft.

The following types of headwear are the only types allowed to be worn in or around operating aircraft:

1. Flight helmets by flight crew members;
2. Fall protection helmets by maintenance and/or flight line personnel;
3. Knit caps, beanies, etc., only if secured by overhead hearing protection (to prevent FOD), by flight line personnel, maintenance personnel and/or flight crew members;
4. Headwear that is permanently attached to other garments and cannot become FOD (e.g. hoodies).

In the wintertime, when allowed by the individual air operator, passengers could be allowed to wear knit caps or thermal gear inside the aircraft; however, these types of removable headwear should be secured in a garment pocket during transition to/from the aircraft.

8 DOCUMENTATION

8.1 Operations Manual Procedures

8.1.1 Reduce Flight Activity

Reduce Flight Activity *(C4.1.2.5) and (C2.6.2.5)*

Flights to an offshore helideck need a crash fire rescue (CFR) response capability to execute safe helicopter operations, reducing the human and equipment impact of a potential accident with or without fire.

Air Operators shall have procedures in place to verify that CFR capability is available at manned installations, or firefighting capability is available at Normally Unmanned Installations (NUIs) prior to departure, otherwise cancelling the flight(s) until such capability is available.

In case of emergency or situations where a flight to the offshore location is deemed crucial, a risk assessment should be performed. If possible, the number of passengers and crew should be reduced on authorized flight(s).

8.1.2 Helideck Information Plates

Helideck Information Plates *(3.5)*

Historically, obstacle strikes on or around offshore helidecks have contributed significantly to the number of offshore helicopter incidents. Besides minimizing the amount of obstacles near a helicopter landing area and assuring obstacle free sectors and engineering out the potential for obstacle strikes, information about the environment surrounding an offshore landing area is crucial for the situational awareness of flight crew and needs to consist of more than just obstacle information. This is critically important to flight crews so that prior to arrival at the intended offshore landing area, they can be prepared and informed of site-specific hazards and considerations.

HSAC RP 164 describes a template to provide this information in a standardized format called a Helideck Information Plate (HIP) to the flight crews, so they will be better positioned to utilize the information provided as well as maximize their attention to safely operating the aircraft instead of dealing with distractions caused by unexpected facility configurations. Additionally, this concise helideck information in the HIP is considered one of the necessary mitigations to prevent wrong deck landings.

Air Operators shall have a documented and implemented procedure assuring that flight crew are provided with, will review prior to flight, and use during flight planning and flight operations, the helideck information plates (HIPs) for each offshore destination and offshore alternate used in the flight planning process.

When a HIP is not (made) available for an offshore destination or alternate, the air operator shall request a HIP from the helideck owner/operator to assure availability in the future, meanwhile other sources of information (e.g. helideck inspection reports) can be used to identify potential obstacles or hazards

associated with the helideck. Additionally, a High Reconnaissance (see paragraph 5.1) will be required prior to landing at a facility for which a HIP is not available.

8.1.3 Use of Standardized Flight Sheets

Use of Standardized Flight Sheets *(12.3.1.3)*

The means for documenting accurate aircraft weight and balance and center of gravity calculations is an operator's unique responsibility. With mixed fleets (e.g. multi and single engine aircraft) that have differing reporting requirements, operators benefit by having a standardized flight sheet that incorporates load manifest information as defined in 14 CFR § 135.63(C). The load manifest information and other regulatory requirements should be captured on a standardized document to meet the required record keeping guidelines and also be used to mitigate aircraft maximum gross weight exceedances.

Air Operators shall develop and have documented processes in place to use standardized flight sheets for both single and multi-engine helicopter types in their fleet using the requirements outlined in 14 CFR § 135.63(C)(1) through (8), to assure adequate weight and balance and center of gravity information are calculated, documented and kept in a standardized way.

8.2 Industry Engagement

Industry Engagement (HSAC) *(15.2.3.3)*

New and updated equipment, processes and procedures are being developed continuously. For Air Operators and their employees to remain current on these industry developments, engagement in a regional industry forum (e.g. Helicopter Safety Advisory Conference (HSAC)) is recommended.

9 EMERGENCY RESPONSE

9.1 Flight Restrictions

Flight Restrictions *(C1.10.1.2)*

Procedures used by the air operator to reduce or restrict flight operations in the offshore environment in the event emergency search and rescue (SAR) services are unavailable at any time during the flight.

Air operator shall document and implement operational control measures in the event search and rescue services are limited or unavailable during flight operations.

These operational control measures shall include, at a minimum:

1. Notice of limitations in SAR coverage to be communicated to flight crews during preflight planning.
2. If loss or reduction of SAR coverage occurs post launch, the air operator is to inform the flight crew in flight.

Flights conducted without SAR resources and/or other recovery assets as stated in paragraph 10.2 may be authorized following company risk assessment process.

9.2 Standby Vessel

Standby Vessel *(C1.10.1.1)*

Standby vessels are those vessels in the offshore environment operating near the flight destination to provide search and recovery assistance in an emergency scenario.

Air operator shall document and implement procedures to identify the presence of standby vessels near the flight destination and the means to notify flight crews and dispatchers of the status and availability of search and recovery assistance. These vessels may provide immediate assistance in the absence of available airborne search and rescue assets.

The procedures shall include, at a minimum:

1. Means to monitor availability and capability of standby vessels in the area of anticipated service.
2. Means to communicate with offshore assets and flight crews to coordinate and assist in alternate planning.

Should a standby vessel not be available near the flight destination or capable of providing assistance for emergency scenarios, the air operator should have airborne search and rescue services available.

10 FLIGHT FOLLOWING

10.1 Position Reporting

Procedure Radio Position Reporting Every 15 min (C1.4.1.1)

Position Reporting is defined as a flight crew or pilot giving their known location to a flight tracking entity for the purpose of search and rescue. This method will be done manually by radio every 15 minutes or less in situations where satellite based systems are unavailable or unreliable.

Air Operator shall have procedures to conduct position reports at intervals, not to exceed 15 minutes and at the arrival at destination in the event of a satellite flight following system-tracking failure or at the request of the flight tracking entity (Company Operations, NAA, etc.).

Report shall include as a minimum:

1. Aircraft ID/Company Call Sign;
2. Present Position Coordinates;
3. Fuel on Board;
4. Estimated/Actual Time of Arrival (ETA/ATA);
5. Other Pertinent information (if applicable).

If radio communication with flight-tracking entity is impaired, then communication may be reduced to only items 1) and 2) above if:

1. The flight is operating on a company flight plan
2. The pilot has positive two way communications at each arrival and departure

In event of loss of all types of position reporting (Satellite Flight Following and Radio calls) the Air Operator's Emergency Response Plan procedure for 'Overdue Aircraft' shall be started.

10.2 Satellite Flight Following

Satellite Flight Following (C1.4)

Satellite Flight Following is the physical tracking and locating of an aircraft by tail number/call sign, using helicopter installed hardware and a satellite connection, providing position reporting to a company operations cell or government entity for the purpose of search and rescue.

Air operator shall have satellite flight following procedures not to exceed 2-minute position updates with overdue aircraft reporting requirements for all offshore helicopter flights where Satellite Flight Following Services are available in the region.

If Satellite Flight Following services are not available, see Paragraph 10.1.

11 FLIGHT PLANNING

11.1 Alternates and Return To Base Procedures

Planned Alternates/Return to Base Procedures (15.4.4.4)

Planned Alternates / Return To Base Procedures are a clear set of guidelines published by the air operator, establishing procedures for flight planning and en-route guidance should fog or poor visibility prevent safe approach and landing at the offshore destination.

Air operator shall document and implement procedures in the flight planning guidance to ensure IFR flight crews have nominated/identified an alternate destination in accordance with IFR regulatory requirements and company Ops Specs.

Air operator shall include guidance for determining in flight alternate selection or return to base procedures for flight crews incapable of making a safe approach and landing to a helideck due to fog or poor visibility.

Air operator may utilize specific enhanced operational controls (EOC) to ensure flight safety during periods of hazardous or changing weather. Execution of in-flight deviations and changes to flight plan should be captured and monitored through the air operator's flight tracking system.

11.2 Flight Notification

11.2.1 Air Operator Comms/Ops Center procedure to Call Platform/Vessel

Air Operator Comms/Ops Center procedure to Call Platform/Vessel (1.1.3.2)

The Air Operator usually has either a Communications or Operations Center that monitors flight activity and stays in contact with flight crew. This department could function as a relay station between offshore destinations and flight crew if necessary.

If the air operator operates with a Comms/Ops Center, these departments should have direct access to offshore destination contact details and Helideck Information Plates, in order to assist flight crew with their operational needs. The Comms/Ops Center could act as communication relay station for flight crew if necessary, to inform destination platforms/vessels of changed flight plans, where radio communication by the flight crew is not (yet) available.

11.2.2 Air Operator Communicating Flight(s) Prior to Departure

Air Operator Communicating Flight(s) Prior to Departure (1.1.3.1)

As part of the flight planning process, the air operator should communicate the flight schedule to each destination platform/vessel to avoid these destinations being unaware of incoming aircraft. If the platform/vessel has a Helideck Information Plate issued, the contact details should be presented there.

The Air Operator shall have a documented procedure to communicate the flight schedule to each destination platform/vessel.

If, for any reason, the flight schedule is not communicated to a destination prior to a scheduled flight, the 20-minute and 5-minute radio calls made by the flight crew en-route, shall be used as alternative means of communicating the arrival.

11.3 Helideck Limitations List

11.3.1 Implement Helideck Limitations List (HLL) restrictions per Helicopter Type for each flight

Implement Helideck Limitations List (HLL) restrictions per Helicopter Type for each flight	*(6.3.1.2)*
Use of Helidecks Limitations List (HLL) to Dictate Helicopter Type Specific Payload Restrictions	*(5.6)*

The Helideck Limitations List (HLL) produced by the Helideck Certification Agency (HCA)[1] is considered the industry standard for limitations and restrictions that should be applied in certain cases for safety of flight to an offshore helideck. One of these cases is operating in turbulence. HLL Part B Table 2 provides payload restrictions per aircraft type to handle present turbulence issues at an offshore helideck. By reducing the aircraft payload, the safety of flight in turbulent conditions will be improved significantly.

The helideck owner should have conducted a wind tunnel/Computational Fluid Dynamics (CFD) study, which subsequently should have resulted in an identified turbulence sector. The associated mitigation of downloading the aircraft by reduced payloads would be presented to the air operator in the Helideck Information Plate (HIP) or in a (n additional) NOTAM.

The Air Operator shall have a documented procedure to review destination helideck specific turbulence related information and apply associated helicopter type specific restrictions during flight planning for each offshore helicopter flight.

When no restrictions are provided by the helideck owner (e.g. no CFD study was completed, or no restrictions were communicated by HIP or NOTAM) and the Air Operator has identified a turbulent sector through historical experience flying to this particular offshore helideck, the air operator can, after discussion with the helideck owner, use HLL Part B Table 2 for future payload restrictions. The air operator shall have historical data to support the suggested restrictions and can use occurrence reporting, Flight Data Monitoring data, etc. for this purpose.

[1] *http://www.helidecks.org/download%20files/HLL%20-%20Part%20B%20-%20Tables%201%20-%202.pdf*

11.4 Weight & Balance

Helicopter Pilots Make Calculation of Weight and Balance for Each Flight Leg	*(12.3)*
Procedure and Limits in Rotorcraft Flight Manual and Ops Manual	*(12.3.1.2) and (12.4.1.2)*

It is vital to comply with weight and balance limits established for helicopters. Operating above the maximum weight limitation compromises the structural integrity of the helicopter and adversely affects performance. Balance is also critical because, on some fully loaded helicopters, even small center of gravity (CG) deviations can dramatically change a helicopter's handling characteristics. Operating a helicopter that is not within the weight and balance limitations is unsafe.

When determining whether a helicopter is properly loaded, two questions shall be answered:

1. Is the gross weight less than or equal to the maximum allowable gross weight?

2. Is the CG within the allowable CG range, and will it stay within the allowable range throughout the duration of flight including all loading configurations that may be encountered?

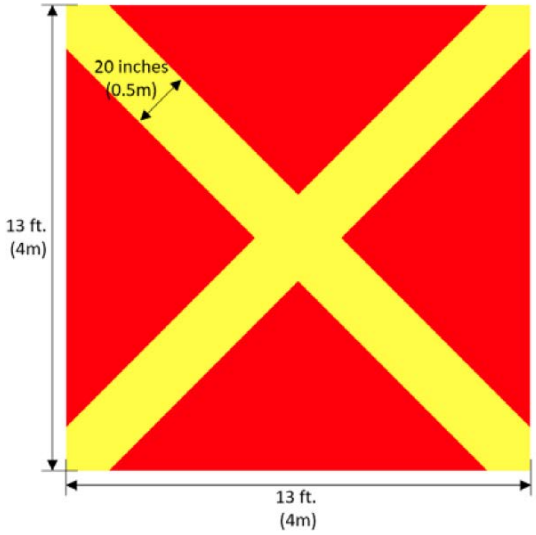
The Air Operator shall have a documented procedure that requires a pilot to calculate the Weight and Balance of the helicopter for each flight leg using the helicopter specific weights and limitations from the RFM for the configuration flown, and actual weights for fuel, passengers, and baggage, assuring that together with environmental factors the helicopter remains within the allowable flight envelope at all times during flight.

12 HELIDECK EQUIPMENT PROCEDURES

12.1 Closed Helidecks

Air Operator OPS Manual Reference for 'Closed' Helidecks (1.4.2.2)

Helidecks can be temporarily, or permanently closed. The duration, time, location, and nature of these (temporary) closings shall be provided to and coordinated with nearby helicopter bases, and helicopter operators supporting the area by the helideck owner/operator. Closing of a helideck is indicated by placing a prohibited landing marker over the "H" and TDPM on the helideck. This prohibited landing marker is made out of vinyl or other durable material. It shall be an "X" on a red background 13 feet (4m) square with the legs of the "X" 20 inches (0.5m) in width. This marker is designed to be quickly secured and removed from the deck using grommets and rope ties. In addition to the prohibited landing marker, the helideck status lights (when installed) shall remain 'ON' (flashing), to indicate the landing area is not safe.



The helideck owner/operator notifies the air operator(s) of the pending (temporary) closure so the Notice to Airmen (NOTAM) system can be activated for the operation and the (temporary) helideck closure.

The Air Operator shall have a documented procedure to prohibit pilots from landing on a helideck where a prohibited landing marker is displayed on the helideck and/or the helideck status lights (if applicable) are 'On' (flashing). Additionally, the pilot initial and recurrent training program shall include the procedures and visuals for both prohibited landing markers and helideck status lights.

12.2 Helideck Blockade

Physical Blockade of Helideck to Prevent Landing (Terrorism) (Crane over Deck) *(1.6)*

In paragraph 13.1 the requirements to close a helideck are depicted; however there could be occasions where a physical blockade of the helideck is needed to prevent landing of a 'hostile' helicopter in case of an imminent terrorist plot potentially endangering the offshore platform. In those cases where the offshore leadership decides to apply a physical blockade, by placing (an) item(s) on the helideck or putting a crane boom over the helideck to prevent a 'rogue' aircraft from landing, this needs to be communicated to the helicopter operators immediately.

The Air Operator shall have a documented procedure to assure pilots visually check the landing area before attempting a landing (see 6.1 High Reconnaissance). Additionally, the procedure where offshore locations can physically block a helideck in case of an imminent terrorism threat shall be incorporated into the initial and recurrent training program.

12.3 Helideck Status Lights

Industry Standard Procedures for Helideck Status Lights *(5.4.3.1)*

Helideck Status Lights are used to indicate an unsafe landing area for helicopters either because the status of the helideck and its environment has not been checked by the helideck team, or because of certain conditions prohibiting the use of the helideck for a longer period of time. Helideck Status Lights should always be turned ON unless and until a Green Deck is provided by the HLO to the arriving/departing helicopter, after which they are turned OFF.

This safety barrier is used to temporarily close the helideck between flights and in those situations when an HLO could potentially open the helideck for helicopter operations following receipt of a standard 20-minute call. If it is anticipated that the helideck cannot be opened up within 20 minutes of receiving a helicopter radio call, the particulars of the situation that prevents the use of the helideck shall be discussed with the installation manager and air operator supporting the installation.

These situations include, but are not limited to: maintenance on or near the helideck, flaring, venting, and other conditions not conducive to helicopter operations. For the duration of the helideck closure a Notice to Airman (NOTAM) shall be issued to ensure the widest dissemination to all helicopter operators and all pilots flying in the area.

The offshore platform shall provide the air operator with appropriate information regarding the helideck closure, and the air operator will then initiate the NOTAM approval and distribution process. In addition to the NOTAM distribution, the Helideck Status Lights will remain ON to indicate the unsafe landing area.

If the temporary helideck closure exceeds two (2) days, then in addition to the procedure stated above, a Prohibited Landing Marker (PLM) (see 13.1) shall be placed over the "H" on the helideck and securely fastened to the helideck. Environmental conditions shall be taken into consideration regarding

how and when the PLM is positioned on the helideck as high winds may interfere with a safe roll-out of the marker by the helideck team.

Upon re-opening the helideck after the temporary closure, the PLM shall be removed, the air operator shall be notified that the NOTAM regarding the helideck closure can be retracted and normal operations regarding the use of the Helideck Status Lights and helideck for helicopter operations are allowed to resume.

The Air Operator shall have a documented procedure for pilots to assure that where red strobe helideck status lights are installed at the edge of the helideck, DO NOT LAND unless lights have been turned OFF. If status lights conflict with the HLO's "green deck" call, to challenge the radio call and DO NOT LAND until the conflict is resolved. If a new unsafe landing status is identified after the "green deck" confirmation, status lights are switched back ON (after initially being switched OFF). When this change is observed, the Pilot Flying shall immediately perform a go-around and request information concerning the status change from the HLO via radio.

12.4 Manual Wave Off

Air Operator OPS Manual Reference for 'Manual Wave off' *(1.5.1.2)*

For different occasions hand signals or light signals are used to relay information to flight crew when radio communications fail. Standard hand signals to be used by the helideck crew are shown in ICAO ANNEX 2, APPENDIX 1. At night, these signals shall be supplemented with light wands. Hand held lights with colored filters may be used by HLOs in the event of radio communications failure with helicopters or to wave off helicopters that have not been provided a "Green Deck". Flight Crew need to know what the different light options mean as depicted in HSAC RP 163 Paragraph 9.9.2.

Air Operators shall have procedures in the Operations Manual explaining the Manual Wave Off Hand- and Light Signals used at offshore helidecks.

12.5 Securing Helicopter

Securing Procedures in Air Operator's Ops Manual *(2.3.1.4)*

Changing environmental conditions could result in unwanted helicopter movement on the helideck; therefore it is necessary for the helicopter to be properly secured while parked, in order to maintain the integrity of both helicopter and offshore installation.

Air Operators shall have documented procedures that require helicopters to be secured while parked at offshore installation helidecks or helideck parking areas.

13 LOADING

13.1 Pilot Supervision

Manifests Produced, Including required documentation per IATA DGR or 49 CFR	*(13.5)*
Pilot Supervision/Verification of Manifested Items during Loading and Subsequent Acceptance	*(13.7)*

The loading of unknown or prohibited Dangerous Goods/Hazardous Materials onto a helicopter introduces unrecognized and potentially significant hazards to the aircraft, its occupants, and their intended destination.

Air operator shall document and implement procedures to check accuracy and content of manifests to ensure any cargo presented for transport by air is permitted to be loaded and carried on the aircraft in the quantity provided. Cargo identified as Dangerous Goods/Hazardous Materials shall be accompanied by the required documentation per IATA DGR or 49 CFR.

When Dangerous Goods/Hazardous Materials are authorized to be loaded and carried on the aircraft, the operator shall document and implement procedures for the acceptance of the materials by the pilot and the subsequent permission for loading of the cargo onto the aircraft. The following shall be part of the procedures:

1. The cargo shipper shall provide advance notice to the operator of the intent to transport Dangerous Goods/Hazardous Materials by air.
2. The air operator will only accept Dangerous Goods/Hazardous Materials for transport by air that are accompanied by the required documentation per IATA DGR or 49 CFR, and are correctly packaged and labelled.
3. Dangerous Goods/Hazardous Materials shall be stored in accordance with the Regulations until the cargo is due to be loaded onto the aircraft.
4. The Pilot in Command is responsible for exercising the duties and responsibilities as specified in IATA DGR or 49 CFR.
5. The cargo packaging shall be inspected immediately prior to loading, and subsequently loaded onto the aircraft in accordance with any associated loading or stowage requirements.

13.1.1 Pilot Cross-Check of Offshore Manifest with Onshore Data Provided

Pilot Cross-Check of Offshore Manifest with Onshore Data Provided Prior to Arrival	*(12.5.1.5)*

Cross-check of a manifest is defined as the process to assure that accuracy and content of the manifest carried by the flight crew from the flight planning process (“Planning Manifest”) is validated against the manifest provided by the offshore helideck team with the actual passenger count and weights, as well as, baggage and cargo (“Flight Manifest”) to be loaded at intermediate locations.

Air operators shall document and implement procedures to ensure crosschecks are performed during the offshore loading process, which shall include the following as a minimum:

1. When offshore Flight Manifests are available prior to departure to that location, these shall be provided to the flight crews as part of the pre-flight planning process.
2. Errors identified in a Flight Manifest prior to arrival or during loading shall be highlighted as soon as possible to allow correction.
3. Errors identified in a Flight Manifest during or after flight shall be reported through the air operator's safety system.

There may be times when crosschecking the manifest prior to departure process is not possible e.g. due to a last minute re-routing, or in an emergency scenario where lack of available time prevents this from occurring. In the event an error in manifesting is identified either inflight or post-flight, the highlighting and reporting process detailed in point 3) above shall be followed.

13.1.2 Pilot Supervision/Intervention During Loading of Helicopter

Pilot Supervision/Intervention	*(13.3.1.4)*
Pilot Supervision/Intervention and Mandatory Reporting To Authorities	*(13.4.1.3)*
Pilot Supervision/Verification Of Manifested Items During Loading	*(12.5.1.4)*

Loading helicopters at an offshore location occurs under the supervision of the helicopter pilot or designee (e.g. flying crew chief), and is in some instances performed by a helideck team (if available). Part of the supervision activities is the observation of the loading process of passengers, baggage and cargo. All should be verified against the provided flight manifest, as much as possible.

Air operators shall document and implement procedures that specify the verification activities during offshore loading of a helicopter by the helicopter pilot or designee (e.g. flying crew chief). These procedures shall include the following as a minimum:

1. Verification of number of passengers, bags, and or cargo against the provided manifest,
2. Verification of labels and packaging of Dangerous Goods/Hazardous Materials manifested.
3. Monitoring of loading for un-manifested items, including undeclared Dangerous Goods/ Hazardous Materials .

In the event of any observed deviations from these requirements these shall be reported in accordance with the applicable reporting guidelines.

14 NIGHT OPERATIONS

14.1 Hazard Risk Management for Emergency Night Flights

Hazard Risk Management Procedure *(15.4.1.4)*

In case of an emergency night flight to a helideck that might not be adequately equipped to handle the flight under the existing night-time conditions, conducting the flight could result in hazards that need to be identified and mitigated or avoided prior to executing the flight.

Air Operators shall have a Hazard Risk Management (HRM) process in place that shall at minimum cover the execution of emergency flights at night to offshore locations that are not adequately equipped to handle those flights.

Where the Air Operator does not have an HRM process in place, a risk assessment and subsequent decision making process should be completed prior to each emergency night time flight to offshore locations that are not adequately equipped.

15 PASSENGER CONTROL

15.1 Passenger Escort

No One Allowed To Approach Helicopter Without Clearance (C3.4)

Rotor blades in motion are hazardous for individuals when in close proximity; therefore, any person near a helicopter shall stay well clear of the rotor system components that are in motion. Control of the area around a helicopter by ground staff can assist in achieving this objective. Other mitigations are passenger safety briefings and safety posters.

Air operators and offshore facility owners shall document and implement procedures to prevent individuals from approaching a rotors turning helicopter, or prevent movement of individuals on the flight line or helideck. Unauthorized individuals shall be escorted at all times.

These procedures shall include the following:

1. Restricting access to flight line or helideck (procedural and physical) to unauthorized individuals.
2. Ensuring passenger control (escorting) on flight line, helideck or around rotors turning helicopter.
3. Providing safety briefings explaining the passenger control procedures and safe approach sectors around a helicopter.
4. Posting safety posters in passenger briefing areas that include safe areas and no-go areas for relevant helicopter types.

Personnel trained on the procedures mentioned above are exempt from being escorted. The following functions could be part of this exemption:

1. Flight crew members
2. Aircraft Maintenance Technicians
3. Ground Support Staff (incl. HLO, HDA and Refueler)
4. Other to be designated by the Air Operator or Facility Owner.

16 PERSONAL PROTECTION EQUIPMENT (PPE)

16.1 Fire Retardant Clothing (FRC)

Fire Retardant Clothing Provides Protection for Limited Time	*(C2.4.2.1)*

Helicopter incidents and accidents could result in a fire hazard threatening the health and safety of helicopter occupants. Flight crew and passengers could significantly benefit from wearing Fire Retardant Clothing (FRC) in situations where fire is present, as it delays the impact of the projected heat for a limited time, providing temporary protection as well as time to evacuate the aircraft.

Air Operators shall ensure flight crew and passengers wear FRC during offshore helicopter flights.

In case of medevac flights where the wearing of FRC by the patient might be detrimental to their physical condition or interfere with treatment, the requirement to wear FRC may be omitted.

16.2 Personal Protective Equipment for Offshore Helicopter Occupants

Pax/Pilot(s) Wear Personnel Locating Beacon (PLB)	*(C1.7)*

Offshore helicopter incidents may result in a ditching of the helicopter, where the possibility exists that helicopter occupants inadvertently end up in the water. In order to increase the survivability of these helicopters' occupants during such an event, the availability and use of Personal Protective Equipment (PPE) is crucial. Personal Locator Beacons (PLBs) for helicopter occupants will increase the chances of safe retrieval by Search-and-Rescue (SAR) assets.

Air Operators shall have documented procedures that assure provision of PPE to offshore helicopter occupants. The following items shall at minimum be part of PPE provided to helicopter occupants:

a. Immersion Suits (if applicable),
b. Life jackets,
c. CA-EBS, and
d. PLBs.

16.2.1 Maintenance and Inspection Program for Pilot and Passenger PPE

Inspection and Maintenance Program CA-EBS	*(C1.8.1.1)*
Inspection and Maintenance Program Immersion Suit	*(C1.9.2.2)*
Inspection and Maintenance Program PLB	*(C1.7.1.1)*

Offshore helicopter flights require certain Personal Protective Equipment (PPE) to be provided to flight crew and passengers. The larger PPE items are Immersion Suits (if applicable), Life jackets, CA-EBS, and PLBs. Where this PPE is provided by the air operator for offshore helicopter flights, serviceability needs to be

assured. The serviceability is rooted in a maintenance and inspection program that is provided by the manufacturer of the PPE.

Air Operators shall have documented procedures that assure serviceable PPE provided to offshore helicopter occupants through a manufacturer endorsed maintenance and periodic inspection program. The maintenance can be performed by third parties, as long as the air operator verifies that the maintenance is performed in accordance with the manufacturer's specifications and intervals by means of audit. The following PPE items shall at minimum be part of the Maintenance and Inspection Program:

e. Immersion Suits (if applicable),
f. Life jackets,
g. CA-EBS, and
h. PLBs.

Note: A best practice used by operators is to batch and assign vests to a specific tail number. Doing so avoids the practice of swapping individual vests from one aircraft to another potentially introducing associated inspection tracking issues. Batching and assigning vests to tail numbers minimizes the potential for a missed inspection or a component time change and simplifies management of life vest compliance processes.

16.2.2 Pre-Flight Check of Pilot and Passenger PPE

Pre-Flight Check	*(C1.7.1.2) and (C1.8.1.2)*
Back-up/Reserve Suits Available	*(C1.9.2.4)*
User Check upon Receipt	*(C1.9.2.3)*

Where PPE as mentioned in paragraph 16.2.1 is provided by the air operator for offshore helicopter flights, serviceability needs to be assured. The last moment this needs to be checked is when the PPE is transferred to the passenger or flight crewmember. This check shall be performed as part of the acceptance procedure and shall be in line with the PPE manufacturer's guidelines.

Air Operators and Facility Owners shall have documented procedures in place to provide passengers and flight crew that will have PPE available for their flight with the knowledge to perform a pre-flight check of serviceability of the provided PPE prior to flight. This can be in the form of a briefing, video, or instructions by the HLO before accepting the PPE. The instructions provided shall be in line with the PPE manufacturer's guidelines. Any discrepancies found shall be remedied or replaced prior to flight.

16.2.3 Pilot- and Peer-To-Peer Checks

Pilot Check	*(C1.6.1.2), (C1.8.2.2) and (C1.9.1.3)*
Peer-To-Peer Check	*(C1.6.1.3), (C1.8.2.3) and (C1.9.1.4)*

Offshore helicopter incidents may result in a ditching of the helicopter (landing on the floats in the water). In order to increase the survivability of the helicopters' occupants during such an event, PPE and life jackets are crucial. Therefore, the wearing of PPE (e.g. hearing protection, CA-EBS (if applicable), etc.), use of seat belts, and correct donning of life jackets (e.g. twists, etc.) need to be verified before take-off. This verification should be two-fold. First, a pilot shall check the helicopter occupants, and second; peer-to-peer checks are advised between passengers and between flight crewmembers.

Air Operators shall document and implement procedures to assure that a pilot will verify the wearing of PPE, use of seat belts and correct donning of life jackets for all helicopter occupants prior to take-off. Additionally, in briefings or videos the air operator shall request the passengers to perform a peer-to-peer check as well before flight. Any discrepancy found during the verification shall be communicated to the PIC and remedied or the take-off shall be postponed until this requirement is satisfied.

17 PRE-FLIGHT CHECKS

17.1 Pax Fitness to Fly

"With Cause" Substance Abuse Testing Carried out Where There is Suspicion of Condition of Passenger	*(14.3)*
Procedures for Transporting Passengers with Altered State of Mind	*(14.1)*

Passenger fitness is crucial for self-egress from a helicopter during an emergency. Transport shall be prohibited for anyone not seeming able to self-egress from the helicopter in case of an emergency, not compliant with the helicopter operator's medical protocol that prevents the passenger from flight on a regular passenger transport helicopter, or acting abnormally or irrationally potentially able to endanger themselves, other occupants or the overall safety of flight, as if under the influence of drugs, alcohol, etc. or in an altered state of mind.

The air operator shall document and implement procedures to require pilots to refuse transport to personnel who do not seem fit to fly to the extent that the safety of the helicopter or its occupants is likely to be endangered, or where a passenger cannot self-egress. The pilot has complete authority to refuse transport.

After risk assessment, certain individuals may be able to be transported on a helicopter if they are physically able to self-egress; however have mental distress or illness. Transportation of these individuals shall only proceed with an assigned escort, with prior medical approval, and the individual shall be seated to avoid endangering the helicopter or its occupants.

17.2 Pax HUET

17.2.1 HUET Training Checked Upon Check-in Before Flight

HUET Training Checked Upon Check-in Before Flight	*(14.2.1.1)*
Restricted Variance Process	*(14.2.1.2)*

Due to the nature of offshore helicopter flights, all passengers shall have completed Helicopter Underwater Egress Training (HUET) within 4 years based on the return travel from an offshore location. Accordingly, the individual will have demonstrated the ability to perform the following functions in case of an emergency egress from the helicopter:

1. Locate the emergency exit window/door
2. Recognize the emergency exit opening mechanism
3. Comprehend the instructions for operating the emergency exit window/door
4. Operate the emergency exit window/door
5. Assess whether opening the emergency exit window/door will increase the hazards to which passengers may be exposed
6. Follow oral directions and hand signals given by flight crew
7. Push out the emergency exit window/door so that it will not impede use of the exit
8. Pass expeditiously through the emergency exit without kicking their feet

NOTE: See HSAC RP 163 Paragraphs 9.12.4.5 and 12.7.

Air Operators shall document and implement procedures to assure that HUET validity for each passenger on an offshore helicopter flight is checked during the check-in process.

The procedures shall include decision authority to deny boarding if a passenger does not meet the HUET requirement and an approved variance with associated mitigation (see below) is not in place.

In certain situations, passengers might not have a current HUET card/certificate. For these occasions, a variance process shall be in place that includes risk assessment, mitigation, and approval by both the passengers company or customer and the air operator. The mitigation should include a video briefing on how to egress a helicopter and the use of the life vest and Emergency Breathing System (if applicable) as a minimum. Additionally, the passenger without valid HUET shall not be seated next to an emergency egress window/door, but be assigned a HUET trained 'buddy' that will be seated between this passenger and the emergency egress window/door. The buddy will have to be willing, able and instructed to act as primary egress person for himself and the assigned passenger.

18 REFUELING PROCEDURES

18.1 Fuel Quality

18.1.1 Marked and Dated Sample Jars Retained

Marked and Dated Sample Jars Retained	*(10.1.1.4) and (10.1.2.1)*
Pilot Option to Request Re-Take Sample	*(10.1.1.5) and (10.1.2.7)*

A Daily Fuel System Inspection is conducted to assure operational readiness of the Fuel System and it will be recorded. Prior to first refueling Fuel Quality shall be confirmed to be acceptable. Daily sump samples shall be tested for water content and particles using the daily checklist to record the results.

NOTE: see HSAC RP 163 Appendix 4 - Attachment 3 – Daily Fuel System Checklist

Fuel samples to be tested shall be pulled from the following locations (onshore and offshore): fuel storage tank sumps, all filters/monitors, and fuel nozzle. Results shall be recorded on the daily checklist. All fuel samples shall be retained for a period of 24 hours in marked, dated, and closed-lid sample jars. Upon refueling a helicopter, the fuel nozzle sample shall be shown to the pilot for acceptance. A new fuel nozzle sample can be requested by the pilot. Where this sample is not provided, the pilot shall challenge the refueler and request the sample.

Air Operators and Facility Owners shall have documented processes, procedures and checklists to assure fuel samples are taken, retained for 24 hours, and fuel nozzle samples shown to the pilot for acceptance prior to starting refueling operations. These procedures shall include the practice to challenge the refueler if no current fuel nozzle sample is provided as part of the pre-refueling process.

18.2 Fuel Quantity

18.2.1 Communications to Shut-Off Fuel Uplift

Communications to Shut-Off Fuel Uplift	*(12.1.1.4)*
Fuel Uplift Amount Cross Check	*(12.1)*
Pilot Monitoring Uplift on Gauges/FMS	*(12.1.1.2)*

Uplifting fuel could result in exceeding the maximum take-off weight of the helicopter; therefore, the requested fuel quantity needs to be calculated correctly, communicated clearly, uplifted amount monitored, and readings crosschecked by both pilot and refueler. Additionally, a process or procedure shall be in place to speak-up when differences are identified, which could result in a potential shutdown of the refueling process.

Air Operators shall have a documented procedure for pilots to determine the correct amount of fuel necessary for the next flight in accordance with minima depicted in their Operations Manual and in accordance with the applicable Rotorcraft Flight Manual.

Air Operators and Facility Owners shall have documented processes and procedures for pilots and/or refuelers that assure two-way communication announcing and confirming the requested fuel quantity, on-going communication between pilot and refueler during refueling to assure the monitored amounts at the refueling station/fuel truck match the fuel gauges/Flight Management System (FMS) in the helicopter (cross-check). Additionally, radio communication or hand signals shall be used to signal a problem during refueling in order to immediately shut off the fuel uplift if necessary.

For single-pilot operations to Normally Unmanned Installations (NUIs) with a fuel station, where the pilot performs the refueling activity, the fuel quantity shown in the helicopter (gauge/FMS) shall be crosschecked and positively confirmed with the fuel cabinet gauge prior to engine start.

19 REPORTING

19.1 Helideck Markings

Degraded/Invisible Markings *(7.3.1.4)*

Certain helideck markings are a visual means to help prevent a landing helicopter to exceed Helideck Design Capability. The allowed size (D-Value) and Max. Allowed Mass are marked on a helideck in a three tiered red/white box if designed in accordance with HSAC RP 161 or 162. Pilots use the information provided by the markings in addition to information from Helideck Information Plates and other documentation to verify that the helideck is able to accept the landing helicopter. Several situations can result in degraded or less visible markings (E.g. lack of maintenance, guano, etc.), therefore degrading the pilot's final means of verification of helideck specifications.

Air Operators shall have documented procedures that require reporting of issues observed with helideck markings within their company and have a feedback loop to the facility owner.

20 TRAINING

20.1 Pilot Training and Competence

Initial/Recurrent Pilot Training + HLO Training: "Green Deck" Procedures	*(1.2.1.2)*
Initial/Recurrent Pilot Training and Competency: Adverse Weather Procedures	*(15.1.1.2)*
Initial/Recurrent Pilot Training: Weather Limits	*(15.1.3.3)*
Initial/Recurrent Pilot Training: Aircraft Securing Procedures	*(2.3.1.2)*
Initial/Recurrent Pilot Training and Competence: Helicopter Max Weight Restrictions	*(12.4.1.1)*
Initial/Recurrent Pilot Training: Helideck Lighting	*(15.2.3.2)*
Initial/Recurrent Pilot Training: Helideck Status Lights	*(1.3.4.2) and (5.4.3.2)*
Initial/Recurrent Pilot Training: Prohibited Landing Marker	*(1.4.2.1)*
Initial/Recurrent Pilot Training: Wave-off Signals	*(1.5.1.1)*
Initial/Recurrent Pilot Training and Competence: Weight and Balance Calculations	*(12.3.1.1)*

Offshore helicopter operations are performed in a complex environment, where processes, procedures, documentation, and proper equipment usage are crucial for safe conduct of those operations. Competence of flight crew members shall include practical knowledge of these processes, procedures, documentation, and equipment usage; therefore certain documented training requirements shall be part of the initial and recurrent curriculum for pilots.

Air Operators shall have a documented initial and recurrent training program in place for all flight crew. The curriculum shall at minimum include the following topics:

a. "Green Deck" Procedures
b. Adverse Weather Procedures and Weather limits
c. Aircraft Securing Procedures
d. Helicopter Maximum Weight Restrictions
e. Helideck Lighting
f. Helideck Status Lights
g. Prohibited Landing Marker
h. Wave-off Signals
i. Weight and Balance Calculations

20.2 Simulator

Simulator Rides include verification of adherence to procedure (1.2.1.5)

Practical application of the processes and procedures taught during the initial and recurrent training program of pilots is crucial and air operators shall use simulator sessions to maintain the practical competency and verify compliance to operator specific procedures during these sessions using Line Oriented Flight Training (LOFT). LOFT is training in a simulator with a complete crew using representative flight segments that contain normal, abnormal, and emergency procedures that may be expected in line operations. An instructor will monitor the crew's performance and review the simulated flight or flights with the crew afterwards to point out errors or good decisions that were made.

Air Operators shall use Line Oriented Flight Training (LOFT) as part of their required simulator curriculum for pilots. The LOFT scenarios shall at minimum include the following:

a. "Green Deck" procedures
b. Stabilized Approach procedures

21 WEATHER

21.1 Alternative reporting due to AWOS communication failure

Alternative Reporting Procedures due to AWOS communication failure *(15.6.2.2)*

Meteorological observations are used for flight planning purposes and to facilitate safe operation of aircraft in the take-off and landing phases of flight. These observations include: direction and speed of the surface wind; horizontal visibility; prevailing weather; atmospheric pressure information; surface temperature and dew point; cloud amounts and height of the cloud base. Accurate, timely and complete meteorological observations are necessary to support safe and efficient air navigation. Automated Weather Observation Systems (AWOS) are widely used to provide this information to flight crew for flight planning and in-flight weather update purposes.

Automated sensors used to measure certain meteorological elements (typically visibility, present weather and cloud) are part of the AWOS system and provide the weather information. When external communications, either by radio or telephone directly from the AWOS is not available, the readings from the sensors will need to be relayed to pilots in an alternative manner, using a separate radio and/or using telephone.

Air Operators shall have documented procedures to handle communication issues associated with Automated Weather Observation Systems, notifying the helideck owner and requesting weather reporting through alternative communication channels, assuring the pilot receives accurate weather information necessary for flight-planning and en-route operations.

21.2 Cold Weather

21.2.1 Cold Water Restrictions for Flying Over Water < 59°F (15°C)

Cold Water Restrictions for Flying Over Water <59F (15C) (No Immersion Suits) (C1.11), (C1.9.1.1) and (C1.9.2.1)

Many aspects of post ditching survival rely on training and procedures that may get helicopter occupants into the water safely. The environment the survivors will now find themselves in may be extremely hostile. Continued survival will depend on the water and air temperature, the wind and sea state, the physical and mental condition of individuals, the clothing worn and the availability of useful survival equipment amongst many other things. Swift location and rescue may well be of crucial importance.

It is essential that in order to survive a water ditching and be rescued successfully, some basic factors must be taken into consideration:

- **Duration of Exposure**. When a person suddenly comes into contact with extremely cold water, they experience a cold shock response. Immediately, the person will hyperventilate and take uncontrollable, deep and fast breaths for the next one to three minutes. If a person goes underwater in this state, he/she could swallow water and drown.
- **Water Temperature.** Survivors of a ditching will not only be unprepared for the sudden exposure to low water temperatures, they are also likely to experience increased body-cooling rates. Survivors are vulnerable to hypothermia which may set in when the core body temperature drops below the minimum temperature required for normal metabolism and bodily functions at approximately 95°F (35°C).

To provide adequate protection, suitable, aviation type and approved, immersion suits should be provided and worn by all passengers and crew, at all times for overwater flights, in offshore helicopters, when:

- The expected rescue time (for all survivors), even in tropical conditions, in sea temperatures of +59°F (+15°C) and above, exceeds the expected survival time;
- The sea temperature is consistently at or below 59°F (+15°C) ;
- The sea temperature is consistently at or below +50°F (+10°C). Additional extra insulation or a suitable Thermal Insulating Garment (TIG) or thermal liners, as well as the suit, should be worn.
- The sea temperature is consistently at or below +41°F (+5°C) or below and when operating over broken ice. Enhanced TIGs, or enhanced immersion suits, may be required to meet the expected rescue time.

In addition, the US Coast Guard (USCG) recommends wet or dry suit use on water if the combined air/water temperature is 120°F (49°C) or less.

Although some of the previous identified scenarios are not likely or sporadic to occur in the U.S. Gulf of Mexico, some cold weather hazard criteria thresholds require actions from air operators:

- Threshold 1: Local surface water temperature at or below 59°F (15°C), and
- Threshold 2: Local combined air/water temperature below 120°F (49°C).

Threshold 1: Water Temperature below 59°F (15°C)

- If possible, the air operator shall plan route around cold water areas and continue flying.
- If flights over cold water areas <59°F (15°C) cannot be avoided:
  - The air operator shall suspend flights from/to affected heliport-offshore location pairs, and
  - Shall convene a Review Team with participation from the air operator organization as well as individual customer organizations to identify essential flights per the table below:

Sea State Does Not Exceed Float Certification Limits		Sea State Exceeds Float Certification Limits
Combined Air/Water Temp between 100°F (38°C) and 120°F (49°C)	Combined Air/Water Temp less than 100°F (38°C)	
• Conduct essential flights. • Put SAR assets on high alert and reposition to optimize response. • Air operators conduct stringent flight following.	Postpone essential flights until combined air/water temp >100°F (38°C) (e.g. until a warmer part of the day)	Cease all flight operations from/to affected heliport-offshore location pair(s).

Threshold 2: Combined Air/Water Temperature below 120°F (49°C)

- For combined air/water temperature <120°F (49°C), passengers and flight crew shall wear appropriate outer garments during flights from/to affected heliport-offshore location pair(s). Passengers not wearing appropriate garments shall be denied transport.

21.3 Flight Planning

21.3.1 Agreement on Pitch, Roll, and Heave (P/R/H) Limits in Use

Agreement on P/R/H Limits in Use *(2.1.4.1)*

Air Operators train their offshore pilots to land on unstable helidecks in accordance with their training program, which is rooted in the Operations Manual procedures for the specific air operator. The mentioned P/R/H limits to which the pilots are trained could differ from the entered P/R/H limits in the offshore vessel/platform Helideck Monitoring System (HMS), potentially resulting in attempted landings outside the ops manual envelope, and training requirements of the air operator's pilots. Agreement, communication, and alignment of HMS limits with the air operator therefore are essential.

Air Operators have documented and implemented procedures to verify and align their ops manual P/R/H limits with any serviced unstable helideck HMS prior to flight.

In other instances where this information has not been captured:

1) Pilots shall request P/R/H information by radio and verify that they are within Ops Manual and training limits prior to landing.
2) When this P/R/H information cannot be provided by radio, the PIC may make a visual assessment of the P/R/H situation and determine if a safe landing can be made.

21.3.2 Air Operator Wind Speed/Crosswind Limits

Air Operator Wind Speed/Crosswind Limits	*(2.4)*
Prevention of Helicopter Repositioning above Certain Wind speeds	*(2.4.2.1)*
Weather Limits in Air Operator's OPS Manual	*(15.1.3.2)*
Air Operator's Comms/OPS Center Monitoring	*(15.1.3.4)*

Crosswind is defined as the component of wind that is blowing across the helicopter heading. To avoid unexpected movement of a helicopter on a helideck, several controls should be effective. Having defined wind speed and crosswind limits for safely operating helicopters are two of these controls that prevent unexpected movement.

Note: The Air Operators Communications/Operations Center can play a pivotal role in assuring the actual weather information, weather limitations, and EOC status is provided to the pilot.

Air Operators shall have documented and implemented procedures to limit helicopter operations in an environment that exceeds the documented wind speed and crosswind limits. Consideration should be given to aircraft type, configuration, and operating environment.

21.3.3 Enhanced Operational Controls (EOCs)

Enhanced Operational Control (EOC) Procedures in Place	*(2.4.1.1) and (15.1.2.2)*
Air Operator Comms/Ops Center Monitoring	*(15.4.2.2)*

Adverse weather or other deteriorated operational conditions, have historically led to incidents and accidents in the offshore helicopter industry. An Enhanced Operational Control Program could prevent associated significant events in the future. The Enhanced Operational Control (EOC) Program should be designed to provide procedures that will assist managers when making risk-based decisions regarding helicopter operations within their area of operation during periods of adverse weather or other operational scenarios that require increased management oversight.

Note: The Air Operators Communications/Operations Center can play a pivotal role in assuring the actual weather information, weather limitations, and EOC status is provided to the pilot.

Air Operators shall have a documented and implemented Enhanced Operational Control Program that should consist of the following elements:

a) Definitions
b) Operational Control process
c) EOC Condition Tiers and associated defined operational restrictions (EOC Matrix) and management/oversight responsibilities
d) EOC Triggering Events and Controls
e) Quick Reference Chart for inclusion in Operations Manual
f) Registration/Documentation process for activation and stand-down of EOC with associated confirmation of conformance with EOC restrictions for each flight executed under the active EOC conditions

21.4 Reporting

21.4.1 HLO Weather Reporting Using Handheld Anemometer

HLO Weather Reporting Using Handheld Anemometer (15.6.1.2)

Manned Offshore Facilities are required to have at least one handheld anemometer that can provide wind direction in degrees magnetic, wind speed in knots, and barometric pressure (QNH). This device can be used as back-up equipment for failing primary wind indication sensors, or can be an addition to pre-landing procedures.

The handheld anemometer can be used by the offshore facility to acquire wind speed, direction, and QNH (altimeter reading) at the center of the 'H' marking on the helideck using a calibrated handheld anemometer. This information can be used in the 5-minute call before arrival to relay actual wind information on the helideck to the pilot of the arriving helicopter.

Air operators shall have documented procedures to assure verification of the use of a handheld anemometer to provide actual wind information from the center of the 'H' marking for each offshore destination helideck utilized, and include challenge procedures in the pre-arrival checklist in case this wind information is not provided during the 5-minute call by the HLO on an equipped facility.

21.4.2 Assuring Accurate Weather Information

Verification of Weather Information by HLO (15.6.1.5)

Air operators shall have documented procedures to assure that accurate weather information is provided by each offshore facility serviced.

21.5 Flight restrictions due to sea state and helicopter float certification

Flight Restrictions When Sea State Exceeds Certification Limits of Floats Installed In Aircraft Type (C1.12)

Survivability of helicopter passengers and crew during an offshore ditching increases significantly if the ditched helicopter does not capsize and stays upright on its floats. The floats installed in each helicopter type have been certificated to a specific sea state to achieve that goal. Advisory material (FAA AC 29-2C) in the certification requirements notes that for a safe landing at sea, "ditching" in a sea state of 4 (four) is assumed. This is therefore also the minimum design requirement for offshore helicopter floats in the United States.

At table with sea states and their individual characteristics is shown below.

Table 1: WMO Sea States

WMO Sea State	Wave Height	Characteristics
0	0 meters (0 ft.)	Calm (glassy)
1	0 to 0.1 meters (0 to 1/3 ft.)	Calm (rippled)
2	0.1 to 0.5 meters (1/3 to 1 2/3 ft.)	Smooth (wavelets)
3	0.5 to 1.25 meters (1 2/3 to 4 ft.)	Slight
4	1.25 to 2.5 meters (4 to 8 ft.)	Moderate
5	2.5 to 4 meters (8 to 13 ft.)	Rough
6	4 to 6 meters (13 to 20 ft.)	Very rough
7	6 to 9 meters (20 to 30 ft.)	High
8	9 to 14 meters (30 to 46 ft.)	Very high
9	Over 14 meters (Over 46 ft.)	Phenomenal

Air operators shall prohibit conducting offshore flights, except in response to an offshore emergency, if the sea state at the offshore location that the helicopter is operating to/from exceeds sea state 6 (six) in order to ensure a good prospect of recovery of survivors. If the certificated ditching performance of the helicopter is less than 6 (six), the sea state at the offshore location that the helicopter is operating to/from shall not exceed the certificated ditching performance of the helicopter and flight operations are prohibited.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